



CIHEAM

# Agri.Med

**Agriculture, fisheries, food and  
sustainable rural development  
in the Mediterranean region**



Annual report  
2006

Centre International de Hautes Etudes Agronomiques Méditerranéennes

***Annual report  
2006***

**Agri.Med**

**Agriculture, fisheries, food and  
sustainable rural development  
in the Mediterranean region**

***Annual report  
2006***

Centre International de Hautes Etudes Agronomiques Méditerranéennes

# CIHEAM

Centre International de Hautes Etudes Agronomiques Méditerranéennes  
*International Centre for Advanced Mediterranean Agronomic Studies*

**Président/ *Chairman* : Mouïñ HAMZE**  
**Secrétaire Général/ *Secretary General* : Bertrand HERVIEU**

11, rue Newton - 75116 PARIS (FRANCE)  
Tel. : +33 (01) 53 23 91 00 - Fax : +33 (01) 53 23 91 01 / 02  
e-mail: lrobert@ciheam.org

---

## IAM

Instituts Agronomiques Méditerranéens  
*Mediterranean Agronomic Institutes*

---

## **Bari - Chania - Montpellier - Zaragoza**

---

### **IAM-Bari**

Directeur : Cosimo LACIRIGNOLA  
Via Ceglie 9  
70010 Valenzano, Bari, Italie  
Tel. : +39 (080) 4606 111  
Fax : +39 (080) 4606 206  
e-mail: masciale@iamb.it

### **IAM-Chania**

Directeur : Alkinoos NIKOLAIDIS  
P.O. Box 85  
73100 Chania, Crete, Greece  
Tel. : +30 (2821) 03 50 00  
Fax : +30 (2821) 03 50 01  
e-mail: alkinoos@maich.gr

### **IAM-Montpellier**

Directeur : Vincent DOLLÉ  
3191, route de Mende  
34093 Montpellier Cedex 5, France  
Tel. : +33 (04) 67 04 60 00  
Fax : +33 (04) 67 54 25 27  
e-mail: sciuto@iamm.fr

### **IAM-Zaragoza**

Directeur : Luis ESTERUELAS  
Apartado 202  
50080 Saragosse, Espagne  
Tel. : +34 (976) 71 60 00  
Fax : +34 (976) 71 60 01  
e-mail: iamz@iamz.ciheam.org

## ***Foreword***

This year the CIHEAM is publishing its eighth annual report entitled *“Agri.Med: Agriculture, fisheries, food and sustainable rural development in the Mediterranean region”*.

- Part I of the present 2006 edition analyses the Mediterranean in the WTO negotiations. Mr. José Maria GARCIA ALVAREZ-COQUE has prepared this section.
- Part II is devoted to the Mediterranean and the cereals issue - geostrategy, trade, and outlook. It contains five chapters: the first is on cereal supplies in the Mediterranean countries - situations and outlook, prepared by Mr. Mahmoud ALLAYA and Ms. Gabrielle RUCHETON, and four chapters cover our case studies on cereals policies in Morocco (by Mr. Akka AIT EL MEKKI), Algeria (by Mr. Foued CHEHAT), Spain (Ms. Alicia LANGREO and Ms. Isabel BENITO), and Turkey (by Mr. Erol ÇAKMAK and Mr. Ozan ERUYGUR).
- Part III presents consumers and the health and environmental quality of products. It has been prepared by Ms. Martine PADILLA, Mr. Rachid HAMIMAZ, Ms. Hiba EL DAHR, Mr. Rami ZURAYK and Mr. Fadi MOUBARAK.
- Part IV covers three country profiles – on Spain (by Mr. Victor D. MARTINEZ GOMEZ), Algeria (by Mr. Slimane BEDRANI) and Egypt (by Mr. Mahmoud Mansour ABD EL-FATTAH).
- Part V presents the main indicators of agricultural and agro-food development in the Mediterranean countries which are members of the CIHEAM. This part has been prepared by Mr. Mahmoud ALLAYA.

The CIHEAM annual report has been drawn up under the supervision of the CIHEAM Secretary-General, Mr. Bertrand HERVIEU. The editorial team of the 2006 edition, coordinated by Mr. Mahmoud ALLAYA (CIHEAM-IAM Montpellier, France), was composed of Mr. Akka AIT EL MEKKI (Ecole Nationale Agronomique, Meknès, Morocco), Mr. José Maria GARCIA ALVAREZ-COQUE (Universidad Politécnica de Valencia, Spain), Mr. Slimane BEDRANI (Institut National Agronomique, Algiers, Algeria), Mr. Erol ÇAKMAK (Middle East Technical University, Ankara, Turkey), Mr. Foued CHEHAT (Institut National Agronomique, Algiers, Algeria), Ms. Alicia LANGREO (Sociedad de Estudios Estrategias Agroalimentarias, Madrid, Spain), Mr. Mahmoud Mansour ABD EL-FATTAH (College of Agriculture, Cairo, Egypt), Mr. Victor D. MARTINEZ GOMEZ (Universidad Politécnica de Valencia, Spain), Ms. Martine PADILLA (CIHEAM-IAM Montpellier, France).

The translation from French into English has been carried out by Ms. Carolyn G. LOANE and the translation from English into French by Ms. Thérèse ZAREMBA-MARTIN; Mr. Mahmoud ALLAYA has been responsible for editing the final version, and Ms. Isabelle DEBABI has been in charge of compilation. The translation from English into Arabic and the final editing of the Arabic version have been supervised by Mr. Mohamed NAWAR (Cairo University, Faculty of Agriculture, Egypt).

Both the full 2006 report and the country reports will be published in electronic format. Please refer to the CIHEAM websites for further information :

<http://www.medobs.org>

&

<http://www.ciheam.org>

# TABLE OF CONTENTS

	page
<b>FOREWORD</b>	<b>i</b>
<b>ACRONYMS AND INITIALS</b>	<b>xxi</b>
<b>PREFACE</b>	<b>xxv</b>
 <b>PART I :     The Mediterranean                   in the WTO negotiations</b> <i>(J.-M. Garcia Alvarez-Coque)</i>	 <b>1</b>
 <b>CHAPTER 1 :   The multilateral trade negotiations and their                   implications for Mediterranean countries</b>	 <b>1</b>
1.1   The Agriculture Agreement and the Mediterranean countries	1
1.2   Groups and positions	4
1.3   Issues and progress	7
1.4   CAP reform and agricultural trade negotiations	15
1.5   Looking ahead: the future of the multilateral trading system	20
1.6   Concluding remarks	23
Appendices	25
 <b>PART II :     The Mediterranean and the cereals issue.                   Geostrategy, trade, outlook</b>	 <b>31</b>
 <b>CHAPTER 2 :   Cereal supplies in the Mediterranean countries:                   situations and outlook</b> <i>(M. Allaya &amp; G. Rucheton)</i>	 <b>31</b>
2.1   Cereals consumption and demand	32
2.2   Cereals production in the Mediterranean region	35
2.3   Trade in cereals in the Mediterranean countries	37
2.4   Outlook	39
Appended tables	43

	page
<b>CHAPTER 3 : Cereals policies in Morocco</b> ( <i>A. Aït El Mekki</i> )	<b>51</b>
3.1 Introduction	51
3.2 Structural data on the cereals industry in Morocco	52
3.3 Historical overview of cereal price policy	60
3.4 Current price policy and trade system	63
3.5 Conclusions and recommendations: what should be the line of cereals policies in the future?	74
Appended tables	77
<b>CHAPTER 4 : Cereals policies in Algeria</b> ( <i>F. Chehat</i> )	<b>83</b>
4.1 Evolution of consumption and demand	83
4.2 The cereal growing and production systems	85
4.3 Market integration of cereal growers	92
4.4 The restructuring of imports according to origin	98
4.5 The consequences for Algeria of the future WTO negotiations on access to the market and production and export support in exporting countries (US, EU, others)	109
<b>CHAPTER 5 : Cereals in Spain</b> ( <i>A. Langreo &amp; I. Benito</i> )	<b>113</b>
5.1 Balance of cereals in Spain	113
5.2 Foreign trade in cereals	118
5.3 Cereals consumption	122
5.4 Cereals production in Spain	125
5.5 The cereals processing industry	134
5.6 The commercial network in the cereals sector	136
5.7 Organisation of the sector	138
5.8 The impact of the CAP reform and outlook	139
<b>CHAPTER 6 : Cereals and related policies in Turkey</b> ( <i>E. Cakmak &amp; O. Eruygur</i> )	<b>143</b>
6.1 Introduction	143
6.2 Agricultural policies and cereals	143
6.3 Area, production, yield and consumption	148
6.4 Prices and comparative support to cereals	167
6.5 Trade in cereals	171
6.6 Conclusion	184
Appendices	187



	page
<b>PART III : Consumers and the health and environmental quality of products</b> <i>(M. Padilla, R. Hamimaz, H. El Dahr, R. Zurayk &amp; F. Moubarak)</i>	<b>195</b>
<b>Introduction</b>	<b>195</b>
<b>CHAPTER 7 : The perception of risks and quality by Mediterranean consumers: elements of debate on the case of Morocco</b>	<b>197</b>
7.1 The challenges of quality and risks in developing countries	198
7.2 Consumers and food risks in Morocco	206
7.3 Food risks and quality marks	216
7.4 Conclusions	219
<b>CHAPTER 8 : The development of products protecting the health and the environment in the Mediterranean region</b>	<b>221</b>
8.1 The health-enhancing food market	221
8.2 The organic and hydroponic product market	230
<b>CHAPTER 9 : Mediterranean consumers and products protecting the health and the environment</b>	<b>247</b>
9.1 Consumer perception and purchasing motives in the Euro-Mediterranean countries	248
9.2 Perception and purchasing motives of (non-European) Mediterranean countries	250
9.3 Consumer perception of hydroponic products	252
9.4 Conclusion	253

	page
<b>PART IV : Country profiles: Spain, Algeria, Egypt</b>	<b>255</b>
<b>CHAPTER 10 : Spain</b> ( <i>V. D. Martinez Gomez</i> )	<b>255</b>
10.1 Agriculture and the Spanish economy	255
10.2 Agricultural and food production, food consumption and trade	260
10.3 Agriculture and agro-food policies	277
<b>CHAPTER 11 : Algeria</b> ( <i>S. Bedrani</i> )	<b>283</b>
11.1 Evolution of the national economy in 2004 and outlook	283
11.2 The context of the global economy and international trade and its implications for the Algerian economy and more specifically for the agricultural sector	287
11.3 Evolution of agricultural aggregates in the economy	287
11.4 Agricultural products	288
11.5 The agro-food industries	292
11.6 Foreign trade and the self-supply rate	293
11.7 The fisheries sector	296
11.8 Evolution of agricultural and rural development policies	299
11.9 Agriculture, natural resources and the environment	304
Appended tables	307
<b>CHAPTER 12 : Egypt</b> ( <i>M. Mansour Abd El-Fattah</i> )	<b>329</b>
12.1 Developments at the macroeconomic policy level	329
12.2 Agricultural resources and agricultural production	333
12.3 Agricultural policies	338
12.4 Production and agricultural income	354
12.5 Agricultural foreign trade	356
12.6 Food consumption	361
12.7 Agricultural and food industries	363
Appendices	365

	page
<b>PART V : Indicators of agricultural and food development</b>	<b>383</b>
<b>CHAPTER 13</b> ( <i>M. Allaya &amp; G. Rucheton</i> )	
13.1 Introduction	383
13.2 Notes on methodology	383
<b>REFERENCES</b>	<b>401</b>

## LIST OF BOXES

page

### PART I

#### Chapter 1

Box 1.1	Mediterranean countries: summary of commitments	3
Box 1.2	Approaches to tariff reduction formulas	13

## LIST OF FIGURES

page

### PART II

#### Chapter 2

Figure 2.1	Cereals consumption in the Mediterranean (kg/capita/annum)	33
Figure 2.2	Share of animal feed in the use of available cereals (%)	34
Figure 2.3	Cereal yields in the Mediterranean region (T/ha)	36
Figure 2.4	Net cereals imports in the Mediterranean region (1000 T)	37
Figure 2.5	Prospects regarding the cereals deficit of Mediterranean countries by 2015 (in 1000 T)	42
Map 2.1	Cereals production in the Mediterranean (1000 T)	35

#### Chapter 3

Figure 3.1	Evolution of the share of the major cereals in total output (1980-2004)	54
Figure 3.2	Evolution of national cereals output and cereals imports (1980-2004)	55
Figure 3.3	Evolution of the prices of the major cereals (1990-2004)	65

#### Chapter 4

Figure 4.1	Algeria: cereals output (1000 T)	88
Figure 4.2	Comparative evolution of the GMP and the world price of common wheat (current DA/T)	96
Figure 4.3	Algeria: cereal imports (1000 T)	107
Figure 4.4	Algeria: cereal imports (US\$ million)	108

	page
<b>Chapter 6</b>	
Figure 6.1	Total harvested area of cereals (million ha) 151
Figure 6.2	Cereal product output (1000 metric tonnes) 152
Figure 6.3	Cereal yields (1961-2004) 155
Figure 6.4A } & 6.4B }	Total harvested areas and cereal product outputs (1961-2004) 158
Figure 6.5	Total cereal production indices (1961-2004) 159
Figure 6.6	Food balance for cereals excluding beer (1961-2002) 164
Figure 6.7	Total cereal consumption and consumption per caput (1961-2002) 165
Figure 6.8A } & 6.8B }	Per capita dietary energy consumption from cereals, and protein and fat consumption from cereals 166
Figure 6.9	Producer prices for cereals (TL at constant prices) 167
Figure 6.10	Total cereal imports and exports (1000 metric tonnes) 172
Figure 6.11	Turkey's total cereal imports by major non-EU countries (1000 metric tonnes) 175
Figure 6.12	Turkey's total cereal imports by major non-EU countries (million US \$) 176
Figure 6.13	Turkey's total cereal imports by country groups (million US \$) 177
Figure 6.14	Turkey's total cereal imports by country groups (1000 metric tonnes) 178
Figure 6.15	Turkey's total cereal exports by country groups (million US \$) 179
Figure 6.16	Turkey's total cereal exports by country groups (1000 metric tonnes) 180

### PART III

#### Chapter 7

Figure 7.1	Evolution of (alert and information) notifications according to product origin 201
Figure 7.2	Evolution of collective food infections (Morocco, 1992-2004) 205
Figure 7.3	Health risks according to level of education 210
Figure 7.4	The products entailing the greatest risks in the opinion of Moroccans (%) 211
Figure 7.5	The products entailing the greatest risks in the opinion of tourists (%) 212
Figure 7.6	Percentage of interviewees against preserving processes or techniques 216

	page
Figure 7.7	The demand for quality marks taking account of the perception of health risks 216
Figure 7.8	The demand for quality marks and food crises 217
Figure 7.9	Food poisoning incidents recorded and Moroccan demand regarding the products requiring quality marks 218
<b>Chapter 8</b>	
Figure 8.1	Ready markets for health-enhancing products. Percentage of world market 224
<b>PART IV</b>	
<b>Chapter 11</b>	
Figure 11.1	Evolution of growth rates in volume 285
Figure 11.2	Self-sufficiency rate for milk and winter cereals 296
<b>PART V</b>	
<b>Chapter 13</b>	
Figure 13.1	Demographic growth (%) 385
Figure 13.2	Economic growth. Annual growth rate of GDP 2004 (%) 387
Figure 13.3	Agriculture in the economy, 2002 388
Figure 13.4	Agricultural labour force (1000 inhabitants) 390
Figure 13.5	External agricultural trade, 2001-2002 (billion \$) 395
Figure 13.6	Self-sufficiency ratios for main food products, 2004 (%) 400

## LIST OF TABLES

page

### PART I

#### Chapter 1

Table 1.1	Country groups and participation of MCs in the WTO	5
Table 1.2	Notified Domestic Support: Amber Box, Blue Box and SDT (million USD)	9

### PART II

#### Chapter 2

Table 2.1	Exports of cereals and edible grain preparations (in \$ million), 2000-2003 average	39
Table 2.2	Prospects regarding cereals supply and demand in the Mediterranean region by 2015	40

#### Chapter 3

Table 3.1	Distribution of the acreage and output of the main cereals by agro-climatic zone (%)	53
Table 3.2	Evolution of the share of imports of the main cereals (%)	56
Table 3.3	Common and durum wheat processed in industrial plants (expressed in 1000 quintals and as a percentage of the total quantity available)	57
Table 3.4	Projections of the production and consumption of the main cereals (1000 quintals)	59
Table 3.5	Marketing of the major cereals in the industrial channel (2000-2004)	68
Table 3.6	The cereal protection system in the multilateral context (2004)	70
Table 3.7	The preferential cereal protection system in the context of the bilateral agreements with the EU and the US	72

#### Chapter 4

Table 4.1	Evolution of cereals output by species (1000 T)	87
Table 4.2	Evolution of cereals output by species from 1962 to 2002 – 5-year averages (T)	89
Table 4.3	Evolution of wheat output and collection	93
Table 4.4	Evolution of the output and collection of secondary cereals	93
Table 4.5	Evolution of producer prices for the three major cereals from 1963 to 2005 (current DA/T)	96
Table 4.6	Evolution of bread and semolina prices since 1989 (DA)	98

	page
Table 4.7	Evolution of total and per capita wheat supply according to origin 99
Table 4.8	Evolution of cereals imports (1000 T) 100
Table 4.9	Evolution of cereals imports (million US\$) 102
Table 4.10	Evolution of semolina and flour imports in grain equivalents (1000 T) 103
Table 4.11	Projections of wheat output, demand and imports from 2003 to 2015 - Scenarios A, B and C 109
<b>Chapter 5</b>	
Table 5.1	Cereals balance (tonnes) 114
Table 5.2	Wheat: Historical series of area, yield, output, value and foreign trade 115
Table 5.3	Barley: Historical series of area, yield, output, value and foreign trade 116
Table 5.4	Maize: Historical series of area, yield, output, value and foreign trade 117
Table 5.5	Rice: Historical series of area, yield, output, value and foreign trade 118
Table 5.6	Wheat: Spanish foreign trade, by country (tonnes) 119
Table 5.7	Maize: Spanish foreign trade, by country (tonnes) 121
Table 5.8	Mixed fodder consumption in Spain (1000 tonnes) – Exclusive of premixes 123
Table 5.9	Share of each type of livestock in fodder destination (%) 123
Table 5.10	Cereals: area, output and value, historical series 125
Table 5.11	Shares of cereals (%), 2002 126
Table 5.12	Cereals: National summary of area, yield and output, 2002 126
Table 5.13	Wheat: Area, yield and output - analysis by province, 2002 127
Table 5.14	Wheat: Analysis by province of area and output according to grain hardness, 2002 128
Table 5.15	Barley: Area and output – analysis by province according to grain hardness, 2002 129
Table 5.16	Maize: Area and output – analysis by province according to grain hardness, 2002 129
Table 5.17	Cereals farms according to production method 130
Table 5.18	Farms whose ETO is “cereals, oleaginous and leguminous plants” 131
<b>Chapter 6</b>	
Table 6.1	Intervention purchases of cereals by the TMO, 1986-2005 147
Table 6.2	Import tariffs on cereals, 2002-05 (%) 147
Table 6.3	Use of Cultivated Area in Turkey (averages of the respective periods) 149
	page



Table 6.4	Field crop areas in Turkey (averages of the respective periods)	149
Table 6.5	Areas and shares by cereal product (period averages)	150
Table 6.6	Yields of selected cereals, 1961-2004	154
Table 6.7	Yield projections for cereal products	160
Table 6.8	Distribution of cereal harvested areas, production and yields (2002)	160
Table 6.9	Regional shares (%) in production (2003)	162
Table 6.10	Producer prices for cereals (\$/metric tonne)	168
Table 6.11	Producer support and transfer to agriculture in Turkey (million US\$)	168
Table 6.12	Indicators of transfers to agriculture (%)	169
Table 6.13	Types of producer support (%)	170
Table 6.14	Commodity-based PSEs, 1986-2004 (%)	170
Table 6.15	Share of market price support in PSE for cereals, 1986-2004 (%)	171
Table 6.16	Cereal import and export shares by country groups (shares of quantity, %)	172
Table 6.17	Turkey's total cereal trade	174
Table 6.18	Total cereal trade unit values for 1991-2002 (US\$/metric tonne)	181
Table 6.19	Turkey's trade in cereal products with World (2002)	182
Table 6.20	Turkey's trade in cereal products with the EU and ROW (2002)	183

### PART III

#### Chapter 7

Table 7.1	Types of contamination and incriminated products (all origins) identified by the rapid alert system (RASFF) of the DG Health and Consumer Protection of the European Commission (2002 to 2005)	200
Table 7.2	Quality control structures in Morocco	204
Table 7.3	Real hazards entailed in the foodstuffs selected (expert opinion)	207
Table 7.4	Moroccan consumers: perception of quality development	208
Table 7.5	Consumer perception compared with expert opinion	213

#### Chapter 8

Table 8.1	Six of the seven food categories registering the highest growth rates at world level in the "health" line	223
Table 8.2	"In my opinion, a healthy diet is the best medicine"	225

	page
Table 8.3	Estimation of per capita health-enhancing food consumption (in 2000) 226
Table 8.4	Description of hydroponic growing systems 233
Table 8.5	Distribution of the use of hydroponic production systems 233
Table 8.6	Summary of organic production in Mediterranean countries 234
Table 8.7	Some data on the organic sector in Cyprus 235
Table 8.8	Hydroponic production area in several Mediterranean countries 240

## PART IV

### Chapter 10

Table 10.1	The Spanish economy. GDP growth. Annual variation (%) (New methodology CNE 2000)	256
Table 10.2	The Spanish Economy. Comparison between the new methodology (CNE 2000) and the previous methodology (CNE 1995). GDP growth in real terms, annual variation (%)	256
Table 10.3	Evolution of the Consumer Price Index (2001=100)	257
Table 10.4	Labour statistics	258
Table 10.5	Economic indicators: GDP growth by production sector (%)	260
Table 10.6	Agricultural structures. Comparison of the 1999 census and the 2003 survey	261
Table 10.7	Number of farms by size and acreage – 1999 census	261
Table 10.8	Land use in Spain (1000 ha)	262
Table 10.9	Acreage (1000 ha)	264
Table 10.10	Evolution of main products 2003-2005	266
Table 10.11	Evolution of animal products, 2002-2004	267
Table 10.12	Farm gate prices, 2002-2004	268
Table 10.13	Price of main inputs, indexes 2002-2004	270
Table 10.14	Gross output of agro-food industry	272
Table 10.15	Number of agro-food industries, 2004	272
Table 10.16	Sub-sectors of agro-food industry: employees and gross production	273
Table 10.17	Total and agricultural external trade, 2003-2004	274
Table 10.18	Agricultural external trade by destination, 2003-2004	275
Table 10.19	Agricultural, fisheries and forestry external trade by category, 2003-2004	275
Table 10.20	EAAGF Guarantee transfers, 2003-2004	280

	page
<b>Chapter 12</b>	
Table 12.1	Macro-economic indicators 331
Table 12.2	The share of the major sectors in the GDP (%) 2001/2002-2003/2004 332
Table 12.3	Percentage of the agricultural sector's contribution to the national economy 2000/2001-2002/2003 332
Table 12.4	GDP growth rate and the agricultural sector (%) 333
Table 12.5	Land and human resources in Egyptian agriculture 334
Table 12.6	Horizontal expansion in Egyptian agriculture 334
Table 12.7	Total water resources and needs of the consumer sectors 337
Table 12.8	Number of employees in the national economy and in the agricultural sector and their productivity throughout 2000/2001-2003/2004 337
Table 12.9	Total investments and agricultural investments (1999/2000-2003/2004) in £E million 340
Table 12.10	Share of the public and the private sectors in agricultural investment in £E million 340
Table 12.11	Value of food subsidies from 2000 to 2004 in £E million 345
Table 12.12	Share of government funds allocated to subsidies in total government expenditure (%) 345
Table 12.13	Loans granted by the PBDAC for investing in various agricultural sectors 348
Table 12.14	Changes in the interest rates for the major agricultural activities 1998/1999-2002/2003 351
Table 12.15	Agricultural economic account, global results in million local currency 355
Table 12.16	The percentage of self-sufficiency for the major food items 356
Table 12.17	Total and agri-exports and imports in million US\$ 358
Table 12.18	Total and agricultural balance of trade 358
Table 12.19	Geographical distribution of exports (value in million US\$) 359
Table 12.20	Geographical distribution of imports (value in million US\$) 359
Table 12.21	Percentage of use of the quotas for the agricultural exports to the EU 361
Table 12.22	Per capita food consumption (2002/2003) in kg 362
Table 12.23	Development of food industries in the private and public sector (quantity-units) – (value-£E million) 363
Table 12.24	Main indicators of the agro-food industries, in the public business sector 2001/2002 – 2002/2003 364

**PART V****Chapter 13**

Table 13.1	Population, demographic growth, urbanisation, agriculture ratio of employment. 2003	384
Table 13.2	Gross domestic product, economic growth, agriculture ratio to the GDP	386
Table 13.3	Cultivated areas. irrigated areas. means of production. 2002	389
Table 13.4	Main agricultural products. 2004	391
Table 13.5	Growth rate of agricultural products. 2004	392
Table 13.6	Food consumption. 2002 (kg/capita /yr)	393
Table 13.7	International trade ratios for agricultural products. 2004	394
Table 13.8	Euro-Mediterranean trade. 2003. All products	396
Table 13.9	Share of Euro-Mediterranean trade in the total trade of each country. 2003	396
Table 13.10	EU agro-food trade with the Mediterranean countries: Exports from the EU to the Mediterranean countries. 2003	397
Table 13.11	EU agro-food trade with the Mediterranean countries: Imports of the EU from the Mediterranean countries. 2003	398
Table 13.12	Self Sufficiency ratios for main food products. 2004	399

## LIST OF APPENDICES

page

### PART I

#### Chapter 1

Annex I	List of members of several groups in Doha Development Round negotiations	25
Annex II	Proposals in which MCs have taken part	26
Annex III	Hong-Kong ministerial declaration (section on agricultural negotiations)	28

### PART II

#### Chapter 2

Table 2.3	Human annual per capita cereals consumption	43
Table 2.4	Total human cereals consumption	43
Table 2.5	Total animal cereals consumption	44
Table 2.6	Total cereals demand	44
Table 2.7	Cereals output in the Mediterranean region	45
Table 2.8	Cereals imports in the Mediterranean region	46
Table 2.9	Net cereals imports in the Mediterranean region	48

#### Chapter 3

Appendix 3.1	Evolution of the major cereals output in Morocco (1000 quintals)	77
Appendix 3.2	Evolution of the output prices of the major cereals in Morocco (dh/quintal)	78
Appendix 3.3	Evolution of cereal imports in Morocco (1000 quintals)	79
Appendix 3.4	CAF prices evolution of the major cereals in Morocco (dh/ql)	80
Appendix 3.5	Evolution of the IPC (consumer price index) in Morocco (1989 = 100)	81

#### Chapter 6

A1	Nuts regions of Turkey (TR)	187
A2	Nuts regions of Turkey at Level 1	188
A3	Map of Turkey (Nuts regions)	189
A4	Agricultural output by sub-sector	190
A5	Turkey's trade in cereal products with EU countries (2002)	191
A6.1	Regional distribution of spelt production (2003)	192
A6.2	Regional distribution of rye production (2003)	192
A6.3	Regional distribution of oats production (2003)	193
A6.4	Regional distribution of mixed grain production (2003)	193
A6.5	Regional distribution of millet production (2003)	194
A6.6	Regional distribution of canary seed production (2003)	194

	page
<b>Chapter 11</b>	
Table 11.1	Algeria - evolution of the major aggregates (value in billion DA) 307
Table 11.2	Employed population and unemployment 308
Table 11.3	Distribution of employment according to the sector of activity of the establishment and stratum (Sept. 2004) 309
Table 11.4	Employment by sector 310
Table 11.5	Agro-food imports and exports 310
Table 11.6	Evolution of foreign trade (imports rounded up to the nearest million US\$) 311
Table 11.7	Evolution of agricultural commodities in 2004 312
Table 11.8	Cereals output (quintals) and yield (quintals) 313
Table 11.9	Acreage, output and yield of artificial and natural fodder 314
Table 11.10	Horticultural output (quintals) 314
Table 11.11	Potato output (quintals) 314
Table 11.12	Industrial crop output 315
Table 11.13	Fruit-tree crop, citrus and vine output (quintals) 315
Table 11.14	Olive output 316
Table 11.15	Date palms: number of trees, output and yield 317
Table 11.16	Forest products 317
Table 11.17	Animal products 317
Table 11.18	Evolution of the main imports in volume and value 318
Table 11.19	Evolution of the import prices of certain commodities 319
Table 11.20	Trade by major economic region (in %) 320
Table 11.21	Evolution of land developed for leasehold 320
Table 11.22	Distribution by cost line provided in the 2005-2009 5-year plan 321
Table 11.23	Self-supply rate 322
Table 11.24	Financing of the agricultural and rural sector (actual expenditure in 10 <sup>6</sup> DA) 324
Table 11.25	Some data on fisheries in Algeria 324
Table 11.26	Balance sheet of the Directorate General for Forestland (1999-2004) 325
Table 11.27	Development of land by leasehold. Situation concerning cumulated projects (since 1999) by ecological zone as at 31-3-2005 327
Table 11.28	Development of land by leasehold. Situation of cumulated projects (since 1999) by management system as at 31-3-2005 327
Table 11.29	Fisheries product imports 328
Table 11.30	Balance of trade in fisheries products 328

	page
<b>Chapter 12</b>	
Appendix (1) Equivalent rates for measurement units	365
Appendix (2) Value of agri production, value in million L.E., 2001-2003	366
Appendix (3) Evaluation of animal production 2001-2002	367
Appendix (4) Data of fisheries 2001-2002	367
Appendix (5) Farm gate prices 2001-2003	368
Appendix (6) Value of main inputs 2001/2003	369
Appendix (7) Food balance sheets for major commodity groups - Egypt, average 1996-2000	370
Appendix (8) Food balance sheets for major commodity groups - Egypt, 2002	371
Appendix (9) Food balance sheets for major commodity groups - Egypt, 2003	372
Appendix (10) Egypt: Area, yield and output of cereal, legumes and fodder crops throughout (2000-2004)	373
Appendix (11) Egypt: Area, yield and output of cash crops throughout (2000/2004)	374
Appendix (12) Development of the area, yield and output of oily crops in A.R.E. throughout (2000/2004)	375
Appendix (13) Egypt: Area, yield and output of vegetable crops in A.R.E throughout (2000/2004)	376
Appendix (14) Development of the area, yield and output of vegetable crops in A.R.E. throughout (2000/2004)	377
Appendix (15) Area, yield and output of fruit crops throughout 2000/2004	378
Appendix (16) Development of the wholesale price and the consumer price for red meat in A.R.E. throughout (2000/2003)	379
Appendix (17) Development of the farm price an the consumer price for the main crops in A.R.E throughout (2000-2003)	380
Appendix (18) Imports of some agricultural items throughout 1999-2004	381
Appendix (19) Exports of some agricultural items throughout (1999-2004)	381
Appendix (20) Indicators of sub-sectors of AFI, in the public sector in Egypt 1999/2000-2002/2003	382

## ACRONYMS AND INITIALS

<b>AAU</b>	Agricultural Area in Use
<b>ACCOE</b>	Spanish association of cereals and oleaginous traders
<b>ACP</b>	African, Caribbean and Pacific countries
<b>ADF</b>	Agricultural Development Fund (Morocco)
<b>AEAC-SV</b>	Spanish association of conservation agriculture (Spain)
<b>AETC</b>	Spanish association of cereals technicians
<b>AFHSE</b>	Flour and semolina producers association of Spain
<b>AFIs</b>	Agro-Food Industries
<b>AFTA</b>	Arab Free Trade Area agreement
<b>AGDP</b>	Agricultural Gross Domestic Product
<b>ALF</b>	Agricultural Labour Force
<b>AMF</b>	Anhydrous milk fat
<b>AMS</b>	Amber box
<b>AoA</b>	Agreement on Agriculture
<b>ARIP</b>	Agricultural Reform Implementation Project (Turkey)
<b>ASAJA</b>	Agrarian association of young farmers (Asociacion Agraria de Jovenes Agricultores) (Spain)
<b>ASAP</b>	Agricultural Structural Adjustment Programmes
<b>ASCUs</b>	Agricultural Sales Cooperatives Unions (Turkey)
<b>ASM</b>	Aggregate Support Measure
<b>CAM</b>	Moroccan agricultural cooperatives
<b>CAP</b>	Common Agricultural Policy
<b>CCAE</b>	Agrarian cooperatives confederations of Spain
<b>CCP</b>	Certification of product conformity
<b>CESFAC</b>	Spanish confederation of animal feed compounders (Confederacion Espanola de Fabricantes de Alimentos Compuestos para Animales)
<b>CIF</b>	Cost Insurance and Freight price
<b>CIMMYT</b>	International maize and wheat improvement center (Turkey)
<b>CNAN</b>	National maritime company (Algeria)
<b>CNE</b>	National statistics institute (Spain)
<b>COAG</b>	Coordination of farmer and stockbreeder organisations (Spain)
<b>Crédit agricole</b>	Agricultural credit bank
<b>CREDOC</b>	Centre de recherche pour l'étude et l'observation des conditions de vie économique et sociale (France)
<b>CSA</b>	French broadcasting regulatory body
<b>CSE</b>	Consumer Support Estimate
<b>CV</b>	Coefficient of Variation
<b>DA</b>	Dinar algérien (Algerian dinar)
<b>DEP</b>	Directorate for surveys and planning (Algeria)
<b>DGF</b>	Directorate General for Forestland (Algeria)
<b>Dh</b>	Dirham (Morocco)
<b>DIS</b>	Direct Income Support
<b>DSAP</b>	Direction des Services d'Appui à la Production (Directorate for production support services) (Algeria)
<b>DSB</b>	Dispute Settlement Body
<b>EAC</b>	Instituted collective farms (Algeria)



<b>EAGGF</b>	European Agricultural Guidance and Guarantee Fund
<b>EAI</b>	Instituted individual farms (Algeria)
<b>EEC</b>	European Economic Community
<b>ENIAL</b>	National food industry enterprise (Algeria)
<b>ESU</b>	European Size Units
<b>ETO</b>	Economic and Technical Orientation for cereals (Spain)
<b>EU</b>	European Union
<b>FAO</b>	United Nations Food and Agriculture Organization
<b>FDI</b>	Foreign Direct Investment
<b>FDRMVTCT</b>	Fund for rural development and the development of land through leasehold (Algeria)
<b>FEFAC</b>	European feed manufacturers' federation
<b>FEGA</b>	Spanish agricultural guarantee fund
<b>FIAB</b>	Food and beverage industries federation (Spain)
<b>FNM</b>	National milling federation (Morocco)
<b>FNMVTC</b>	National fund for developing land by leasehold (Algeria)
<b>FNRDA</b>	National fund for agricultural development (Algeria)
<b>FOSHU</b>	Food of special health use
<b>GDP</b>	Gross Domestic Product
<b>GMO</b>	Genetic Modified Organism
<b>GMP</b>	Guaranteed Minimum producer Price
<b>GSSE</b>	General Services Support Estimate (Turkey)
<b>HASP</b>	Health and Safety Plan
<b>HCPI</b>	Harmonised Consumer Price Index (Spain)
<b>IAM</b>	Institut Agronomique Méditerranéen (Mediterranean Agronomic Institute)
<b>IFOAM</b>	International Federation of Organic Farmers Movements
<b>IMF</b>	International Monetary Fund
<b>INCA</b>	National survey on the food consumption of individuals (France)
<b>INCERHPAN</b>	Wheat, flour and bread interprofessional organisation (Spain)
<b>INE</b>	National statistics institute (Instituto Nacional de Estadística) (Spain)
<b>INSEE</b>	Institut National Statistiques et Etudes Economiques (national institute of statistics and economic studies) (France)
<b>IPC</b>	Indice des Prix à la Consommation (Consumer Price Index)
<b>LDCs</b>	Less Developed Countries
<b>MADR</b>	Ministry of Agriculture and Rural Development (Algeria)
<b>MAFF</b>	Ministry of Agriculture, Fisheries and Food (Spain)
<b>MAMDA</b>	Mutuelle Agricole Marocaine D'Assurance (Moroccan agricultural mutual benefit insurance company)
<b>MAPA</b>	Ministerio de Agricultura, Pesca y Alimentación (Ministry of Agriculture, Fisheries and Food) (Spain)
<b>MCs</b>	Mediterranean Countries
<b>MFN</b>	Most-Favoured Nation
<b>MPMEA</b>	Ministry of small and medium-sized enterprises and craft industry (Algeria)
<b>MPPI</b>	Ministry for Participation and Investment Promotion (Algeria)
<b>MPRH</b>	Ministry of fisheries and fisheries resources (Algeria)
<b>MTR</b>	Mid-Term Review
<b>NAFTA</b>	North American Free Trade Agreement
<b>NFT</b>	Nutrient Film Technique
<b>NGOs</b>	Non-Government Organisations
<b>NPC</b>	Nominal Protection Coefficient

<b>NTCs</b>	Non-Trade Concerns
<b>OAIC</b>	Office Algérien Interprofessionnel des Céréales (Algerian interprofessional agency for cereals)
<b>OCIC</b>	National interprofessional cereals commission (Morocco)
<b>OECD</b>	Organisation for Economic Cooperation and Development
<b>ONH</b>	Tunisian national edible oils board
<b>ONIC</b>	National organism EU/France and UK
<b>ONICL</b>	National interprofessional office for cereals and leguminous plants (Morocco)
<b>OTDS</b>	Overall Trade Distorting Support
<b>PAM</b>	Policy Analysis Matrix
<b>PBDAC</b>	Principal Bank for Development and Agricultural Credit (Egypt)
<b>PDO</b>	Protected Designation of Origin
<b>PNDA</b>	National Agricultural Development Plan (Algeria)
<b>PPABV</b>	Decentralised projects for combating desertification (Algeria)
<b>PPDR</b>	Decentralised rural development projects (Algeria)
<b>PPLCD</b>	Decentralised projects for combating desertification (Algeria)
<b>PRCC</b>	Project for reforming cereals marketing in Morocco
<b>PSE</b>	Producer Support Equivalent
<b>QIZ</b>	Qualified Industrial Zone
<b>R&amp;D</b>	Research and Development
<b>RASFF</b>	Rapid Alert Signal for Food and Feed
<b>SAP</b>	Structural Adjustment Programme
<b>SDT</b>	Special and Differential Treatment
<b>SEAE</b>	Spanish association for organic agriculture (Sociedad Espanola de Agricultura Ecologica)
<b>SEEs</b>	State Economic Enterprises (Turkey)
<b>SFD</b>	Social Fund for Development
<b>SIS</b>	State Institute of Statistics (Turkey)
<b>SME</b>	Small and Medium Enterprises
<b>SONACOS</b>	National seed marketing company (Morocco)
<b>SONATRACH</b>	National oil company (Algeria)
<b>SP</b>	Special Products
<b>STEs</b>	State Trading Enterprises
<b>TMO</b>	Soil products office (Turkey)
<b>UFT</b>	Undersecretariat of Foreign Trade (Turkey)
<b>UGEoba</b>	Union of Growers and Exporters of Organic and Biodynamic Agriculture
<b>UK</b>	United Kingdom
<b>UNCAM</b>	National union of CAM (Moroccan agricultural cooperatives)
<b>UNDP</b>	United Nations Development Programme
<b>UNIDO</b>	United Nations Industries and Development Organisation
<b>UPA</b>	Small farmers' union (Union de Pequenos Agricultores y Ganaderos) (Spain)
<b>UR</b>	Uruguay Round
<b>US</b>	United States
<b>USDA</b>	United States Department of Agriculture
<b>WTO</b>	World Trade Organization
<b>YWU</b>	Year-Work Unit

## ***Preface***

This year the CIHEAM is presenting its eighth economic report on the agro-food situation in the Mediterranean region. We have decided to focus this report on the cereals issue in the Mediterranean with particular regard to production, consumption and trade. We underline that five countries account for over 75% of cereals output in the region; long-term growth in cereals output (over a 40-year period) has been relatively high – from 1.8% to 3% per annum in several countries.

We know that the agro-food balance in the region is negative: with the exception of France, the Mediterranean countries have been net cereal importers for many years. The overall deficit of the Mediterranean region amounts to some 30 million tonnes, the major importers being Spain, Italy, Egypt, Algeria and Morocco.

The phenomenon of massive cereals imports by low-income countries raises the question of how to achieve greater food security, since failure to increase agricultural production or lack of funding for food imports is liable to result in serious problems for the region. Efforts to implement appropriate national policies and to seek international and Euro-Mediterranean cooperation with a view to improving cereals supplies in the Mediterranean region are an absolute imperative and remain the priority.

The purpose of the present report is to provide policy-makers and agro-food professionals, journalists and students with the background information for this debate.

- ✓ Part I presents the Mediterranean in the WTO negotiations so as to place the Mediterranean issue in the context of the globalisation of agricultural trade.
- ✓ Part II presents the cereals issue in the Mediterranean region with an analysis of production, consumption and supplies. Four case studies are included – on Morocco, Algeria, Spain and Turkey – to illustrate the general picture.
- ✓ Part III is devoted to Mediterranean consumers and the emergence of products protecting the health and the environment.
- ✓ Part IV presents three major country syntheses – on Spain, Algeria and Egypt.
- ✓ And Part V contains agro-food development indicators.

I wish to thank our Mediterranean research colleagues for their contributions to this report, which gives a general overview of a question that is decisive for defining and resolving the food security issue in the Mediterranean region.

We are indebted to Mahmoud ALLAYA from the IAM-Montpellier for his work on the general coordination of this 2006 edition, which will be published in French, English, Spanish and Arabic, and we extend to him our sincerest thanks.

**Bertrand HERVIEU**  
**CIHEAM Secretary General**

# **PART I**

## **The Mediterranean in the WTO negotiations**

José Maria GARCIA ALVAREZ-COQUE, ETSIA Universidad Politécnica de Valencia (Spain)

# ***1 The multilateral trade negotiations and their implications for Mediterranean countries***

## **1.1 - The Agriculture Agreement and the Mediterranean countries**

Most countries in the Mediterranean region have shared a strong interest in taking part in the multilateral trading system. This is expressed by (i) the number of Mediterranean Countries (MCs) that took part in the founding of the WTO in 1995 (the EU, Egypt, Israel, Morocco, Slovenia, Tunisia and Turkey); (ii) the list of MCs that joined the organisation after 1995 (Albania, Croatia and Jordan); and (iii) the MCs that are applying for WTO membership (Bosnia and Herzegovina, Lebanon, Serbia and Montenegro, Algeria, Libya and Syria).

The willingness to participate in the WTO reflects a common growth strategy based on an open economy. No government in the region is currently against taking part in the globalisation process. All MCs are taking steps to implement the WTO Agreements at various stages. This includes the WTO Agreement on Agriculture (AoA). Commitments to reduce export subsidies, domestic support and import duties on agricultural products have been seen as significant steps towards reforming agricultural trade. This goal is shared by most countries in the region.

MCs present clear common characteristics. Agricultural systems are heterogeneous in the region, but they share similar patterns of product specialisation where the preponderance of the so-called Mediterranean products (olive oil, wine, fruit and vegetables) is manifest. Farm structures usually have historical links, and structural adjustment remains an unsolved issue in many Mediterranean agricultural areas. Moreover, these countries share environmental problems, mainly related to the pressure on water and the relatively poor soil resource. Mediterranean populations also share common patterns regarding their diet, based on a traditionally healthy combination of food products. Finally, agricultural landscapes are directly linked to a cultural heritage, which is the outcome of many generations of farmers.

In spite of the long list of shared values, MCs have not followed a single approach with regard to integrating their agricultural and rural areas into the world trading system. Differences in domestic and trade policies have been the result of the considerable leeway permitted by the AoA for countries to design their own agricultural policies. This leeway has been interpreted differently by the MCs which are WTO members, and this has resulted in a variety of commitments adopted after the conclusion of the Uruguay Round (UR).

Box 1.1 presents a summary of the commitments undertaken by MCs after the signature of the AoA. Developed MCs (basically the EU and Israel) have chosen to keep their options to grant support to agriculture in the three main negotiating

pillars – namely export subsidies, market access and domestic support. Slovenia and Cyprus are now EU member states.

Domestic support is an area where differences between developing and developed MCs are marked. In the current situation, developed MCs wish to keep the Blue Box (subsidies that require farmers to limit production, see Article 6.5 of the AoA), at least to a certain degree, because they see it as a tool for facilitating transition away from distorting subsidies and preventing high social costs in rural areas.

The rest of the Mediterranean countries which are WTO members have used less generous farm support options. Apart from the EU and Israel, the only country in the region authorised to grant export subsidies is Turkey, but this country has resorted to special safeguards and trade-distorting domestic support beyond the *de minimis* level (10% of the production value for developing countries). Tunisia and Morocco can use some trade-distorting domestic support and special safeguards but no export subsidies. Jordan is not invoking special safeguards or export subsidies and has only kept an option on trade-distorting domestic support. Egypt has no rights beyond the *de minimis* trade-distorting support.

Developing MCs enjoy Special and Differential Treatment (SDT) for a number of AoA provisions. As for domestic support, for example, SDT allows for some flexibility for developing countries to provide trade-distorting support to farmers such as the extension of the *de minimis* clause and the provisions of Article 6.2 of the AoA (they can grant investment and input subsidies that are generally available and are integral parts of development programmes, and they can provide domestic support to help farmers shift away from producing illicit crops). Developing MCs can also subsidise transport and marketing (Article 9.4 of the AoA).

### Box 1.1 - Mediterranean countries: summary of commitments

**WTO members:** Albania (2000), EU, Croatia (2000), Egypt, Jordan (2000), Slovenia, Israel, Morocco, Tunisia, Turkey.

**WTO observers:** Bosnia and Herzegovina, Lebanon, Montenegro, Serbia, Algeria, Libya.

Within the countries around the Mediterranean basin, the commitments undertaken in the Uruguay Round are summarised in the following paragraphs:

#### **Export competition**

**Export subsidies:** Mediterranean countries which can subsidise exports, but only for products on which they have commitments to reduce the subsidies. The number of products is shown in brackets: EU15 (20), Cyprus (9), Israel (6), Turkey (44).

#### **Market access**

**Right to tariff quotas:** 43 WTO members currently have a combined total of 1,425 tariff quotas in their commitments. The numbers in brackets show how many quotas each country has: Croatia (9), EU15 (87), Israel (12), Morocco (18), Slovenia (20), Tunisia (13).

**Right to special safeguards:** 39 WTO members have currently reserved the right to use a combined total of 6 156 special safeguards on agricultural products. The numbers in brackets show how many products are involved: EU (539), Israel (41), Morocco (374), Tunisia (32).

#### **Domestic support**

**Amber Box:** 34 WTO members have commitments to reduce their trade-distorting domestic supports in the Amber Box: Croatia, EU, Israel, Jordan, Morocco, Slovenia, Tunisia.

However, in practice, developing MCs have fewer possibilities of supporting their farming sectors than have developed countries. Having the option to keep the *de minimis* trade-distorting support, the SDT measures and the Green Box policies listed in Annex 2 to the AoA is not sufficiently encouraging when financial resources are scarce. The AgriMed reports in past years have stressed the complaints by some developing MCs that many of the currently permitted subsidies, affordable by richer countries, could cause trade distortion. Among the subsidies under discussion here are the direct payments to producers, including decoupled income support adopted in the implementation of the Agenda 2000's Mid-Term Review (MTR). This has been seen by developing MCs as a sign of the double standard in the interpretation of the world trading system by developed countries. According to this idea, the "playing field" resulting from the UR would be easier for EU farmers than for those living in the rest of the Mediterranean region.

A question which emerges from the accumulated experience of implementation of the UR Agreements is whether the current round of negotiations will replicate the unbalanced trading situation or will instead create some correcting measures. It is



true that rural development appears to be a shared concern by developing and developed countries in the Mediterranean region. This would call for a certain degree of flexibility in order to take better account of non-trade concerns such as environmental protection. However, while the EU countries still have financial resources for funding agricultural and rural policies, despite the progressive cuts in the CAP budget, developing MCs lack budget and can only use border protection to support sensitive and special products. This is why the present debate is developing into a discussion of two major questions (a) the extent to which the current leeway granted by the AoA for domestic and trade policies might be revised; and (b) the extent to which the revised provisions should give differential and more favourable treatment to developing countries in the region.

## **1.2 - Groups and positions**

The current multilateral trade negotiations began under Article 20 of the (AoA). MCs which are WTO members took part in the negotiations aimed at achieving “substantial progressive reductions in support and protection resulting in fundamental reform”. The Doha Declaration (November 2001) confirmed this goal pointing to efforts to “establish a fair and market-oriented trading system” inserted into a comprehensive Development Agenda. After the Cancún deadlock in September 2003 and until March 2004, negotiations were stalled. In July 2004, the situation moved on and a new deal was agreed in Geneva (the ‘July Package’), which included an outline (or “Framework”) to be used to complete the “modalities” on agriculture. It was agreed that the eventual modalities would finally address the three pillars of agricultural reform – domestic support, export competition and market access – in a balanced and equitable manner. While the July Package was useful in preventing the negotiations from sudden failure, many aspects remained to be agreed (see following sections).

The previous section showed that a variety of commitments were made by MCs after the conclusion of the UR. There are still divergences in the present round of WTO negotiations. In the next paragraphs, a review of the main stances defended by MCs is presented with a view to identifying differences and similarities. At the end of the day, the question is whether MCs could adopt a common approach to the last part of the Doha Round and integrate their agricultural sectors into the multilateral trading system.

The high transaction costs involved in such complex negotiations (the WTO has 148 members, and decisions are taken by consensus) have been reduced to some extent through the grouping of countries. In fact, although the multilateral trade negotiations are no longer a matter of a Quad (US, EU, Japan and Canada), the so-called “five interested parties” comprising the US, the EU, Brazil, India and Australia currently constitute the core negotiating group for the Doha Round.

Brazil and India are at the high table as they are leaders of the developing world, and they are deeply involved in this negotiation process.

A number of exporting countries form the Cairns Group, which calls for comprehensive and substantial liberalisation of agricultural trade. However, the emergence of the G-20 (including major actors within the developing world), just before the Cancún Conference, has provided the negotiations with a more balanced picture. Other groupings with significant activity are the G-10 (the so-called 'friends of multifunctionality'), the G-90 (African Union countries plus Asian-Caribbean-Pacific group plus least-developed countries [LDCs]), the countries of the "Cotton Initiative" (Benin, Burkina Faso, Chad, Mali) and the G-33 (vulnerable economies with small farmers).

**Table 1.1 - Country groups and participation of MCs in the WTO**

<b>Group</b>	<b>Main goal</b>	<b>Examples of members</b>	<b>Mediterranean membership</b>
Cairns Group (exporters)	Market access and reduction of domestic support	Australia	No
G-10 (net importers)	Non-trade concerns	Norway, Japan	Israel
G-20 (developing countries)	Reduction of industrial countries' farm subsidies and domestic support; lower focus on market access	Brazil, India and China	Egypt
G-33 (developing countries)	Special products and Special safeguards to support small farmers	Indonesia	Turkey
G-90 (LDCs, African Union & ACP)	Preservation of preferential treatment	Botswana and Mauritius	Morocco, Tunisia and Egypt
European Communities	Preservation of the European Agricultural Model	EU Member States	Spain, Greece, France, Italy, Portugal, Slovenia, Malta, Cyprus
Five Interested Parties	Main parties involved in the WTO agricultural negotiations	EU, US, Brazil, India, and Australia	

Note: Annex I shows a list of groups and their members.

Where are the MCs inserted? Note that membership in a particular group does not prevent a country from taking part in other groups or from disseminating individual opinions. Moreover, some MCs have been joining the EU in the last few years, so their position is embedded in the EU and can now slightly influence that block. Other MCs are still excluded from the multilateral trade negotiations because of their status as non-WTO Members. Despite the existence of negotiating

groups, the analysis of positions in the agricultural negotiations remains complex as shown in the following paragraphs.

- Most developed MCs (Cyprus, France, Greece, Italy, Malta, Portugal, Slovenia and Spain) are part of the European Union, and they have coordinated their position in the WTO with the rest of the EU member states (but do not necessarily share the same view as that of Northern European countries).
- Israel belongs to the G-10, a group of mostly developed countries which attach substantial importance to the role of the agricultural sector in meeting non-trade concerns.
- Egypt takes part in the G-20 group, which played a significant role in the Cancún Conference and devotes effort to the goal of pressing the EU and the US on agricultural liberalisation and the reduction of farm support, although some countries in the group believe that improvement in market access should be more cautious in the poorer countries.
- Turkey is a member of another group, the G-33, led by Indonesia, which focuses on proposals for special and differential treatment for developing countries and special products.
- As for Morocco and Tunisia, they share some of the objectives of the G-20 and the G-33. However, they have only participated in country groupings through the African Union (which also included Egypt) and through the G-90. This is an alliance including most members of the African Union, ACP and LDCs.

The G-90 shares with the G-20 and the G-33 the idea that agriculture plays a crucial role in economic development and poverty alleviation. Like the G-20, the G-90 opposed the attempts in Cancún by the US and the EU to include the so-called Singapore issues – investment, competition policy, transparency in government procurement and trade facilitation – in the Doha Agenda. The most vocal amongst them has been Kenya in the African Group, Uganda or Tanzania on behalf of LDCs and sometimes the Caribbean countries – Guyana or Jamaica. Politically however, many in this group are vulnerable to US and EU pressures since most have some kind of preferential trading arrangement with the US (e.g. the Africa Growth and Opportunity Act) or EU (e.g. Cotonou, Association Agreements) and are dependent on those powers for aid and loans.

In fact, there is currently no clear definition of who the G-90 are and even the EU Commission has not made it clear if the treatment to be granted to the “most vulnerable” economies should include countries such as Morocco, Egypt and Tunisia, which might be considered with less “moral authority” than the LDCs. Since African Mediterranean countries are more developed than LDCs and have signed or are negotiating bilateral agreements with the EU and the US, they don’t have the same opportunities as LDCs to invoke free market access to developed countries’ markets.

In summary, past experience of agricultural negotiations suggests a lack of consensus among MCs in their negotiating strategies with regard to the Doha Agenda. While developed MCs argue the need to ease farm reform through support measures, but of a less distorting nature, developing MCs seem to be resisting farm subsidies in OECD countries. However, Egypt seems to be pressing more on this aspect, while Turkey, Tunisia and Morocco are more cautious with respect to a multilateral opening of their domestic markets. And preference erosion is still a concern in African MCs.

A point in common in the Mediterranean basin is that no country in the region belongs to the Cairns Group and that MCs are far from pushing for a comprehensive liberalisation of agricultural markets. Instead, the issue of sensitive and special products is raised by many countries in the region. All MCs use border measures, to differing degrees, to protect their farming sectors. Most countries in the region have vulnerable agricultural regions. There is a development concern involved in developing MCs and it is related to the fact that a significant part of the labour force lives in rural areas, is often illiterate and cannot possibly be converted overnight to other activities. The highest priority for developing MCs in the agricultural negotiations is to avoid unduly accelerating the pace of the liberalisation of agricultural imports.

Most MCs are under pressure in this respect, but many developing MCs also want to export and therefore would like to see the EU market open up. Moreover, developing MCs are more 'offensive' towards the removal of trade-distorting support in OECD countries. As for the defensive interests, the EU focus is not only on controlling market liberalisation but also on softening the transition to less distorting subsidies, and on keeping the Amber or Blue Box domestic supports.

### **1.3 - Issues and progress**

The reference document for checking the progress of the negotiations is the July 2004 Framework (or, to be more precise, *'Annex A to the 'Doha Work Programme: Decision Adopted by the General Council on 1 August 2004'*). That paper was endorsed by WTO members and, by summer 2005, was representing the '*acquis*' of the agriculture negotiations. The July Framework established overall guidelines for modalities in each one of the three pillars; these guidelines will be specified during the last part of the round. However, a great deal of work had still to be done on the definition of "modalities" for the reform of the AoA to be agreed in the Hong Kong Ministerial Conference planned for December 2005. On many points, the Framework is too general, preventing the WTO members from reaching deadlock

in the agricultural negotiations simply by leaving eventual agreement on specific sections for later<sup>1</sup>.

### **1.3.1 - Domestic support**

The July Framework foresees:

- Substantial reductions in distorting supports. Those countries with higher levels are to make deeper cuts from “bound” rates.
- Amber Box (“final bound total AMS”) supports will also be cut using a tiered formula, so that higher supports have steeper cuts.
- The *de minimis* support will be reduced by an amount to be negotiated.
- Blue Box supports will be capped at 5% of the agricultural production value.
- Reductions in the **overall** level of trade-distorting support – Amber Box, *de minimis* and Blue Box combined – using a “tiered formula” to be designed so that higher levels of support will have steeper cuts. This joint category is called Overall Trade Distorting Support (OTDS).
- The new ceiling for the OTDS at the end of the implementation period will be the lower of the values of trade-distorting support resulting from (i) the overall cut and (ii) the sum of the reductions/caps of the three components.
- Product-specific AMS caps will be developed.
- The criteria for defining supports as Green Box will be reviewed and clarified to ensure that the supports really do not distort trade, or do so minimally. At the same time, the exercise will preserve the basic concepts, principles and effectiveness of the Green Box and will take account of non-trade concerns such as environmental protection and rural development.

The EU has the largest AMS amongst the WTO members, amounting to US\$35.3 billion in 2002, yet this amount is significantly lower than the committed AMS (US\$61 billion). The accession of Slovenia will not change the EU figures significantly. In 2001, Israel had an applied AMS of US\$248.2 million and a committed AMS of US\$586.0 million. Current and committed AMSs are substantially lower in Morocco, Jordan and Tunisia. The latter country reported a figure of zero for non-exempted trade-distorting domestic support in 2001. Tunisia, Morocco and Jordan have the right to Special and Differential Treatment exceptions and will probably keep them after an eventual agreement in the current round.

The proposed discipline regarding the OTDS in the current Round are very significant because they have the potential to exert greater pressure on the actual support provided by individual countries than did the Uruguay Round disciplines. The Uruguay Round only disciplined some of the individual components, and not

---

<sup>1</sup> We discuss the proposals made by the US and the EU in October 2005 in the last section of the present chapter.

the sum of those components. The question is whether to harmonise at the absolute or the relative levels of OTDS. Some small countries, such as Norway and Switzerland, have a high AMS in relation to the value of their domestic agricultural production. However, if measured in absolute terms, the pressure is on the EU, which will probably be situated in the upper tier of the overall trade-distorting domestic support. Japan and the United States would be in a second tier. Other developed countries could be in a third tier, with developing countries in a final tier, in line with the principle of SDT.

However, the Framework recognised the “role of the Blue Box in promoting agricultural reforms”, which can be considered a victory for the EU and a way of gaining time. It is true that, according to the Framework, Blue Box payments should not be larger than €12 billion (this is about 5% of the value of agricultural production for the EU in 2003). However, as discussed in the next section, the recent CAP reforms allow sufficient leeway for the EU to perform new reductions in the AMS, the Blue Box, the *de minimis*, and the OTDS. The key operation in the next seasons, after the Mid-Term Review, will be the conversion of trade-distorting payments into decoupled single payments, which the EU considers to be in the Green Box. From a US perspective there is a clear advantage in expanding the Blue Box definition to include its Counter-Cyclical Payments (these are made on “fixed and unchanging” areas or number of animals). Otherwise they would have to be accommodated within the total AMS ceiling. At 5% of the value of production, the separate Blue Box provision adds an additional \$9.5 billion of support entitlement for the United States (IPC, 2005).

**Table 1.2 - Notified domestic support: Amber Box, Blue Box and SDT (million US\$)**

	Year	AMS applied	AMS bound	Special Differential Treatment	Blue Box
EU	2001/2002	35 710.3	61 053.6		21 569.0
Slovenia	2003	11.7	56.2		39.5
Tunisia	2001	0.0	43.1	60.5	
Israel	2001	248.2	585.9		
Morocco	2002	24.7	64.1	129.9	
Jordan	2002	1.0	2.0	0.6	

Source: Submissions by WTO members and author's presentation.

The rest of the MCs which have kept some AMS support have undertaken significant cuts on applied AMS (see Table 1). This means that further reductions on bound AMS will probably not involve constraints. All developing MCs will be affected by the *de minimis* or, given their absolute levels of Final Bound Total AMS, would seem to fall into any of the lowest tiers. Furthermore, the Framework

establishes that developing countries will be allowed gentler cuts over longer periods and will continue to be allowed exemptions under Article 6.2 of the AoA. Moreover, the *de minimis* will be reduced by an amount to be negotiated, with special treatment for developing countries, which will be exempt if they “allocate almost all *de minimis* support to subsistence and resource-poor farmers”. According to the G-20 proposal, developing countries without AMS entitlements (such as Egypt) should not be obliged to make cuts.

Most developing MCs want current negotiations to involve stricter control of developed countries' subsidisation, which also affects the Green Box. However, once it has been shown that Green Box support is minimally distorting, there could be a consensus of interests among the countries of the Northern and Southern shores of the Mediterranean:

- Southern MCs would like to introduce provisions which take account of the types of programmes suited to the realities of their poor rural areas and which could stand the fundamental test of, at most, minimal trade-distorting support.
- Northern developed countries, basically the EU, have embarked on far-reaching reform of coupled support policies and are deeply concerned that any change in the existing language might have the perverse effect of undermining their reforms.

Whether the Green Box is an example of the EU's “double standard” or an “appropriate avenue for policies, targeted at their social, political and other non-trade concerns” will continue to be a question for future discussion. It seems that constraints on the Amber Box, Blue Box and *de minimis* in developed economies will add arguments in favour of developing countries' accepting the Green Box as a guideline for agricultural policies in the coming years. We elaborate on this issue at the end of this chapter.

### **1.3.2 - Export competition**

As for **export competition**, the Framework includes an agreed target for this pillar: elimination of export subsidies by a ‘credible’ date. The Framework Agreement refers to “all forms of export subsidies” which means parallel elimination of the subsidy component of government-supported export credit (with the phasing-out of credits and insurance of over 180 days), food aid, and State-sanctioned exporting monopolies. The negotiations will also develop disciplines on all export measures whose effects are equivalent to subsidies. The final stage of the negotiations has to finalise the identification of policies with equivalent effect within the scope of export credits with repayment terms of 180 days or below, certain types of Food Aid, and certain practices of exporting State Trading Enterprises (STEs).

Within the WTO membership, the EU accounts for 92% of export subsidies in value, with an expenditure of \$29.3 billion over the 1995–2000 period. However,

in 2000-2001, the EU granted export subsidies by €2.6 billion, well below the value committed of €7.5 billion. The value ceilings for export subsidies have not involved constraints for the EU. By contrast, quantity bindings have involved more constraints for export flows for certain products (rice, poultry, eggs, pork, fruit and vegetables and dairy products).

On the offensive side, the EU focuses on other types of export subsidies. This will hardly affect most MCs, with the exception of Israel and Turkey, but export subsidy elimination can take longer for Turkey as a developing country. The remaining developing MCs will be entitled to subsidise transport and marketing (Article 9.4 of the AoA) “for a reasonable period, to be negotiated”, beyond the date for ending the main subsidies.

Another issue concerning export subsidies for some MCs can be the operating methods of exporting STEs. In fact, discussions are looking at the conditions for preventing State trading activities from being used to circumvent commitments on export subsidies. This could bring stronger monitoring of institutions such as the Tunisian National Edible Oils Board (ONH) which was created and is maintained to guarantee a minimum income to olive oil producers, a sector of great social and economic importance to Tunisia. However, according to the Framework, STEs in developing countries will enjoy special provisions to preserve domestic price stability.

### **1.3.3 - Market access**

The July Framework commits members to “substantial improvements in market access for all products” by developing a “single approach”: everyone except least-developed countries has to contribute by improving market access for all products. This means that all WTO members in the Mediterranean region will have to make concessions in this pillar.

The Framework refers to tariff reductions that are subject to two principles: (a) ‘progressiveness’, that is, deeper cuts in higher tariffs; and (b) flexibility, to address “sensitive products” and “special products” based on the criteria of ‘food security, livelihood security and rural development needs’.

Market access seems to be the most sensitive pillar. While concessions in the first two pillars will mainly affect industrial economies, in particular the EU and the US, the market access pillar affects everyone, with the probable exception of LDCs. Immediately after the July Framework, progress in the negotiation was needed on: (a) the type of tariff reduction formula that would produce “substantial improvements in market access”, with a progressive approach; (b) how all countries’ sensitive products can be treated and how developing countries can be given further flexibility for their “special products” and be able to use “special safeguard” actions to deal with surges in imports or falls in prices; and (c) how to



deal with conflicting interests among developing countries over preferential access to developed countries' markets.

The choice of formulas for tariff reductions is critical to the ambition of the Round (see Box 1.2). Many countries maintain bound tariffs high above applied tariffs. Because tariff cuts in the WTO are made from bound levels, substantial tariff cuts will be needed in order to have any impact on trade. The basic idea derived from the Framework is that developed and developing countries' tariff lines would be divided into different sets of tariff bands according to the level of duties currently levied, with each band subject to different percentage cuts. For developing countries, the percentage cuts for each of the bands would be smaller – less than two thirds of what developed countries would make in comparable bands. As for the method of tariff reduction, the US and agricultural exporters have generally preferred using a harmonising "Swiss formula" for the cuts, which would cut higher tariffs more steeply even within each tariff band. However, there is an increasing consensus on the use of linear cuts of progressively higher percentages for each band, or the "tiered approach". The actual percentages of reduction are left for negotiation.

As for the flexibility instruments contained in the Framework, the first concerns all countries, which may designate 'an appropriate number' of sensitive products to which the reduction formula will not apply, although tariff cuts will still be required, and market access must be improved through tariff-quota expansion. While this provision responds mainly to the concerns of the G-10 group, it will also benefit highly protected sectors, such as sugar, in the EU. If one assumes that products with tariffs above 100% are "sensitive", then the European Union may claim that more than 5% of the total tariff lines should be considered sensitive products.

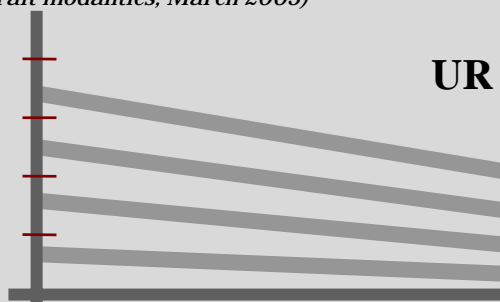
A short paragraph on least-developed countries says that they will not have to make reduction commitments. Developed countries should provide duty-free and quota-free market access for LDCs' exports, and so should developing countries "in a position to do so".

A second element, which is of interest for developed and developing countries, concerns the special safeguard mechanism. While its continuation for developed countries remains under negotiation, the Framework introduces its use by developing countries.

### Box 1.2 - Approaches to tariff reduction formulas

These are simplified visualisations of the various approaches, presented here **merely symbolically** to give an idea of the difference between the approaches. Each line represents a hypothetical cut from a single representative starting tariff. In reality there are a range of starting tariffs in each category.

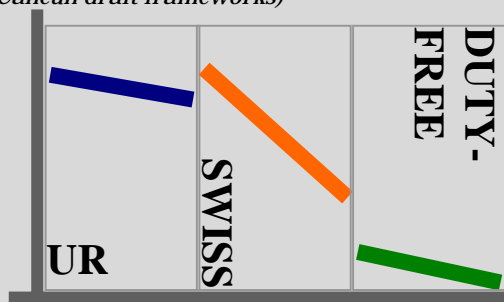
*'Banded approach' (draft modalities, March 2003)*



**Products categorised by height of starting tariff.**

Higher bands: steeper cuts. In the March 2003 draft modalities, the formulas in each band use the Uruguay Round (UR) approach (average cuts subject to minimums).

*'Blended approach' (Cancún draft frameworks)*

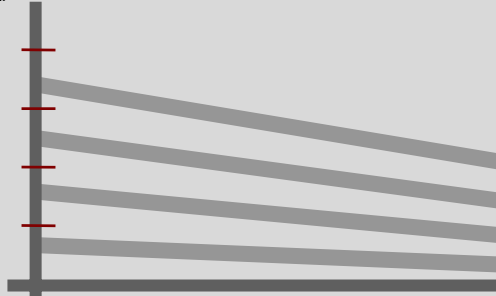


**Products categorised by sensitivity.**

Used in the Cancún draft frameworks, the approach "blends" three formulas. A Uruguay Round approach applies to one category, a Swiss formula to another, and a third is duty-free.

### Box 1.2 (contd.)

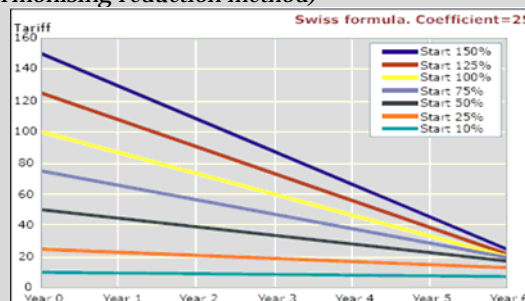
#### *'Tiered approach' (July Framework)*



#### **Products categorised by height of starting tariff.**

Higher tiers (or bands): steeper cuts. Type of formula and number of tiers? This is still to be negotiated in the framework.

#### *'Swiss Formula' (Harmonising reduction method)*



#### **Steeper cuts for higher tariffs.**

The Swiss formula is a special kind of harmonising method. It uses one single mathematical formula to produce:

- a narrow range of final tariff rates from a wide set of initial tariffs
- a maximum final rate, no matter how high the original tariff was.

Source: WTO (2004): "WTO Agriculture negotiations. The issues and where we are now", 1 December 2004.

The third instrument is the SDT measure that will allow developing countries to designate 'an appropriate number' of Special Products (SPs), based on criteria of food security, livelihood security and rural development needs. The criteria and treatment of these products will be specified through negotiations, which are likely to centre on the number of products (which the G-33 group of developing countries says should be self-selected) and whether any tariff cuts will be required.

The G-33 developing country proponents of SP status are working on indicators for such products. However, certain developing countries with export interests express concern that reduced liberalisation for SPs could dampen South-South trade.

While convergence on the issue of the subsidy removal in the EU is relatively easy to achieve among developing MCs, it is more difficult when it comes to the question of which countries' markets will be targeted for tariff reduction and which can be protected. Most developing MCs will probably argue in favour of exemptions from agricultural tariff reductions, while this position will not be followed by most countries in the G-20 group. This will probably weaken the position of developing countries in the final part of the negotiating round.

The Framework establishes that tariff negotiations will also address the erosion of trade preferences due to MFN liberalisation, although there is no guideline for how this is to be tackled. Some countries in the G-20 doubt whether preferences are truly beneficial because they encourage small countries to be dependent on a reduced number of uncompetitive products, discourage diversification and prevent other countries from supplying those products. According to this argument, the countries currently depending on preferences would be better off if major markets liberalised and eliminated subsidies.

The progress in the negotiations for intra-Arab integration and the signature of bilateral agreements with the US can be considered as a tactical response of MCs to the lack of progress in the Euro-Mediterranean Associations as well as to the timid steps taken by the multilateral system towards agricultural liberalisation. Failure in multilateral negotiations will open the door to regionalism, as discussed below.

Regionalism would present certain advantages if it were seen as "deep integration". This would happen in the case where regional integration arrangements offered a mechanism for harmonisation of regulatory regimes and administrative procedures and also involved transfers from the "richer" partners to the "poorer". However, the regional approach presents the problem of a hub-and-spoke pattern where a number of small countries seek bilateral agreements with a large one and the bargaining power lies with the hub.

## **1.4 - CAP reform and agricultural trade negotiations**

### ***1.4.1 - Decoupling support***

The two influential powers, the US and the EU, appear to be quite reluctant to eliminate domestic support for agriculture. In the EU, the CAP has moved slowly along three lines. First, income support has increasingly relied on direct payments with less emphasis on market intervention. Secondly, EU agriculture is now significantly more open to foreign competition than it was in the past, although

border protection remains relatively high for certain products. Thirdly, farm support is more dependent on compliance with modern social demands related to quality, food safety and environmental concerns. The MacSharry Reform and the Agenda 2000 constituted major milestones along this path of reform. The package adopted by the Council of Ministers in June 2003 maintains the same orientations. This reform is widely known as the MTR of the Agenda 2000 and was discussed in the 2004 AgriMed report.

The MTR is managing an apparently new policy instrument known as “single-payment”, which is supposed to be “decoupled” from production. One point of discussion is the actual meaning of ‘decoupling’ and its influence on trade. Within the MTR framework, decoupling involves the conversion of direct payments under the different schemes into a single farm payment, which is kept constant over time and is not dependent on land allocation to various crops.

One of the aims of the MTR is to reduce production that is carried out merely in order to ‘harvest’ a subsidy. In theory this should reduce the amount of produce coming from European farms which either has to be protected from cheaper imports or is likely to be dumped on world markets, with export subsidies. Decoupling means that income support will depend less on price interventions; from the political point of view, this opens the door, to the further opening of the EU markets to foreign competition. Thus, the EU aims to obtain international recognition for its decoupled payments as Green Box payments, that is to say, as public budget transfers which are not restricted by the WTO rules. Public budget expenditure through ‘apparently’ decoupled payments is the means chosen by the EU and the US to facilitate transition to a more open agricultural market.

However, several remarks can be made regarding the EU decoupling concept. First, decoupling has been only partial, and some products (e.g. durum wheat and rice) will continue to receive specific crop payments. Second, EU member states will be allowed to maintain a certain percentage of the current direct payments (that is to say, the Agenda 2000 payments) as specific payments linked to production until 2007. This was defended by certain member states which were afraid of possible land abandonment impacts as a result of full decoupling. Third, it is not clear to what extent the new single payments will be recognised by other WTO members as a convincing shift from the Blue Box to the Green Box. As a matter of fact, the full direct payments will stabilise an unbalanced pattern of income support not only within EU territories but also between the EU and third countries, which do not have the same financial possibilities for funding such payments. In a sense, the globalisation process is pushing for greater integration of the agro-food markets, but the playing field is far from level. The CAP reform will not correct the current international asymmetries in the levels of agricultural support.

A line of argument that has frequently been used in favour of direct payments in the EU is that they can address non-trade concerns (NTCs), such as preservation of the landscape, the environment, and other cultural aspects linked to agricultural

activities. Direct payments are at the core of the CAP, which officially aims to preserve the European agricultural model. But links between the new single payment and NTCs are not clear. It is true that requirements to be met by farmers in order to collect these payments are increasingly linked to environmental and land use conditions (cross-compliance). But the single payment is more likely to be an income support measure rather than a rural policy specifically targeted at NTCs.

### ***1.4.2 - National constraints on CAP reform***

Experience in the Agenda 2000 negotiations on CAP reform suggests that international factors were powerful enough to exert real pressure for reform. In the MTR negotiations, international pressures appear to have increased their influence on CAP reform. However, national interests appear to remain a major obstacle to far-reaching CAP reform towards non-trade-distorting methods of agricultural support.

An appropriate approach for understanding policy-making in the CAP might be to consider the interaction between the Commission, as an 'entrepreneurial leader', and the national preferences reflected in the Council of Ministers. Widespread concern over food quality and safety as well as environmental concerns currently appear to be shifting the Commission's focus away from farmers' interests to more general interests reflected in the 'rural development' approach. Non-agricultural interests are allowing the Commission to play its role in maintaining the initiative for the promotion of CAP reforms. However, national interests may exert influence which slows down the rate of reforms. Thus, the maintaining of agricultural support is a probable scenario in each reform because some countries, such as France, have chosen to advocate it and other countries, such as the United Kingdom (UK), have chosen not to prioritise the reform of this support, even if they are in favour of it. In other words, reform opponents assign a higher priority to the CAP than reform supporters. It is also clear that the way vested interests affect the CAP process varies from one country to another. In the countries that prioritise the CAP the official vote of their Ministry in the Council appears to reflect the national interest. In other countries with less interest in the CAP, national interests generally influence the Commission directly through farmers' unions or non-agricultural lobbies. The direction and speed of the reform process must come from changes in the national policy preferences of key member states.

In recent years, several EU member states including Denmark, Sweden and the UK (and more recently Germany and the Netherlands) have been advocating agricultural reform. The opposite stance has been adopted by France and Ireland, normally followed by Austria, Belgium, Luxembourg, Greece, Portugal and Spain. The Italian position has more in common with the last group of countries but has had its own typical proposals over the past few years, often concentrating on food quality issues or asking for a "southern" shift for the CAP. This variety of national interests has led to much inertia in the CAP.

Three dominant forces explain reluctance to effect agricultural reform in the EU. The first factor is the typical significance attached to agriculture, which has been largely considered essential for the European farming model. It is also connected with the international trade negotiations, where not only an efficient agricultural policy is at stake but also an independent agricultural policy is pursued, protected from US interference. A second pressure comes from the financial benefits received by some member states from the EAGGF funds. While agricultural policy is expensive for European taxpayers, the significant weight of agriculture in some members states means a large amount of transfers from Brussels and a positive net financial balance. And the final factor concerns the scepticism regarding the ability of the market system to provide an efficient allocation of resources to the farming sector.

By contrast, the UK has generally been in favour of the Commission's proposals for CAP reform, except for the introduction of ceilings on direct payments, which is not surprising given the greater average size of British farms. Full decoupling and the establishment of a system for agro-environmental and rural development policies have been advocated by the British government and parliament. In the British view, the Commission's proposals address the requirements arising from the WTO round. This is supported by the attitude of the non-farming population, which is generally sceptical of agricultural support. Moreover, there is growing pressure regarding the impact of farming activities on the environment and animal welfare.

German preferences in relation to CAP reform have also shifted in recent years. Traditionally, German policy on the CAP has been in favour of farm support through high prices, which is consistent with the inefficient farm structures characterising the German farming sector, at least before unification. The core of the conflict for Germany has been the contradiction between the necessary cut in the agricultural budget (likely to grow after Enlargement) and the continuation of high levels of farm support. The intention of the German government to improve the net financial balance in the EU has given support to proponents of a far-reaching CAP reform in Germany. Under a Green Party farm minister, Germany has become a strong advocate of environmental protection, organic farming and animal welfare. This involves a positive attitude to second pillar policies. Since Germany has departed from the reluctance to shift away from the status quo (which was also observed during the Agenda 2000 discussions), the balance of the three models quoted has been a more favourable setting for CAP reform. This has allowed the Commission to take a certain degree of initiative for the MTR proposals, which included decoupling and modulation of direct payments.

In the present restrictive budgetary framework, the German government has favoured partial renationalisation of agricultural subsidies. The UK, Sweden and the Netherlands, amongst others, appear more willing to favour the progressive removal of the CAP subsidies and the integration of agricultural policies into their own rural development strategies. However, southern European member states are not very keen to accept a radical CAP shift to rural development projects, because

these countries would probably have to co-finance a significant proportion of the projects. France's position seems to be complex because it is both a fund contributor and a fund receiver. Though the debate has a lot to do with the allocation of limited financial resources, it is quite usual to find among southern European and French farmers the view that the CAP is a reflection of the EU backbone. This means that any move towards renationalising farm policies is seen as a "betrayal" of the ideals which inspired the EU.

The leeway for the EU to reach a domestic consensus to undertake further steps towards agricultural trade liberalisation will be further reduced after Enlargement as support payments become a property right for millions of farmers in the new member states. However, as farmer influence in Europe becomes eroded over the next few decades with the decline in the number of farmers, public choice theory would predict that the CAP will tend to move to a more market-oriented approach.

This was reflected by the Council deal on the EU budget reached in Brussels in December 2005. Income support expenditure will respect the spending plan reached in October 2002, before the EU Enlargement, thus preserving direct payments corresponding to those agreed with the CAP reform. However, an overall budget review by 2008-2009 was agreed; it will include examination of the Common Agricultural Policy and the British rebate. Rural development remains the main loser in budget cuts. However, the share of the "natural resource" axis in the EU budget (containing the CAP expenditure) will decrease from 47% in 2006 to 40% in 2013. At their discretion, Member States may transfer additional sums from within this ceiling to rural development programmes up to a maximum of 20% of the amounts that accrue to them from market-related expenditure and direct payments. Sums transferred to support rural development measures pursuant to such arrangements will not be subject to the national co-financing rules. Thus, a modulation scheme has been foreseen, which gives EU member states the chance to approve fundamental shifts from income support to rural development.

#### ***1.4.3 - Will the WTO involve constraints for the CAP?***

Future changes in the CAP will be determined by international trade negotiations. However, with the agreed Framework, it is unlikely that a reform of the WTO AoA will involve major needs for CAP reform. Changes will come about in the future through internal pressures, such as Enlargement (see CIHEAM, 2004) and the political debates in the Council on the future budget. The CAP will also be pressed by the Dispute Settlement Body's rulings, as has happened with the banana and sugar cases (see below). Trade disputes constitute an influence which is related to the interpretation of international law and will probably frame the CAP in the years that lie ahead. However, the July Framework, per se, does not appear to be a source of major constraints for the future CAP.

The fact that a new agreement will not involve constraints for the CAP is, to a large extent, the result of the reforms undertaken in recent years:



- The “*Everything But Arms*” initiative, which will provide least developed countries with full access to EU markets.
- The extension of preferential arrangements, which affect 64% of the EU’s total agricultural imports.
- The fact that the EU is the largest agro-food importer in the world, with imports amounting to €69.8 billion compared to the US, with €61.6 billion.
- Price reform after the completion of Agenda 2000 and the MTR will facilitate substantial reductions in export subsidies. The question is whether CAP reforms and the schedule for eliminating export subsidies by a “credible date” are consistent. The Hong-Kong Ministerial draft seems quite comfortable for the EU. Agreement has been reached on parallel elimination of all forms of export subsidies and disciplines on all export measures with equivalent effect, to be completed by the end of 2013.
- The MTR allows for a considerable reduction of the AMS and the OTDS. Even in the conservative hypothesis of partial decoupling (see Velazquez, 2004), both bound AMS and OTDS can be reduced by over 60%. And the Blue Box will actually be below the binding level of 5% of the value of EU agricultural production. As the European Union adds more member countries, without increasing its Blue Box spending, the percentage of spending compared to the overall value of production will naturally decline.

Using market price projections developed by the US Department of Agriculture, Brink (2005) concludes that the European Union and the United States could absorb 72% and 61% cuts respectively in their total AMS commitment without a significant change in policy. Brink’s projections take into account the changes in the EU agricultural programmes under the MTR, in particular the shift from Blue Box to Green Box payments, and the continuation of the current US Farm Act beyond 2007 (with the inclusion of CCPs in the Blue Box). These results support the conclusion that very large reduction percentages in the total AMS and OTDS would be required in order to generate the need for significant changes in support policies in these countries.

### **1.5 – Looking ahead: the future of the multilateral trading system**

Just before the present document went to press, a number of proposals, meetings and events were taking place in the Doha Round negotiations. While many of them could be highlighted, it might be of interest to elaborate on the US proposal on agriculture and the subsequent EU proposal.

In October 2005, the US launched an ambitious plan to unlock the negotiations on the modalities for the new AoA. In fact, until that time progress in multilateral trade negotiations seemed to be blocked by the rigid stances of the main trading

partners in the agricultural chapter. However, the US made a proposal on the three main pillars with a view to redefining the Farm Bill for 2007. In summary, the US proposal was as follows:

- With regard to export competition, complete elimination of export subsidies by 2010, in line with the G-20 proposal.
- With regard to domestic support, the US would reduce its total OTDS by 53%. Within this category of measures, it proposed that its total AMS would be reduced by 60 percentage points, whereas the *de minimis* support and the Blue Box could each amount to 2.5% of the value of agricultural production. Similarly, other countries such as the EU and Japan should also make a substantial reduction effort in proportion to their higher levels of distorting support. The US proposal advocated an 83% reduction in the AMS of both Japan and the EU, while in the case of total OTDS the EU should reduce this support by 75% and Japan by 53%.
- With regard to market access, the maximum tariff level after reductions would be 75%, with a reduction rate of between 55 and 90 percentage points, depending on the initial tariff. In addition to the cap level and the reduction rates, a maximum of 1% of tariff lines would be permitted as sensitive products.
- The Special and Differential Treatment will be ensured through slightly smaller cuts and longer phase-in periods for the market access measures.

Whereas the proposal seemed unacceptable to many other countries – such as the G-10 – it helped to re-launch the discussions on technical matters again. The EU thus tabled a new counterproposal in late October, which clearly showed its redlines as discussed in previous sections.

The EU proposal gave rise to lively internal debate, since it was close to exhausting the Council's mandate to the Commission – if not exceeding it, according to several member states' reactions. It consisted of the following aspects:

- In export competition, the EU also advocates the total elimination of all its agricultural export support, if other countries also discipline their export support. This would come about '*by an agreed date*'.
- With regard to domestic support, the EU would reduce its OTDS by 70%, in line with the maximum reductions that the MTR could permit according to the quantitative estimates shown above. Also, tighter discipline on Blue Box spending was proposed.
- Regarding market access, a 46% reduction of the EU average agricultural tariff, from the current 22.8% to 12.2%. Altogether, a 60 percentage point reduction in its highest tariffs and a range of tariff cuts between 35% and 60% for lower tariffs. The number of sensitive products designated by the EU would be reduced, while for all countries the maximum agricultural tariff would be 100%. The tariffs for sensitive products should also be reduced with simultaneous expansion of the TRQs for these products.

- With regard to SDT, developing countries would be granted higher tariff bands, lower tariff cuts and a tariff cap of 150%. The LDCs should not reduce their agricultural tariffs (a “round for free” approach).
- The EU also specified a number of conditions pertaining to this proposal and, with regard to agricultural products, mentioned disciplining US counter-cyclical payments, a commitment on reforming STEs and food aid concerning other developed countries. Similarly, the EU asks for the protection of Geographical Indications through an international register.

If both proposals are compared, they seem to be similar in substance except with regard to the percentage reduction values and capping of boxes and tariffs. While it could be seen as an improvement compared to the previous situation of deadlock, the expectations with regard to reaching an agreement for the December meeting in Hong Kong were disappointed by the reactions of the WTO partners regarding each one of the proposals and the declarations made by the Director-General of the WTO requiring members to “recalibrate” their expectations for the Hong Kong Ministerial Conference. He stressed the need to maintain the ambition of the Round and for Hong Kong to mark a step forward in successfully completing the talks next year.

As expected, the Hong Kong Ministerial Declaration did not contain specific numbers and formula structures for cutting subsidies and tariffs. The Hong Kong Ministerial Conference's most concrete achievement was to establish 2013 as the end-date for eliminating agricultural export subsidies, contingent “upon the completion of the modalities.” Members are expected to finalise full modalities by April, they must also submit comprehensive draft schedules of commitments based on them by 31 July 2006 (see Annex III).

There will thus be no agreement in the WTO until mid 2006. This opens the door to two outcomes in the near future: a) a “Uruguay Round-type” agreement on agriculture, less ambitious than the desirable outcome for the developing countries, or b) no agreement with an open door to regionalism.

In this context, several developments concerning trade policy reforms are likely to occur in the years that lie ahead.

First, once the “Peace Clause” (Article 13) of the AoA is exhausted, the WTO's Dispute Settlement Body (DSB) will probably have increasing influence on the policy reform process. Thus, policy reform will be affected by the DSB rulings rather than by a process of multilateral negotiations, as has been the case with the recent rulings on cotton, sugar and bananas. For example, the future of the Green Box payments is currently uncertain because of the recent WTO ruling under the Cotton Case. In that case, Brazil brought a complaint against certain aspects of the cotton policies of the United States. A key aspect of the complaint, for the purposes of the current discussion, was the panel's finding that US direct payments and the legislative and regulatory provisions which establish and maintain the direct

payments programme do not fully conform to the conditions set out in Annex 2 of the AoA (the Green Box). The panel concluded that since the payments were conditional on producers not planting certain commodities (more specifically fruits and vegetables) on the land on which payments were based, the payments cannot be considered to be totally “decoupled”. A further shift to decoupling is required. This is an important decision not only for the United States, but also for the European Union, whose single farm payment involves a similar requirement.

Second, as has already been mentioned, the multilateral trade reform is expected to be lengthy and much less ambitious than what many developing countries have been expecting. The EU and the US could finally reach a consensus on the use of the adjusted Blue Box and the Green Box payments as a way of facilitating trade reform. In this context, two features will contribute to assessing the real success or failure of the Doha Round, at least from the agricultural point of view in developing countries. The first is the extent of concessions in the market access pillar, especially for so-called sensitive products. The second is the ability of the US and the EU to accept tighter discipline on the Green Box payments, as recently proposed by the G-20 (June 2005).

## **1.6 – Concluding remarks**

Since MCs do not have a common position or interest within the WTO negotiations on agriculture, it is not easy to conclude a similar outcome for all of them if negotiations fail. In general terms, the EU can emerge better off under this new scenario, whereas developing MCs can find themselves in a weaker position.

Clearly, it can be said that the failure to achieve substantial progress in multilateral trade negotiations is connected with the pace of bilateral liberalisation. North-South and South-South regional liberalisation processes are being enhanced as alternative strategies for trade reform. The Moroccan-US bilateral agreement can be placed in this framework. Trade liberalisation will probably be the result of open regionalism rather than of multilateral liberalisation. A problem of this approach is the “hub and spokes” relationship between big trading powers and small developing economies. One outcome is the increased dependency of many developing areas on the market opportunities granted by the big trading powers in exchange for comprehensive trade liberalisation in the poorer economies. Another immediate result is the inconsistency of tariff elimination in developing countries with the incomplete phasing-out of domestic subsidies in developed economies. When negotiations are bilateral, the big trading powers tend to condition subsidy removal on the WTO negotiations. When this removal does not take place, as is in fact happening, the playing field of the North-South free trade areas is far from balanced.

The collapse of the multilateral system could bring failure to build a common approach for the role of agriculture in development that is shared by the various countries. All rural areas in the world have the right to rural development policies and there is no reason why agricultural policies in one part of the world should mean welfare reduction in other parts. While regional integration, expressed in the Mediterranean area by the Barcelona Process, can play a role in narrowing positions between the two shores of the Mediterranean, the WTO negotiations appear to be the last chance for many countries in the world for achieving fairer rules for agricultural trade.

Institutions such as the CIHEAM are also making a contribution to considering rural development as a “global public good” by devising institutional mechanisms that supply solutions by different countries in the Mediterranean, irrespective of their stage of development. The economic development of “poorer” countries should thus be accorded at least the same weight as the Northern rural areas.

A practical way to approach this common role for agriculture in development is to find a common view for the non-distorting or Green Box payments. Northern and Southern MCs should be able together to provide clear guidelines for other WTO members for this type of agricultural support, guidelines that allow the EU to keep non-trade products of agriculture at the desired level, and, simultaneously, Southern MCs could provide their farmers with the required support to improve their quality of life and to restructure their farms and could meet the other needs of their agricultural populations. It is to be hoped that CIHEAM high-level meetings can help to design this new Green Box best suited to all countries’ needs.

## Appendices

### **Annex I - List of members of several groups in Doha Development Round negotiations - MCs in bold letters -**

**Cairns Group:** Argentina, Australia, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Guatemala, Indonesia, Malaysia, New Zealand, Paraguay, Philippines, South Africa, Thailand, Uruguay

**G-10:** Bulgaria, Iceland, **Israel**, Japan, Republic of Korea, Liechtenstein, Mauritius, Norway, Switzerland, Chinese Taipei

**G-20:** Argentina, Bolivia, Brazil, Chile, China, Cuba, **Egypt**, India, Indonesia, Mexico, Nigeria, Pakistan, Paraguay, Philippines, South Africa, Tanzania, Venezuela, Zimbabwe. (Countries participating in the 11–12 December 2003 G-20 Ministerial Meeting)

**G-33** (understood to comprise 42 countries): Antigua and Barbuda, Barbados, Belize, Benin, Botswana, China, Congo, Côte d'Ivoire, Cuba, Dominican Republic, Grenada, Guyana, Haiti, Honduras, India, Indonesia, Jamaica, Kenya, Korea, Mauritius, Madagascar, Mongolia, Mozambique, Nicaragua, Nigeria, Pakistan, Panama, Peru, Philippines, Senegal, St Kitts and Nevis, St Lucia, St Vincent & the Grenadines, Sri Lanka, Suriname, Tanzania, Trinidad and Tobago, **Turkey**, Uganda, Venezuela, Zambia, Zimbabwe

**African Union/Group, ACP, least-developed countries** (also known as “**G-90**”, but with 64 WTO members): Angola, Antigua and Barbuda, Bangladesh, Barbados, Belize, Benin, Botswana, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Congo, Côte d'Ivoire, Cuba, Democratic Republic of the Congo, Djibouti, Dominica, Dominican Republic, **Egypt**, Fiji, Gabon, The Gambia, Ghana, Grenada, Guinea (Conakry), Guinea Bissau, Guyana, Haiti, Jamaica, Kenya, Lesotho, Madagascar, Malawi, Maldives, Mali, Mauritania, Mauritius, **Morocco**, Mozambique, Myanmar, Namibia, Nepal, Niger, Nigeria, Papua New Guinea, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent & the Grenadines, Senegal, Sierra Leone, Solomon Islands, South Africa, Suriname, Swaziland, Tanzania, Togo, Trinidad and Tobago, Tunisia, Uganda, Zambia, Zimbabwe

Source: WTO, 2004.

## Annex II - Proposals in which MCs have taken part

### Phase 1 (23–24 March 2000 to 26–27 March 2001)

Proposals received		Mediterranean country involved in the proposal
G/AG/NG/W/17	EU: <b>The Blue Box and Other Support Measures to Agriculture</b> – 28 June 2000	EU Members
G/AG/NG/W/18	EU: <b>Food Quality: Improvement of Market Access Opportunities</b> – 28 June 2000	
G/AG/NG/W/19	EU: <b>Animal Welfare and Trade in Agriculture</b> – 28 June 2000	
G/AG/NG/W/34	EU: <b>Export Competition</b> – 18 September 2000	
G/AG/NG/W/56	<b>Domestic Support – Additional Flexibility for Transition Economies</b> – 14 November 2000	Albania
G/AG/NG/W/57	<b>Market Access</b> – 14 November 2000	Slovenia, Croatia
G/AG/NG/W/90	EU: <b>Comprehensive negotiating proposal</b> – 14 December 2000	
G/AG/NG/W/105	Morocco: <b>Negotiating proposal</b> – 5 February 2001	Morocco
G/AG/NG/W/106	Turkey: <b>Negotiating proposal</b> – 5 February 2001	Turkey
G/AG/NG/W/107 + rev.1	Egypt: <b>Comprehensive proposal</b> – 6 February 2001, revised 21 March 2001	Egypt
G/AG/NG/W/140	Jordan: <b>Negotiating proposal</b> – 22 March 2001	Jordan
G/AG/NG/W/142	African Group: <b>Joint negotiating proposal</b> – 23 March 2001	Egypt, Morocco, Tunisia

### Technical submissions

G/AG/NG/W/36 and G/AG/NG/W/36/Rev.1	<b>Submission on Non-Trade Concerns</b> – 22 September 2000; <b>Revision</b> – 9 November 2000	EU, Israel, Cyprus, Malta
G/AG/NG/W/141	Croatia: <b>Submission</b> – 23 March 2001	Croatia

### Phase 2

Most of these are proposals or elaborations of Phase 1 proposals. A few are questions on others' proposals. Most are off-the-record "non-papers".

- **EU:** Tariff rate quotas administration
- **EU:** Amber Box
- **Israel:** Export subsidies
- **EU:** Export credits
- **EU:** Food safety
- **Cyprus:** Rural development

**Annex II (contd.)**

- **EU:** Geographical indications
- **Cyprus:** Green Box
- **EU:** Green Box
- **African Group:** Trade preferences
- **EU:** Tariff preferences for developing countries
- **7 developing countries (Cuba, Egypt, Grenada, Mauritius, Nigeria, Sri Lanka and Uganda):** Food aid
- **EU:** Food aid
- **EU:** Consumer information and labelling
- **African Group:** Proposal on trade in agricultural commodities and the concerns of single commodity exporters (SCEs)
- **African Group, Cuba, Dominican Republic, El Salvador, Honduras, Kenya, Pakistan, and Sri Lanka:** Special and differential provisions

**Technical submissions received during Phase 2**

G/AG/NG/W/187

**Aspects of non-trade concerns in (post) transition economies**  
(10 countries, including Croatia)— 5 December 2001**The Cancún 'framework' proposals**

Before Cancún:

- **US-EU:** JOB(03)/157 (restricted), 13 August 2003
- **G-20 (Argentina, Bolivia, Brazil, Chile, China, Colombia, Costa Rica, Cuba, Ecuador, Egypt, El Salvador, Guatemala, India, Mexico, Nigeria, Pakistan, Paraguay, Peru, Philippines, South Africa, Thailand, Venezuela):** JOB(03)/162 (restricted), 20 August 2003; re-circulated as WT/MIN(03)/W6 including Add.1 and Add.2, 30 September 2003

During Cancún, the following members proposed amendments to the framework in the Pérez del Castillo draft:

- **Israel:** WT/MIN(03)/W/16, 12 September 2003
- **African Union, ACP, least developed countries:** WT/MIN(03)/W/17, 12 September 2003

Source: WTO, 2004.



### **Annex III – Hong-Kong Ministerial Declaration (section on Agricultural Negotiations)**

4. We reaffirm our commitment to the mandate on agriculture as set out in paragraph 13 of the Doha Ministerial Declaration and to the Framework adopted by the General Council on 1 August 2004. We take note of the report by the Chairman of the Special Session on his own responsibility (TN/AG/21, contained in Annex A). We welcome the progress made by the Special Session of the Committee on Agriculture since 2004 and recorded therein.

5. On domestic support, there will be three bands for reductions in Final Bound Total AMS and in the overall cut in trade-distorting domestic support, with higher linear cuts in higher bands. In both cases, the Member with the highest level of permitted support will be in the top band, the two Members with the second and third highest levels of support will be in the middle band and all other Members, including all developing country Members, will be in the bottom band. In addition, developed country Members in the lower bands with high relative levels of Final Bound Total AMS will make an additional effort in AMS reduction. We also note that there has been some convergence concerning the reductions in Final Bound Total AMS, the overall cut in trade-distorting domestic support and in both product-specific and non product-specific *de minimis* limits. Disciplines will be developed to achieve effective cuts in trade-distorting domestic support consistent with the Framework. The overall reduction in trade-distorting domestic support will still need to be made even if the sum of the reductions in Final Bound Total AMS, *de minimis* and Blue Box payments would otherwise be less than that overall reduction. Developing country Members with no AMS commitments will be exempt from reductions in *de minimis* and the overall cut in trade-distorting domestic support. Green Box criteria will be reviewed in line with paragraph 16 of the Framework, *inter alia*, to ensure that programmes of developing country Members that cause no more than minimal trade-distortion are effectively covered.

6. We agree to ensure the parallel elimination of all forms of export subsidies and disciplines on all export measures with equivalent effect to be completed by the end of 2013. This will be achieved in a progressive and parallel manner, to be specified in the modalities, so that a substantial part is realized by the end of the first half of the implementation period. We note emerging convergence on some elements of disciplines with respect to export credits, export credit guarantees or insurance programmes with repayment periods of 180 days and below. We agree that such programmes should be self-financing, reflecting market consistency, and that the period should be of a sufficiently short duration so as not to effectively circumvent real commercially-oriented discipline. As a means of ensuring that trade-distorting practices of STEs are eliminated, disciplines relating to exporting STEs will extend to the future use of monopoly powers so that such powers cannot be exercised in any way that would circumvent the direct disciplines on STEs on export subsidies, government financing and the underwriting of losses. On food

aid, we reconfirm our commitment to maintain an adequate level and to take into account the interests of food aid recipient countries. To this end, a "safe box" for bona fide food aid will be provided to ensure that there is no unintended impediment to dealing with emergency situations. Beyond that, we will ensure elimination of commercial displacement. To this end, we will agree effective disciplines on in-kind food aid, monetization and re-exports so that there can be no loop-hole for continuing export subsidization. The disciplines on export credits, export credit guarantees or insurance programmes, exporting state trading enterprises and food aid will be completed by 30 April 2006 as part of the modalities, including appropriate provision in favour of least-developed and net food-importing developing countries as provided for in paragraph 4 of the Marrakesh Decision. The date above for the elimination of all forms of export subsidies, together with the agreed progressivity and parallelism, will be confirmed only upon the completion of the modalities. Developing country Members will continue to benefit from the provisions of Article 9.4 of the Agreement on Agriculture for five years after the end-date for elimination of all forms of export subsidies.

7. On market access, we note the progress made on *ad valorem* equivalents. We adopt four bands for structuring tariff cuts, recognizing that we need now to agree on the relevant thresholds – including those applicable for developing country Members. We recognize the need to agree on treatment of sensitive products, taking into account all the elements involved. We also note that there have been some recent movements on the designation and treatment of Special Products and elements of the Special Safeguard Mechanism. Developing country Members will have the flexibility to self-designate an appropriate number of tariff lines as Special Products guided by indicators based on the criteria of food security, livelihood security and rural development. Developing country Members will also have the right to have recourse to a Special Safeguard Mechanism based on import quantity and price triggers, with precise arrangements to be further defined. Special Products and the Special Safeguard Mechanism shall be an integral part of the modalities and the outcome of negotiations in agriculture.

8. On other elements of special and differential treatment, we note in particular the consensus that exists in the Framework on several issues in all three pillars of domestic support, export competition and market access and that some progress has been made on other special and differential treatment issues.

9. We reaffirm that nothing we have agreed here compromises the agreement already reflected in the Framework on other issues including tropical products and products of particular importance to the diversification of production from the growing of illicit narcotic crops, long-standing preferences and preference erosion.

10. However, we recognize that much remains to be done in order to establish modalities and to conclude the negotiations. Therefore, we agree to intensify work on all outstanding issues to fulfil the Doha objectives, in particular, we are resolved

to establish modalities no later than 30 April 2006 and to submit comprehensive draft Schedules based on these modalities no later than 31 July 2006.

## **PART II**

# **The Mediterranean and the cereals issue. Geostrategy, trade, outlook**

Mahmoud ALLAYA, CIHEAM-IAM Montpellier (France)  
Gabrielle RUCHETON, CIHEAM-IAM Montpellier (France)  
Akka AIT EL MEKKI, ENA Meknes (Morocco)  
Foued CHEHAT, INA Algiers (Algeria)  
Alicia LANGREO, General Director of Sabora Studies Company (Spain)  
Isabel BENITO, Director of Sabora Studies Company (Spain)  
Erol CAKMAK, Middle East Technical University of Ankara (Turkey)  
H. OZAN ERUYGUR, Middle East Technical University of Ankara (Turkey)

## ***2 Cereal supplies in the Mediterranean countries: situations and outlook***

Cereals constitute the basic diet in most Mediterranean countries. Direct human consumption currently amounts to approximately 250 kg per capita per annum in countries where consumption is high and incomes are low, since cereals constitute the least expensive calories in the diet; in high-income countries cereals are replaced by other products such as fruit and vegetables, meat, etc., which are generally more expensive; per capita cereals consumption is thus lower: 120 kg to 150 kg per capita per annum. Cereals contribute 35% to 50% of calorie intake in Mediterranean diets. These general figures for the Mediterranean region as a whole differ from one country to another depending on cultural and dietary tradition, living environment, lifestyle, etc.

As regards supply, cereals constitute the main agricultural commodities throughout the Mediterranean accounting for over 50% of total acreage. Acreage under cereals in the region is decreasing slightly with the exception of several countries in the South. In the period from 1996 to 2000, the largest areas under cereals were recorded in Turkey (14 million ha), France (9 million ha), Spain 6.7 million ha) and Morocco (5 million ha).

Wheat, maize and barley are the main cereals grown in the Mediterranean region. France is the leading producer in the region in the case of all three of these commodities, producing 69.6 million tonnes (MT) of cereals in 2004, followed by Turkey (34 MT), Spain (24.6 MT), Italy (22.4 MT) and Egypt (20 MT).

Cereal growing is an important component of both the agricultural and the food economies of Mediterranean countries. In the northern countries, output is steadily increasing as the result of yield improvement achieved through advancement in genetics and the enhancement of technologies and production inputs in favourable climatic conditions; some progress is also observed in production in the southern countries, but production methods are still inefficient and, in particular, yields are still low.

As regards supplies, the Mediterranean region is a net cereals importer, absorbing 27% of world cereal imports for only 8.4% of the world population. Over the last 20 years, the Mediterranean region has accounted for a growing share of the world market (27% of world imports in the 1996-2000 period compared to 22% in 1981-1985). The situation is similar in the export field but with a slightly lower share (13% of world exports in the 1981-1985 period and 15% in 1996-2000). The Mediterranean's net deficit is growing, amounting to approximately 30 million tonnes of cereals (compared to 22 million tonnes in the period from 1981 to 1985). It should be noted, however, that within the region France is the only net cereals exporter, the other countries registering a deficit varying in volume; the biggest

importers in the 1996-2000 period were Egypt (9.2 MT), Italy (8.3 MT), Spain (6.5 MT), Saudi Arabia (6.5 MT), Algeria (5.8 MT) and Turkey (3.1 MT).

This introductory presentation will be confined to a brief analysis of recent developments and the outlook with regard to the consumption and production in Mediterranean countries and their international trade; it will then be followed by case studies on four countries: Spain, Turkey, Morocco and Algeria.

## **2.1 - Cereals consumption and demand**

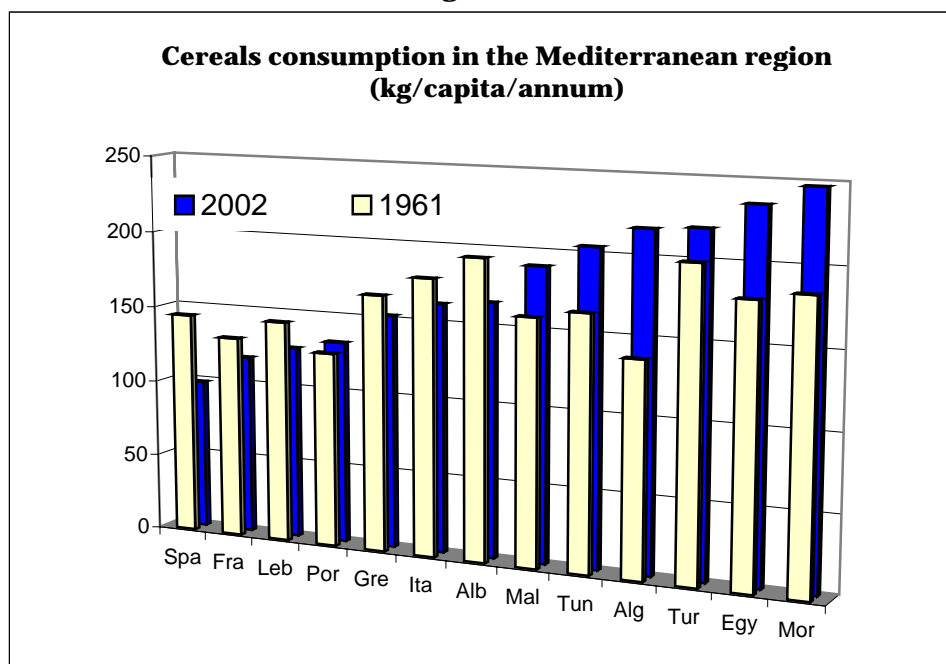
Cereals consumption depends on consumer behaviour, which is often to be explained by factors concerning living standards and lifestyle.

The cereal needs of medium-income consumers are generally covered, cereals being considered table consumer goods characterised by low consumption elasticity compared to income, which means that cereals consumption only increases slightly when incomes rise.

The situation is different in the case of low-income consumers, since their cereal needs are still far from being met. Cereals consumption elasticity compared to income can be fairly high, resulting in an appreciable increase in the consumption of cereals when incomes rise.

The case of high-income consumers is different again. High incomes allow consumers to diversify their choices and this results in negative elasticity, which is reflected in a drop in cereal consumption following a rise in income, since cereals are replaced by other foodstuffs which consumers prefer.

**Figure 2.1**

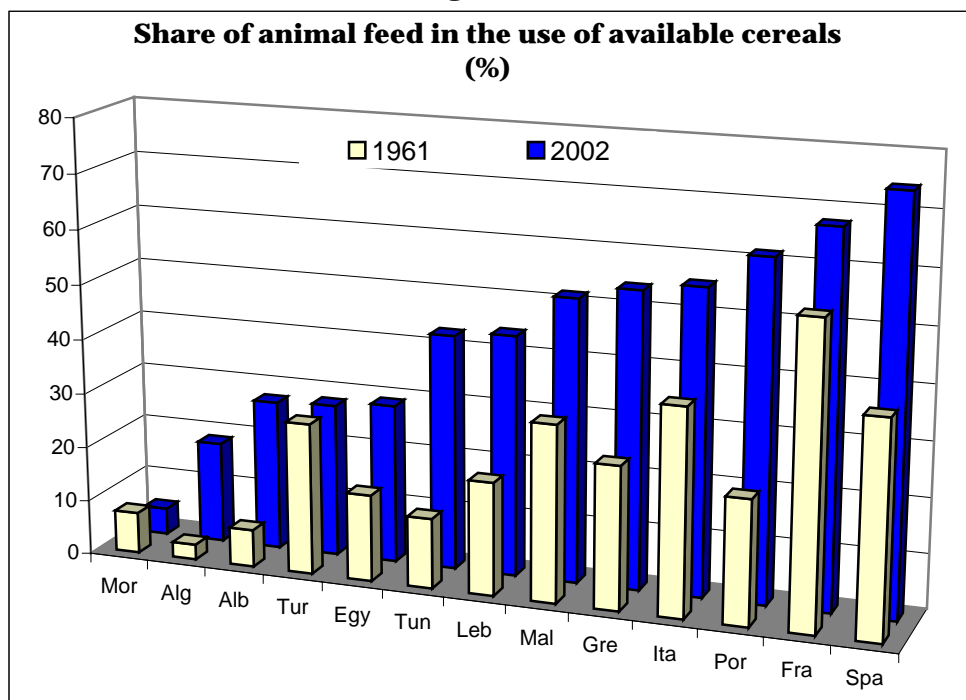


It is observed that cereal consumption levels differ rather widely from one Mediterranean country to another. The countries can be divided into three groups: in the first group (Morocco, Algeria, Tunisia, Egypt, Turkey), average annual per capita consumption is between 200 kg and 250 kg; in the second group (Greece, Portugal, Italy, Albania, Malta), consumption is between 130 kg and 160 kg; and in the third group (Spain and France), consumption is close to or below 100 kg. The evolution of cereals consumption over the last 40 years confirms on the whole the consumption elasticities compared to income presented above: per capita consumption has been dropping in high-income countries (Spain, Italy, France, Greece), whereas it has been rising in low-income countries (Egypt, Morocco, Algeria, Tunisia, Turkey). This general trend must be qualified according to country and population group, account being taken of traditions and cultural habits. In Italy, for example, cereals consumption is higher compared to consumption in France or Spain; and in France there has been a slight increase in cereals consumption over the past decade after a long downward trend, a factor to be explained by an evolution in consumption patterns towards a certain return to tradition, particularly with regard to the consumption of bread.

And there is a further differentiation that must be underlined with regard to cereals consumption: the use of cereals in animal feed. For the animal husbandry systems established in several countries include a large proportion of cereals in that feed. In

some countries – Malta, Greece, Italy, Portugal, France and Spain – the proportion of cereals used in animal feed is over 50%. Conversely, in southern and eastern Mediterranean countries cereals are used mainly for human consumption, although the share devoted to feedingstuffs is growing rapidly in several countries such as Algeria, Egypt, Tunisia and Lebanon.

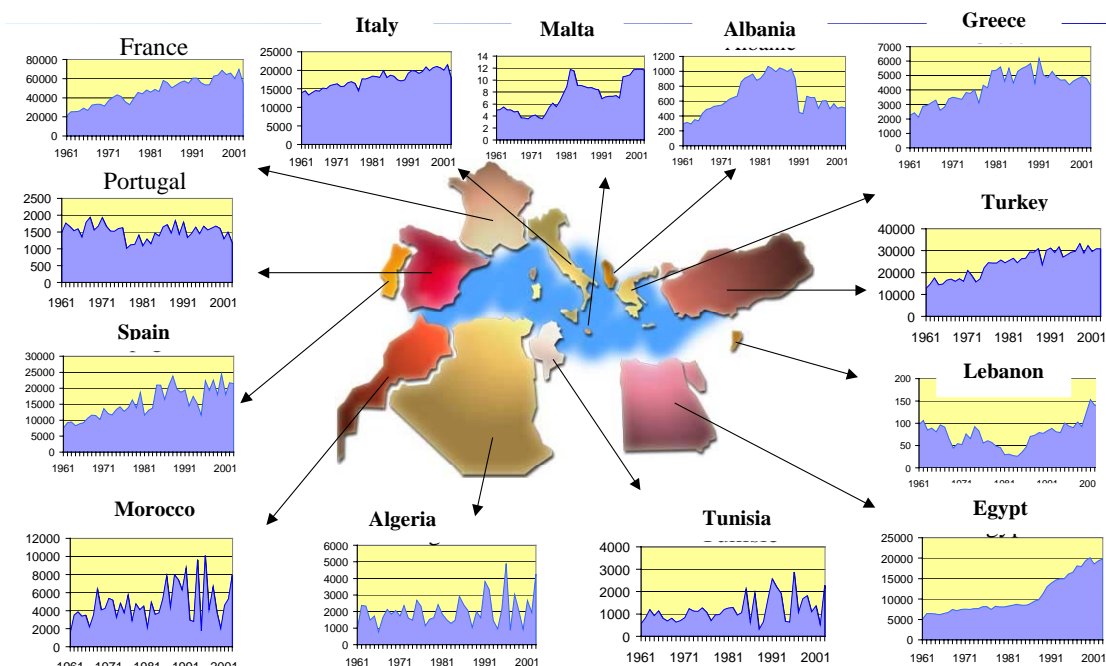
**Figure 2.2**





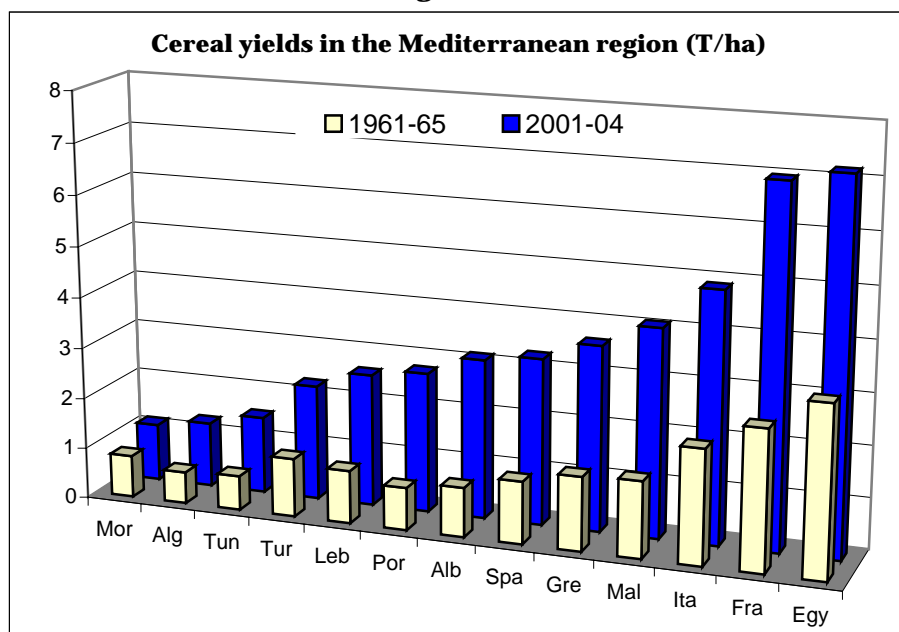
## 2.2 - Cereals production in the Mediterranean region

**Map 2.1 - Cereals production in the Mediterranean (1000T)**



Source : Mediterranean Observatory, CIHEAM. [www.ciheam.org](http://www.ciheam.org)

The Mediterranean countries produce approximately 200 million tonnes (MT) of cereals (2001-2004 average, i.e. 9% of world output), mainly in France (64 MT), Turkey (31 MT), Spain (21 MT), Italy (20.5 MT) and Egypt (19.4 MT). These five countries together account for over 75% of cereals production in the Mediterranean region. Growth in cereals production has been quite considerable over a long period (1963-2003): 1.8% to 3% per annum in several countries (Egypt [2.95%], France [2.33%], Spain [2.29%], Turkey [1.88%] and Morocco [1.86%]). It must be pointed out, however, that growth rates differ from one country to another due to climatic conditions and varying degrees of expertise in production techniques. Growth in production has been fairly regular in France, Italy, Greece, Turkey, Egypt and, to a lesser extent, Spain, but has fluctuated considerably on the other hand in Morocco, Tunisia and Algeria in connection with climate variations.

**Figure 2.3**

Growth in cereals production is to be explained mainly by improvement in yields, for acreage has generally decreased slightly in most countries, with the exception of Egypt (+0.98%), Morocco (+1%) and Turkey (+0.17%). However, yield improvement, which is the result of considerable technological advancement in genetics, crop-growing techniques and the policies pursued, varies from one country and crop to another. France registers the highest yields for wheat, for example, with 7 T/ha (a yield which has increased by 240% in 40 years), followed by Egypt (6.4 T/ha). The highest maize yields are registered in Greece (9.6 T/ha and Spain (9.5 T/ha), followed by Italy (9.1 T/ha) and France (8.4 T/ha). Yield improvement has been more marked in the case of maize than of wheat in most Mediterranean countries. Greece has multiplied its yields by 6 in 40 years and Spain by 4, whereas Italy and France have almost tripled their yields. Although yield progression has been registered in the other countries it has been less marked, a fact which is related to the more limited potential in these countries and probably less efficient management of the conditions for implementing technological advancement.

Wheat is the main cereal produced in the Mediterranean region with a total output of 103 MT. The average growth rate in output has been 1.4% per annum for the region as a whole.

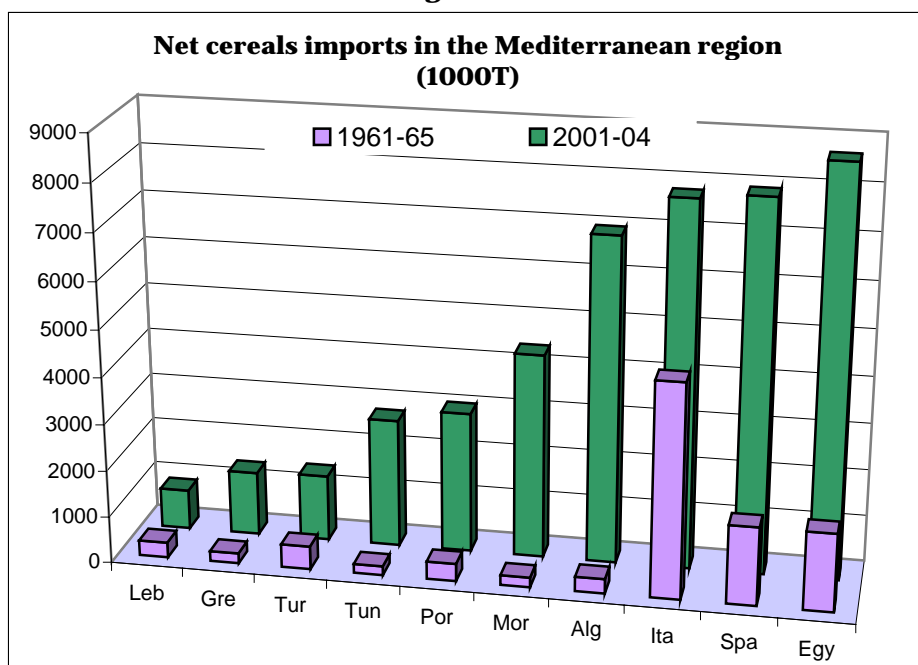
Maize is the second Mediterranean cereal; output has grown considerably (by 3% to 4% per annum) in connection with the development in animal products. Maize production currently amounts to some 47 MT (compared to 17 MT in the 1961-1965 period); it is grown mainly in France, Italy, Spain, Egypt and Greece.

Growth in barley output has been low or negative in most countries with the exception of Spain, Italy and Turkey, a total output of 35 MT currently being produced in the Mediterranean region as a whole.

### **2.3 - Trade in cereals in the Mediterranean countries**

The major trends in the Mediterranean cereals trade can only be analysed in relation to the world context, i.e. to the positions of the dominant countries and operators on the import and export markets. Taken as a whole, the Mediterranean countries' foreign trade in agricultural commodities and foodstuffs shows a considerable deficit; the import-export ratio of the region is 82%; in terms of the average for 2001-2003, France, Spain and Turkey were the only countries showing a surplus, the others often registering an import-export ratio of less than 50%.

**Figure 2.4**



The Mediterranean countries, with the exception of France, have thus been net cereal importers for many years; growth in output has been unable to cover the growth in demand in most countries, which have thus been resorting more and more to imports. The overall deficit of the Mediterranean region amounts to approximately 30 MT (22 MT in the 1981-1985 period). The biggest importers in 2001-2004 were Spain (9.8 MT), Italy (9.4 MT), Egypt (9.3 MT), Algeria (6.9 MT) and Morocco (4.5 MT); of these main importers only Italy showed a steady flow of, or slight growth in, imports, whereas the imports of the other countries grew considerably (by 5% to 7% per year).

Wheat accounts for the largest volume of cereal imports in Italy (75%), Algeria (75%) and Morocco (71%). However, the growth in maize imports has been accelerating since the 1980s in connection with the development of animal husbandry, particularly in Spain, Greece, Turkey and Egypt.

Although the significance of trade in agricultural commodities and foodstuffs compared to trade in all commodities is tending to decrease in all countries in connection with industrial development and the rise in oil prices, the volume of agro-food imports is still considerable in several countries such as Algeria (23%), Egypt (21%) and Morocco (14%). Cereal imports still account for a large share of agricultural imports: 40% in Tunisia, Egypt and Morocco, and 38% in Algeria.

The European Union and the United States are the main cereals suppliers of Mediterranean countries. These two suppliers exported "cereals and edible grain preparations" amounting to a value of \$7 billion to Mediterranean countries on average over the period from 2000 to 2003, accounting for 23% of their cereal exports to the world market. The European Union is by far the leading cereals supplier on most Mediterranean markets, although the United States is in the lead on the Egyptian and Turkish markets.

The phenomenon of massive cereals imports by low-income countries raises the crucial question of how to achieve greater food security. For a country which cannot achieve self-sufficiency is obviously obliged to import, and this requires purchasing power. Failure to increase agricultural production or lack of funding for food imports is liable to result in serious problems for the countries concerned but also for Europe and the other partners. If these countries are to take up the challenge it is absolutely imperative that appropriate national policies be implemented but also that efforts be made to seek international and Euro-Mediterranean cooperation with a view to improving cereals supplies in low-income countries with high deficits.

**Table 2.1 - Exports of cereals and edible grain preparations  
(in \$ million) 2000-2003 average**

<b>Origin Destination</b>	<b>EU</b>	<b>US</b>	<b>Australia</b>	<b>Canada</b>	<b>Total</b>
<b>World</b>	<b>19 237.4</b>	<b>11 596.5</b>	<b>1 116.7</b>	<b>3 973.5</b>	<b>35 924.2</b>
<b>Greece</b>	277.1	5.8	0.0	20.4	303.2
<b>Tunisia</b>	108.2	56.2	0.0	38.6	203.0
<b>Turkey</b>	64.3	108.0	10.2	6.7	189.2
<b>Portugal</b>	514.0	10.7	0.3	1.5	526.4
<b>France</b>	1 658.9	35.9	0.4	3.1	1 698.2
<b>Morocco</b>	227.8	77.9	0.0	103.0	408.7
<b>Algeria</b>	337.4	161.6	0.0	179.1	678.1
<b>Egypt</b>	137.6	762.7	1.6	15.0	917.0
<b>Spain</b>	1 108.0	67.7	0.2	33.7	1 209.6
<b>Italy</b>	1 274.2	137.1	1.1	92.0	1 504.4
<b>Total</b>	<b>5 707.4</b>	<b>1 423.5</b>	<b>11.4</b>	<b>494.1</b>	<b>7 636.5</b>

Source: our calculations based on OECD data.

## **2.4 - Outlook**

The cereal prospects of Mediterranean countries depend on many factors which condition the evolution of supply and demand in each of the countries in the region. On the demand side, the main factors are related to population development, urbanisation and growth in incomes. On the supply side, the essential determinants are the integration of technological progress and the dissemination of that progress – factors which would lead to growth in yields. Depending on the degree of their impact, the policies that are implemented to regulate supply and demand will help to improve market equilibrium.

To conclude this brief general presentation we shall endeavour to outline the scenarios of the development of supply and demand in each individual country on the basis of the predominant trends observed in the past few decades with a view to estimating potential cereals deficits or surpluses. These estimates will give an initial rough idea, which will then have to be elaborated on through more specific analyses per cereal product and per country according to the information available and the hypotheses of future developments regarding population trends, urbanisation, growth in incomes, the evolution of consumption patterns, non-food use of cereals and supply trends per product.

A table is set out below summarising the prospects regarding cereals supply and demand by 2015; it has been drawn up on the basis of projections of trends for each country:

- Population trends: United Nations projections (source: World Population Prospects, United Nations 2002).
- Production: projections established on the basis of trends between 1961 and 2004.
- Human consumption: projection of the trends observed between 1992 and 2002.
- Animal consumption: projection of the trends observed between 1992 and 2002.
- Other uses of cereals (seeds, losses, non-food uses, etc.): estimation based on the developments observed between 1992 and 2002.
- Total cereals demand has been calculated by adding together human and animal consumption and other uses.
- The deficit or surplus is obtained by the difference between production and total demand in each country.

Deficits would tend to increase in most countries in the region with the exception of Italy and Turkey, despite growth in production; these deficits are often generated by a sharp increase in cereals demand for animal feed. It is thus calculated that by 2015 animal feed would account for over 50% of cereals demand in Spain, Portugal, France, Italy, Greece and Malta and would account for between 30% and 50% in Turkey, Tunisia, Egypt, Lebanon and Albania. Cereals demand for human consumption would remain predominant in Morocco (84%), Algeria (71%) and Egypt (53%).

**Table 2.2 - Prospects regarding cereals supply and demand in the Mediterranean region by 2015**

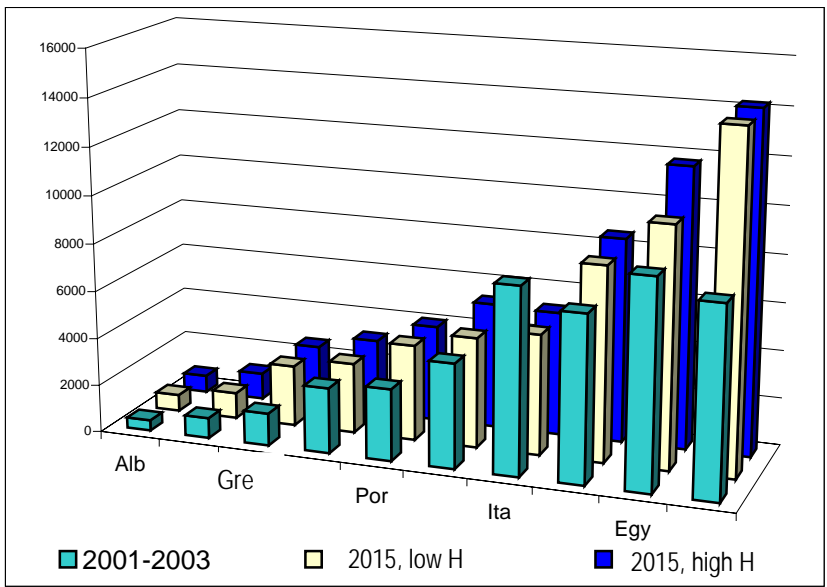
	Population		Per capita cereals consumption	Human cereals consumption per country		Animal cereals consumption per country	Total cereals demand per country	
	in thousands		kg/caput/annum	1000 T		1000 T	1000 T	
Hypothesis <sup>(1)</sup>	B	H	2015	B	H	2015	B	H
<b>Albania</b>	3 291	3 543	108	356	383	382	1 015	1 042
<b>Algeria</b>	36 467	39 817	223	7 669	8 069	2 013	10 845	11 245
<b>Egypt</b>	86 200	93 693	226	19 479	21 172	13 486	36 591	38 284
<b>Spain</b>	40 329	41 994	94	3 810	3 968	32 666	40 133	40 290
<b>France</b>	60 899	64 037	130	7 893	8 300	32 937	48 189	48 596
<b>Greece</b>	10 782	11 106	149	1 637	1 687	3 715	6 613	6 662
<b>Italy</b>	55 100	55 904	175	9 644	9 785	16 829	28 227	28 368
<b>Lebanon</b>	4 015	4 307	124	499	536	659	1 214	1 250
<b>Malta</b>	406	416	232	94	97	157	266	268
<b>Morocco</b>	35 016	37 903	273	9 543	10 329	400	11 335	12 122
<b>Portugal</b>	9 933	10 124	144	1 426	1 454	4 365	6 123	6 151
<b>Tunisia</b>	10 594	11 638	195	2 063	2 266	2 454	4 789	4 992
<b>Turkey</b>	78 463	85 837	198	15 540	17 000	11 405	33 771	35 232

**Table 2.2 (contd.)**

	Production	Total cereals demand per country		Cereals deficit or surplus per country		Cereals deficit or surplus per country	
		2015					2001-04
		1000 T	1000 T		1000 T		1000 T
Hypothesis <sup>(1)</sup>		B	H	B	H		
Albania	320	1 015	1 042	-695	-722	-438	
Algeria	2 700	10 845	11 245	-8 145	-8 545	-6 947	
Egypt	26 569	36 591	38 284	-10 022	-11 715	-8 668	
Spain	26 067	40 133	40 290	-14 066	-14 223	-7 894	
France	81 234	48 189	48 596	33 045	32 638	27 433	
Greece	4 064	6 613	6 662	-2 549	-2 598	-1 361	
Italy	23 178	28 227	28 368	-5 049	-5 190	-7 778	
Lebanon	132	1 214	1 250	-1 082	-1 118	-849	
Malta	316	266	268	50	47	151	
Morocco	6 715	11 335	11 989	-4 620	-5 274	-4 366	
Portugal	2 108	6 123	6 151	-4 015	-4 043	-3 008	
Tunisia	1 837	4 789	4 992	-2 952	-3 155	-2 742	
Turkey	34 735	33 771	35 232	964	-496	-1 406	

- <sup>(1)</sup> B: low hypothesis of population growth calculated by the United Nations  
H: high hypothesis of population growth calculated by the United Nations (World Population Prospects, United Nations 2002)

**Figure 2.5 - Prospects regarding the cereals deficit of Mediterranean countries by 2015 (in 1000 T)**





## Appended tables

**Table 2.3 – Human annual per capita cereals consumption**

	1961	1982	1992	2002
	kg/caput/annum			
<b>Albania</b>	195	221	197	165
<b>Algeria</b>	139	191	224	217
<b>Egypt</b>	180	220	242	235
<b>Spain</b>	145	104	100	98
<b>France</b>	132	107	105	117
<b>Greece</b>	167	158	150	152
<b>Italy</b>	180	159	155	162
<b>Lebanon</b>	145	137	133	126
<b>Malta</b>	160	148	145	190
<b>Morocco</b>	185	240	233	247
<b>Portugal</b>	127	116	126	132
<b>Tunisia</b>	165	192	219	204
<b>Turkey</b>	200	223	232	219

**Table 2.4 - Total human cereals consumption**

	1961	1982	1992	2002
	1000 T			
<b>Albania</b>	411	617	646	517
<b>Algeria</b>	1 895	3 820	5 872	6 796
<b>Egypt</b>	5 399	10 139	14 062	16 584
<b>Spain</b>	5 454	3 948	3 938	4 025
<b>France</b>	8 087	5 844	6 021	7 019
<b>Greece</b>	1 748	1 552	1 538	1 972
<b>Italy</b>	10 501	8 999	8 830	9 366
<b>Lebanon</b>	301	365	379	451
<b>Malta</b>	57	49	53	75
<b>Morocco</b>	2 855	4 895	5 951	7 438
<b>Portugal</b>	1 360	1 150	1 245	1 327
<b>Tunisia</b>	875	1 309	1 868	1 986
<b>Turkey</b>	10 619	10 802	13 903	15 404

**Table 2.5 - Total animal cereals consumption**

	1961	1982	1992	2002
	<b>1000 T</b>			
<b>Albania</b>	30	194	182	268
<b>Algeria</b>	54	959	1 250	1 754
<b>Egypt</b>	1 013	3 102	4 107	7 924
<b>Spain</b>	3 499	14 236	11 422	20 323
<b>France</b>	9 810	18 601	15 213	25 161
<b>Greece</b>	616	2 619	2 360	3 070
<b>Italy</b>	6 325	9 755	11 110	13 980
<b>Lebanon</b>	78	148	218	427
<b>Malta</b>	27	49	96	102
<b>Morocco</b>	231	679	398	444
<b>Portugal</b>	399	3 066	1 655	2 743
<b>Tunisia</b>	128	638	784	1 715
<b>Turkey</b>	4 051	7 534	6 310	8 745

**Table 2.6 - Total cereals demand**

	1961	1982	1992	2002
	<b>Total</b>			
	<b>1000 T</b>			
<b>Albania</b>	441	1 022	970	978
<b>Algeria</b>	1 949	5 356	7 858	9 493
<b>Egypt</b>	6 412	14 821	20 353	27 348
<b>Spain</b>	8 953	20 532	17 879	27 349
<b>France</b>	17 897	27 306	27 627	37 283
<b>Greece</b>	2 364	4 967	4 666	5 696
<b>Italy</b>	16 826	20 408	21 845	27 251
<b>Lebanon</b>	379	565	702	974
<b>Malta</b>	84	113	171	198
<b>Morocco</b>	3 086	6 535	7 394	9 222
<b>Portugal</b>	1 759	4 625	3 268	4 463
<b>Tunisia</b>	1 003	2 229	2 976	4 003
<b>Turkey</b>	14 670	25 338	27 615	31 324

**Table 2.7 - Cereals output in the Mediterranean region**

<b>Cereals (1000 T)</b>	<b>1961-65</b>	<b>1981-85</b>	<b>2001-04</b>	<b>Tx 63-2003 <sup>(1)</sup></b>
Malta	5.1	10.1	11.8	2.10
Lebanon	91.5	29.5	145.3	1.16
Albania	317.3	995.2	513.9	1.21
Portugal	1 609.1	1 275.0	1 326.4	-0.48
Tunisia	926.6	1 329.9	1 465.1	1.15
Algeria	1 770.9	1 805.7	3 189.8	1.48
Greece	2 521.8	5 112.3	4 649.7	1.54
Morocco	3 159.1	3 939.8	6 594.1	1.86
Egypt	6 076.2	8 495.3	19 465.3	2.95
Italy	14 046.0	18 566.4	20 503.1	0.95
Spain	8 674.7	16 097.4	21 443.9	2.29
Turkey	14 831.1	25 876.7	31 289.5	1.88
France	25 331.2	50 967.2	63 614.5	2.33
<b>Wheat (1000 T)</b>	<b>1961-65</b>	<b>1981-85</b>	<b>2001-04</b>	<b>Tx 63-2003 <sup>(1)</sup></b>
Malta	2.8	6.1	9.6	3.12
Lebanon	63.6	21.1	124.6	1.69
Portugal	550.2	388.1	256.8	-1.89
Albania	110.0	559.7	289.4	2.45
Tunisia	679.0	917.7	1 206.1	1.45
Greece	1 765.4	2 430.6	1 923.8	0.22
Algeria	1 254.0	1 069.9	2 276.5	1.50
Morocco	1 336.0	1 878.6	4 340.4	2.99
Spain	4 364.6	4 693.5	6 313.9	0.93
Egypt	1 458.8	1 927.7	6 725.5	3.89
Italy	8 857.3	9 006.8	7 070.6	-0.56
Turkey	8 584.4	17 059.2	19 626.8	2.09
France	12 494.8	27 125.2	35 148.8	2.62
<b>Maize (1000 T)</b>	<b>1961-65</b>	<b>1981-85</b>	<b>2001-04</b>	<b>Tx 63-2003 <sup>(1)</sup></b>
Algeria	4.5	2.6	1.0	-3.73
Lebanon	11.9	0.8	3.0	-3.37
Morocco	352.0	236.0	132.4	-2.41
Albania	160.8	322.5	198.9	0.53
Portugal	560.3	483.2	816.8	0.95
Greece	241.4	1 777.0	2 215.1	5.70
Turkey	950.4	1 488.0	2 525.0	2.47
Spain	1 100.6	2 446.6	4 588.0	3.63
Egypt	1 912.6	3 509.6	5 813.0	2.82
Italy	3 633.1	6 743.4	10 419.0	2.67
France	2 760.0	10 594.6	15 145.5	4.35

**Table 2.7 (contd.)**

<b>Barley (1000 T)</b>	<b>1961-65</b>	<b>1981-85</b>	<b>2001-04</b>	<b>Tx 63-2003 <sup>(1)</sup></b>
Malta	2.0	3.9	2.2	0.22
Albania	7.9	28.1	3.7	-1.87
Portugal	60.6	60.6	15.2	-3.39
Lebanon	12.5	6.4	16.3	0.66
Egypt	137.1	129.1	109.7	-0.56
Greece	248.1	725.2	238.7	-0.10
Tunisia	199.0	382.0	252.1	0.59
Algeria	475.5	657.6	853.2	1.47
Italy	276.1	1 298.4	1 130.1	3.59
Morocco	1 315.7	1 709.4	2 051.2	1.12
Turkey	3 447.2	6 145.0	8 225.0	2.20
Spain	1 958.9	7 635.4	8 465.9	3.73
France	6 593.7	10 372.3	10 404.6	1.15

<sup>(1)</sup> Average annual growth rate presumed to be constant between the 1961-1965 and 2001-2004 averages.

**Table 2.8 - Cereals imports in the Mediterranean region**

<b>Cereals (1000 T)</b>	<b>1961-65</b>	<b>1981-85</b>	<b>2001-04</b>	<b>Tx 63-2003 <sup>(1)</sup></b>
Malta	84.7	119.6	152.9	1.49
Albania	149.3	66.7	439.4	2.74
Lebanon	335.3	542.5	863.5	2.39
France	1 252.8	1 816.3	1 528.4	0.50
Greece	217.1	463.5	1 864.2	5.52
Turkey	566.1	751.3	2 658.1	3.94
Tunisia	267.6	982.4	2 907.7	6.15
Portugal	378.3	3 188.1	3 189.3	5.47
Morocco	369.2	2 332.0	4 536.6	6.47
Algeria	451.2	3 992.4	6 946.8	7.07
Egypt	2 012.9	7 926.5	9 260.6	3.89
Italy	5 126.3	6 775.5	9 467.3	1.55
Spain	1 765.5	5 646.8	9 864.3	4.40
<b>Wheat (1000 T)</b>	<b>1961-65</b>	<b>1981-85</b>	<b>2001-04</b>	<b>Tx 63-2003 <sup>(1)</sup></b>
Malta	54.8	44.6	42.8	-0.62
Albania	125.6	48.0	240.8	1.64
Lebanon	184.5	331.8	395.6	1.93
France	597.4	596.7	411.6	-0.93
Greece	21.9	91.5	1 050.0	10.16
Turkey	552.4	485.7	1 094.4	1.72
Portugal	261.9	720.9	1 531.4	4.51
Tunisia	210.2	665.1	1 551.8	5.12
Morocco	250.6	1 999.4	2 944.5	6.35
Egypt	906.8	4 225.5	4 681.6	4.19
Spain	463.3	170.5	4 690.4	5.96
Algeria	361.2	2 082.1	4 872.3	6.72
Italy	935.7	3 557.2	7 409.5	5.31

**Table 2.8 (contd.)**

<b>Maize (1000 T)</b>	<b>1961-65</b>	<b>1981-85</b>	<b>2001-04</b>	<b>Tx 63-2003 <sup>(1)</sup></b>
Albania	23.8	12.0	36.7	1.09
Malta	14.5	47.8	56.5	3.45
France	456.1	625.9	248.3	-1.51
Lebanon	27.2	134.2	311.1	6.28
Greece	112.7	324.3	500.7	3.80
Tunisia	6.4	262.6	767.0	12.70
Italy	3 352.3	1 682.8	826.5	-3.44
Morocco	2.2	158.5	1 060.1	16.68
Turkey	8.9	51.6	1 177.8	12.98
Portugal	84.8	2 173.5	1 188.2	6.82
Algeria	2.2	427.5	1 642.6	18.02
Spain	845.5	4 257.1	3 375.4	3.52
Egypt	221.4	1 519.6	4 523.5	7.83
<b>Barley (1000 T)</b>	<b>1961-65</b>	<b>1981-85</b>	<b>2001-04</b>	<b>Tx 63-2003 <sup>(1)</sup></b>
Albania	0.0	2.1	1.5	
Egypt	1.0	6.3	5.1	4.14
France	26.8	195.9	32.8	0.50
Malta	6.3	23.3	41.7	4.82
Turkey	2.2	168.5	48.4	8.04
Lebanon	55.3	20.8	79.2	0.90
Greece	38.2	37.9	256.5	4.88
Portugal	5.0	41.4	311.3	10.87
Algeria	39.5	418.2	321.0	5.38
Morocco	56.8	97.0	525.7	5.72
Tunisia	44.8	46.7	569.0	6.56
Italy	641.2	1 176.9	872.9	0.77
Spain	429.1	548.1	939.2	1.98

<sup>(1)</sup> Average annual growth rate presumed to be constant between the 1961-1965 and 2001-2004 averages.

**Table 2.9 – Net cereals imports in the Mediterranean region**

<b>Cereals (1000 T)</b>	<b>1961-65</b>	<b>1981-85</b>	<b>2001-04</b>	<b>Tx 63-2003 <sup>(1)</sup></b>
France	-4 104.2	-21 810.9	-27 433.0	4.86
Malta	84.6	119.5	151.5	1.47
Albania	149.3	59.9	438.1	2.73
Lebanon	325.4	538.1	848.8	2.43
Greece	215.5	-589.7	1 361.3	4.72
Turkey	495.5	-298.6	1 405.7	2.64
Tunisia	191.3	980.1	2 742.2	6.88
Portugal	377.4	3 185.5	3 007.6	5.33
Morocco	210.6	2 321.0	4 366.4	7.87
Algeria	310.1	3 992.4	6 946.7	8.08
Italy	4 568.4	4 389.4	7 778.4	1.34
Spain	1 678.9	4 804.5	7 894.1	3.95
Egypt	1 669.3	7 880.6	8 668.3	4.20
<b>Wheat (1000 T)</b>	<b>1961-65</b>	<b>1981-85</b>	<b>2001-04</b>	<b>Tx 63-2003 <sup>(1)</sup></b>
France	-1 871.7	-1 2842.2	-14 810.6	5.31
Malta	54.8	44.6	42.0	-0.66
Albania	125.6	48.0	240.8	1.64
Lebanon	183.7	331.8	395.6	1.94
Turkey	552.1	129.2	708.6	0.63
Greece	21.9	-406.2	713.1	9.10
Portugal	261.9	720.9	1 408.6	4.30
Tunisia	150.2	663.9	1 551.8	6.01
Morocco	231.9	1 999.4	2 938.2	6.55
Spain	460.1	-29.0	3 714.3	5.36
Egypt	906.0	4 224.0	4 680.6	4.19
Algeria	342.8	2 082.1	4 872.3	6.86
Italy	915.4	3 397.1	7 214.0	5.30
<b>Maize (1000 T)</b>	<b>1961-65</b>	<b>1981-85</b>	<b>2001-04</b>	<b>Tx 63-2003 <sup>(1)</sup></b>
France	-64.1	-3303.8	-7253.2	12.55
Albania	23.8	5.2	36.7	1.09
Malta	14.5	47.7	55.7	3.42
Lebanon	26.9	130.2	309.9	6.30
Greece	112.7	262.7	462.3	3.59
Italy	3 150.4	1 482.6	681.7	-3.75
Tunisia	6.4	262.6	700.9	12.44
Morocco	-49.5	158.5	1 060.1	
Turkey	8.9	49.6	1 168.4	12.96
Portugal	84.7	2 173.2	1 180.4	6.81
Algeria	1.5	427.5	1 642.6	19.18
Spain	845.4	4 255.1	3 243.6	3.42
Egypt	220.2	1 519.6	4 522.5	7.85

**Table 2.9 (contd.)**

<b>Barley (1000 T)</b>	<b>1961-65</b>	<b>1981-85</b>	<b>2001-04</b>	<b>Tx 63-2003 <sup>(1)</sup></b>
France	-1 734.6	-3 662.2	-4 583.9	2.46
Turkey	-31.2	-186.5	-335.0	6.11
Albania	0.0	2.1	1.5	
Egypt	-0.2	6.3	5.0	
Malta	6.3	23.3	41.7	4.82
Lebanon	47.9	20.8	79.2	1.27
Greece	38.2	28.5	244.2	4.75
Portugal	5.0	41.4	288.9	10.67
Algeria	-54.4	418.2	321.0	
Morocco	11.0	97.0	525.7	10.16
Tunisia	37.8	46.7	557.2	6.96
Spain	429.1	205.2	826.5	1.65
Italy	640.4	1 114.9	869.6	0.77

<sup>(1)</sup> Average annual growth rate presumed to be constant between the 1961-1965 and 2001-2004 averages.

### **3    *Cereals policies in Morocco***<sup>1</sup>

#### **3.1 - Introduction**

The cereals sector is one of the main sectors of agricultural production in Morocco. It plays a variety of roles with regard to the annual grain-sown areas of arable land, the formation of the Gross Agricultural Product, employment in rural areas and the utilisation of industrial processing capacities. The main cereals grown are common wheat, barley, durum wheat and maize. Sorghum and rice are also grown but are of marginal importance.

Policies connected with the cereals sector have always been integrated into policies on what are known as strategic goods, which include oils and sugar in addition to cereals. These commodities have long been subject to direct intervention by the public authorities throughout the production chains. This intervention can currently be considered to be in its final phase, continuing until the liberalisation measures that are already scheduled or are to be introduced in the context of the country's commitments to the World Trade Organisation and bilateral agreements have been fully implemented.

The purpose of the present chapter is to highlight the main policy measures currently in effect for the Moroccan cereals industry. Section 1 gives an overview of the production chain focusing mainly on production systems, imports, processing and consumption. Section 2 reviews the main instruments of cereals policy during the interventionist period followed by the period of structural adjustment programmes. Section 3 describes current price policy and the trade system and underlines the instruments concerning agricultural production and the marketing and consumption of cereals. And finally, the chapter closes with an outline of the policies which should be implemented for the cereals industry's successful transition to the new context of the Moroccan economy.

---

<sup>1</sup> Akka Aït El Mekki, ENA Meknes (Morocco), July 2005.



### **3.2 - Structural data on the cereals industry in Morocco**

Agriculture plays an important role in the Moroccan economy. Its contribution to GDP ranges between 15% and 17%, and it employs just over 30% of the working population. The sector also provides indirect support for 60% of the population and generates almost 25% of export revenue. Crop and animal husbandry account for 70% and 30% of GAP respectively. The main commodities grown are cereals on the one hand and fruit and vegetables on the other, accounting for a share of 45.5% and 47% respectively of the gross value of crops in the 2002-2003 farm year (Ministry of Agriculture, 2004). Common wheat contributes almost 47% on average of the gross value of cereals, followed by durum wheat (27%), barley (23%), maize (2%) and other cereals (1%).

#### **3.2.1 - Cereals production systems**

Cereal acreage is stagnating around 5 million ha, i.e. almost 60% of AAU. However, if one takes account of fallowing, which is connected mainly with cereals production systems, acreage can amount to 75% of AAU. Cereals are grown in the various agro-climatic zones of the country in rotation with other annual crops, the main ones being legumes, industrial crops and fodder crops. The principal cereal-growing regions are in the rain-fed plains and plateaux of Chaouia, Abda, Haouz, Tadla, Gharb and Sais, where the vast majority of farms grow cereals, irrespective of their size.

In these regions, cereals production is combined with sheep farming in particular, so that farmers can develop cereal fodder resources (barley, straw, stubble, etc.). The zones classed as favourable and intermediate zones where rainfall varies between 350 mm and 450 mm account for 38% of cereals acreage on average, common and durum wheat being the predominant crops (Table 3.1). Crop management is based on the use of inputs geared to intensification, so that these zones produce almost 60% of cereals output (1998-2003 average). The zones classed as unfavourable account for just over 40% of cereals acreage, barley being the principal crop in a more or less traditional crop-growing system characterised by minimal use of breeders' seed, fertilisers and pesticides. The output of these zones oscillates around 30% of the country's total cereals output. The remaining acreage is situated in mountainous regions and regions of the Sahara with an annual share of 10% of cereals output.

**Table 3.1 - Distribution of the acreage and output of the main cereals by agro-climatic zone (%)**

Agro-climatic zone	Acreage		Output	
	2002-2003	Average 1998-2003	2002-2003	Average 1998-2003
Favourable	30.7	31.0	39.3	41.1
Intermediate	17.0	17.1	20.2	18.0
Unfavourable South	31.5	30.6	21.4	23.1
Unfavourable East	9.8	9.5	8.8	8.4
Mountains	7.7	7.2	8.4	7.2
Sahara	3.3	3.5	1.9	2.3
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Ministry of Agriculture (2004).

Production structures are subject to climatic, technical and structural constraints, which can impede the development of farmland. Climate conditions, in particular rainfall, are the main factor in the reasoning of farmers' strategies with regard to production risks. And most producers opt to use intensification factors in view of these conditions. When there is no rainfall producers generally prefer to stop spending on pest control and fertilisation, which means in turn that the impact of drought can be aggravated, whereas cautious intervention, in particular weed control measures, can reduce the drops in yield that have been registered.

Furthermore, the diverse forms of legal status<sup>2</sup> and fragmentation problems are also constraints which do not encourage investments or efforts to improve productivity. The average area farmed, which in the case of 70% of production units does not exceed 5 ha, is not conducive to overcoming these unfavourable factors.

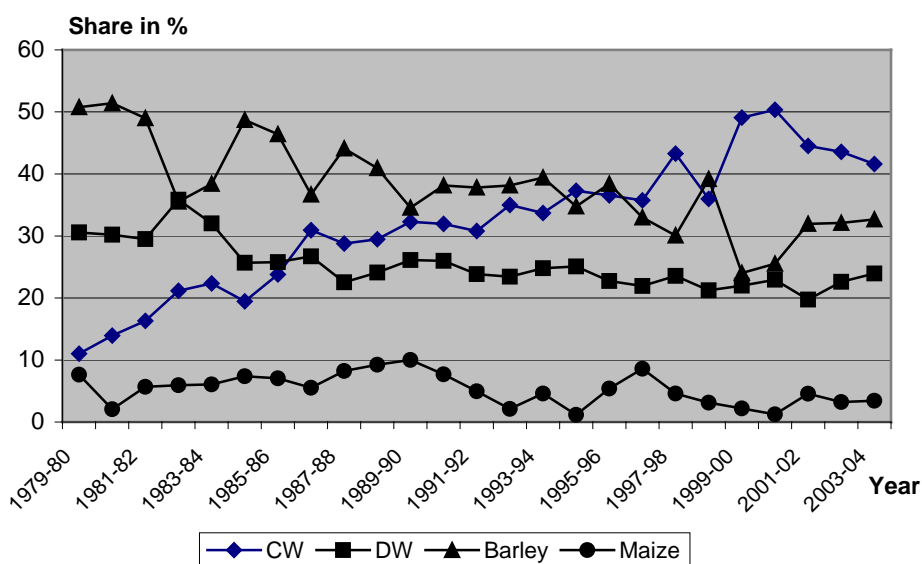
### **3.2.2 - Cereals production**

In the period from 1996 to 2004, cereal acreage amounted to almost 5.1 million ha on average. Over 43% of this acreage was under barley, followed by common wheat (35%) and durum wheat (20%), and the remainder was sown with maize, rice, sorghum etc. At the same time, cereals output amounted to just over 58 million quintals, common wheat being the predominant crop accounting for 42% of total output, barley 31%, durum wheat 22% and maize 3%. Yields vary widely from one year to the next depending on weather conditions and do not reflect the efforts made to intensify production; they have not exceeded 12 quintals/ha on average over the past five years, with 16 quintals/ha in the case of common wheat.

<sup>2</sup> These statuses include Melk property, which is privately owned, whereas collective land, Guich land, Habous land and State-owned land are subject to fairly inflexible operating rules.

Analysis of the evolution of cereals production shows that the share of barley has dropped significantly from just over 50% of cereals production in 1980 to 31% on average over the last five years (Figure 3.1). Durum wheat and maize production have also decreased, losing 7 and 4 percentage points of their share respectively. Common wheat output has grown remarkably on the other hand, from 11% to 42% of total cereals output during the period under review.

**Figure 3.1 - Evolution of the share of the major cereals in total output (1980-2004)**

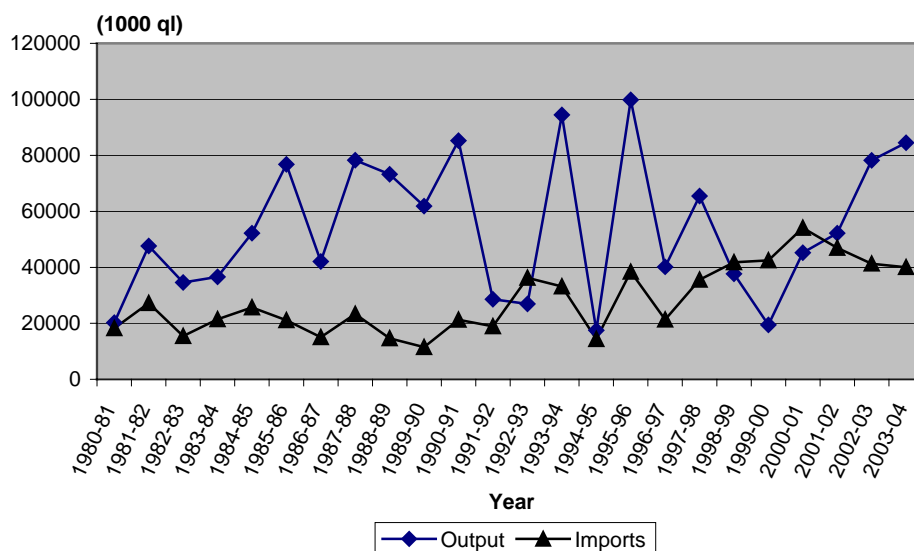


This increase in common wheat output is essentially the result of the extension of acreage stimulated by the intensification policies that have been pursued since the early 1980s. An intensification scheme was launched for this cereal, which is concentrated more in the northern part of the country, by the Ministry of Agriculture in 1985, the target being to sow 1 million ha. The scheme aims to increase common wheat output by adopting new varieties, fixing a guaranteed price for the producer and fixing marketing margins. The results were soon felt in the increase of acreage, which now amounts to almost 2 million ha. The extension of acreage under common wheat seems to be taking place essentially to the detriment of acreage under barley, which is being grown more and more in marginal zones with low agronomic potential. Despite this increase, the self-sufficiency rate is still average for common wheat due to the boom in the consumption of this commodity registered over the last two decades.

### 3.2.3 - Imports

Cereals imports develop according to the volume of national production. During the period from 1980 to 1995, the average quantities imported amounted to around 20 million quintals. As of 1996, when imports were liberalised, there was an appreciable increase in imports to begin with because the quantities harvested were below average; this was followed by a marked downward trend, and imports continued to decrease from the 2000-2001 farm year onwards (Figure 3.2). During the period from 1996 to 2004, the average quantities imported amounted to just over 40 million quintals.

**Figure 3.2 - Evolution of national cereals output and cereals imports (1980-2004)**



Analysis of the evolution of imports of the main cereals during the two periods mentioned above shows that before 1996 common wheat accounted for almost 83% of total imports, followed by maize (9.6%), barley (6.2%) and durum wheat (2.3%). After that date, despite the increase in imports the share of common wheat decreased to around 55% (Table 3.2). While this regression was registered for common wheat, the shares of barley and maize practically doubled during the 1996-2004 period. The share of durum wheat increased sixfold over the same period and currently amounts to 13% of total cereals imports. This development is certainly to be explained by the effects of the schemes for intensifying common wheat production.

**Table 3.2 - Evolution of the share of imports  
of the main cereals (%)**

<b>Commodity</b>	<b>1980-1995</b>	<b>1996-2004</b>	<b>2003-2004</b>
Common wheat	82.7	54.9	49.0
Durum wheat	2.3	12.8	16.9
Barley	6.2	12.0	3.5
Maize	9.6	20.3	30.6
<b>Total cereals</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Ministry of Agriculture (2005).

Common wheat imports come mainly from the countries of the EU (France, Germany), which have supplied just over 56% of the quantities imported over the last five years. The United States accounts for almost 21% of imports, whereas Ukraine, Russia, Canada and Argentina are the main suppliers accounting for the rest of the volumes of common wheat imported. In the case of durum wheat, Canada is Morocco's leading supplier. The share of Canadian durum wheat in the country's total imports actually amounts to almost 78% with a volume of just over 4.3 million quintals on average in the last five years. The US ranks second, supplying almost 670 000 quintals, i.e. 12% of total imports. The contribution of the countries of the European Union is limited, amounting to an average of 250 000 quintals or 4.5% of the total quantities imported.

With regard to barley, the European Union is Morocco's main supplier with almost 4 million quintals (63% of imports), whereas the rest of the world supplies almost 2.3 million quintals on average each year. Looking at individual countries, France supplies the largest volume of imports (37%) followed by Turkey (13.5%), Ukraine (10.2%) and Russia (9%). Maize imports come essentially from the US with a contribution of 53% of total imports, which amount to an average of almost 5 million quintals. Other countries such as Argentina, Brazil and Hungary supply practically all of the remaining quantities imported.

Import prices are generally lower than transfer prices. However, assessment of the difference must be qualified in view of the instability of international prices, supplies under preferential agreements and market distortions due to the export subsidies granted by certain countries of origin. The opportunities for futures buying are also difficult for importers to manage because of the difficulties in forecasting the national supplies of the main cereals.

### **3.2.4 - Processing**

Cereals are processed in a production infrastructure composed of two types of milling plants and semolina factories, which are absolutely privately run. The milling plants in the first category are referred to as industrial plants and are composed of almost 170 production units with a total processing capacity of 65

million quintals (Ministry of Agriculture, 2000). The distribution of these industrial mills throughout Morocco is extremely uneven and they are located at a considerable distance from the production areas. Over 70% of these mills are located on the Casablanca-Kenitra axis. This high concentration of location has certain negative effects, which are reflected by a capacity utilisation rate of no more than 65% of total capacities.

The second category of processing units is made up of an estimated 10 000 small traditional mills, which contribute significantly to covering the cereal product needs of consumers. Jouve & al (1995) estimate that these units are still very active in the field of custom milling, performing almost half of the crushing of all cereals, particularly durum wheat, in a normal production year. The fact that they can keep going is to be explained by the fact that they are better equipped to satisfy consumer preferences and to recover byproducts (bran in particular). However, in the new context of liberalisation and competitiveness action to improve the quality and packaging techniques of industrial mills could influence these preferences and bring an increase in demand for industrial products.

In the period between 1990 and 2004, the industrial mills crushed an average of just over 28 million quintals of common wheat and just under 4 million quintals of durum wheat, i.e. 70% and 26% respectively of the available quantities of these commodities (Table 3.3). Whereas the industrial processing of common wheat remained virtually constant during the period under review, that of durum wheat increased after the year when imports were liberalised, amounting to 30% of the quantities available in 2004.

**Table 3.3 - Common and durum wheat processed in industrial plants (expressed in 1000 quintals and as a percentage of the total quantity available)**

Period	Common wheat		Durum wheat	
	quantity	%	quantity	%
1990-1995	24668	69,0	1786	19,5
1996-2004	30229	70,0	4934	30,3
2003-2004	32509	60,0	5669	21,0
<b>1990-2004 average</b>	<b>28243</b>	<b>70,0</b>	<b>3810</b>	<b>26,0</b>

Source: ONICL (inter-professional office for cereals and leguminous plants) (2005).

It must be pointed out, however, that 71% and 23% of the quantities of common and durum wheat crushed are imported. The bulk of the quantities of durum wheat crushed is thus processed in traditional mills, which operate mainly in rural areas and working-class urban districts.

### **3.2.5 - Organisation of the profession**

Although a number of regional associations of cereals producers have been set up, there are organisational problems in the cereals sector due mainly to weak marketing infrastructures and the very large number of small producers. Furthermore, the membership of the 11 Moroccan Agricultural Cooperatives (CAM) established in the cereal-growing regions is still limited. However, the measures taken recently to restructure these organisations and to improve their financial situation have been combined with efforts to raise producer awareness and encourage producers to join the cooperatives. Furthermore, the CAM are organised at the national level in a National Union (UNCAM), which represents them in relations with the public authorities and takes part in invitations to tender for cereals imports. The aim is in fact to improve their bargaining power in relations with all of the partners in the cereals chain in view of the new liberalisation conditions.

At the agro-industrial stage all milling plants are affiliated to regional associations belonging to the National Milling Federation (FNM) pursuant to Act no. 12/94 on the ONICL (national interprofessional office for cereals and leguminous plants). These associations are active in production areas but seem to be much more preoccupied with their internal functioning and their relations with the ONICL to the detriment of inter-trade considerations at the various stages in the cereals chain.

### **3.2.6 - Consumption**

#### **3.2.6.1 - Technical characteristics of demand**

The survey on household living standards conducted by the Directorate for Statistics in 1998-1999 shows that the demand for agro-food products has increased both in quantity and in quality for various reasons including population growth, higher incomes and the growing participation of women on the labour market. The same survey shows that expenditure on cereals and cereal products accounts for almost 19.5% of household food expenditure (Directorate for Statistics, 2001).

The total demand for cereal products rose from 28 million quintals in 1960 to over 100 million quintals in 2004. Annual per capita consumption is currently around 320 kg. Direct consumption accounts for just over two-thirds of this quantity, essentially in the form of common and durum wheat flours. The quantities of these commodities that are consumed amount to 65% and 20% of cereals intake respectively. Indirect consumption concerns barley and maize, which are used for producing animal products (meat, dairy products, etc.).

Analysis of the evolution of the consumption of the various cereals reveals an increase in the demand for common wheat, whose share has grown from 27% in

1960 to almost 65% at the present time. This increase, which has been registered since the early 1980s, is apparently related mainly to the substitution of durum wheat in rural areas and to the maintaining of consumer assistance for so-called national common wheat flour.<sup>3</sup> The self-sufficiency coefficient for common wheat is still average, however, 55% of the needs of the population being covered in the 2000-2004 period.

### 3.2.6.2 - Consumption projections

According to the Ministry of Agriculture (2000), total cereals demand could amount to 137.5 million quintals by 2020 on a nutritional basis for a population of 40 million inhabitants (Table 3.4). This calculation takes account of the human needs which food intake must cover in terms of both quantity and quality at the lowest possible cost.

Demand for common wheat and for durum wheat would constitute almost 33% and 23% of total projected consumption. On the hypothesis of a national output level of 105 million quintals, the ratio of output to consumption needs could increase from the present 59% to just over 76% by 2020. It must be pointed out, however, that with the liberalisation of the Moroccan economy and the opening of access to foreign cereals imports the projected ratios are difficult to achieve. The cereals industry should nevertheless step up production efforts in the agro-support industries with a view to supplying national milling plants with local commodities.

**Table 3.4 –Projections of the production and consumption of the main cereals (1000 quintals)**

Commodity	Current situation (2000-2004)			Projection 2020		
	Output	Demand	Rate of coverage	Output	Demand	Rate of coverage
	1000 quintals		%	1000 quintals		%
Common wheat	24 600	45 000	54.7	31 570	45 100	70.0
Durum wheat	14 600	21 000	69.5	24 960	31 200	80.0
Barley	20 500	26 000	78.8	45 000	50 000	90.0
Maize	1 400	11 000	12.7	3 360	11 200	30.0
<b>Total</b>	<b>61 100</b>	<b>103 000</b>	<b>59.3</b>	<b>104 890</b>	<b>137 500</b>	<b>76.3</b>

Source : Ministry of Agriculture (2000a); ONICL (2005); our calculations.

On the other hand, the liberalisation of marketing channels should result in a wider choice of products offered for sale on the market with much more desirable quality standards for consumers. The evolution of consumption as a whole is liable to be less proportional, however, than that of incomes. For according to the

<sup>3</sup> See section on price policies for an explanation of the subsidisation system.



Directorate for Statistics (2001), the income elasticity of the demand for cereals and cereal products – estimated according to *the model of the almost ideal system*<sup>4</sup> on the basis of a sample of 5 184 households – is around 0.65%. Consequently, the increase in the consumption of these products in the future would be much more related to the evolution of population statistics and should also depend on the use of cereals in other production sectors including animal husbandry to satisfy needs other than those of direct consumption.

### **3.3 - Historical overview of cereal price policy**

Agro-food policy in Morocco takes account of both food security constraints and macroeconomic constraints, and more specifically those related to equilibrium in the balance of payments. Import substitution products in general and cereals in particular have always enjoyed massive State intervention ever since the country's independence. However, since structural adjustment programmes were introduced in the mid 1980s the intensity of this intervention has progressively diminished.

#### ***3.3.1 - Recapitulation of the main instruments of the interventionist system***

During several economic plans following Morocco's political independence, cereals production policies remained geared to the modernisation of production systems and control of the functioning of the industry. The "Operation Ploughing" that was launched between 1957 and 1961 already aimed to boost cereal growing and modernise the sector by mechanising tillage and involved the direct intervention of the local Ministry of Agriculture departments (Tilling Centres in particular). This operation was then followed by intensification schemes based on the use of breeders' seed, fertilisers and pest control products. During the 1960s the producer prices of cereals were fairly low, however, contrary to the spirit of the policy of recovery pursued at the time. With galloping population growth imports steadily increased and Morocco very soon became a net structural importer of cereals.

Then towards the mid 1970s a new line of policy emerged aiming to support consumers and leading to the compartmentalisation of the supply and demand for primary agricultural commodities. The increase in the cost of cereals due partly to the 1973 raw materials crisis subsequently refocused public policies and clear precedence was given to aid to consumption. At the same time, the State invested considerable financial efforts in measures to seek self-sufficiency in the production of staple commodities. As is underlined by Jouve & al (1995), this situation then

---

<sup>4</sup> Almost Ideal Demand System of Deaton & Muellbauer.

led to an ambivalent cereals production system in which imports provided the bulk of cereals intended for meeting the needs of the urban population, whereas national production was intended essentially for self-supplier consumption. The creation of the ONICL in 1973 to replace the national interprofessional cereals commission (OCIC) was accompanied by new legislation regulating prices throughout the cereals chain.

Producer and consumer price fixing was thus central to the regulation of markets by the public authorities, which bore the risk of variations in world prices. To a certain extent this systematic intervention in the functioning of markets discouraged investment and efforts to develop certain fundamental activities in marketing channels. Storage activities outside the official ONICL circuit thus remained very hesitant. Similarly, there was simply no such thing as the emergence of importing traders using futures and the risk management tools associated with them, since the Moroccan market is essentially a physical market. On the contrary, the regulation of imports and the guarantee that commodities would be marketed in the country encouraged the emergence of a situation of rent-seeking, particularly in the case of industrialists (Ait El Mekki, 2000).

### ***3.3.2 - Reforms carried out in the context of the structural adjustment programmes***

The range of public measures for intervening in the operation of the staple commodity sectors had contributed to a particularly and disastrous economic situation by the beginning of the 1980s. In 1983, the government had to implement the first structural adjustment programme (SAP) in collaboration with the World Bank and the International Monetary Fund. The aim was to restore the major economic balances in the short and medium term by improving the incentive system (elimination or reduction of subsidies), improving productivity and building up the capacities of private institutions. The economic and social importance of the agricultural sector then warranted the introduction of agricultural structural adjustment programmes (ASAP) from 1989 onwards. The main reforms undertaken in the context of the ASAP focused on deregulating the various subsectors and opening them to the world market.

#### **3.3.2.1 - Deregulation of the producer and consumer prices of cereals**

The main objective targeted within the framework of ASAP I, which was launched in 1985, was to liberalise marketing channels and gradually eliminate the subsidisation of agricultural inputs. Fertiliser subsidies were thus reduced for the first time in 1986 before being completely eliminated in 1991. The prices of this input thus rose by 50% during that period, and, once liberalised, fertiliser imports followed the trend of world rates. Cereal seed subsidies were frozen between 1985 and 1988 in nominal terms. The amounts of the subsidies were evaluated during that period at 45 and 20 dirhams per quintal of seed for common and durum wheat respectively.

In 1988, the cereals harvests were relatively good with a total volume of 78 million quintals, almost 29% of which was constituted by common wheat. So it was not surprising that a drop of 11.5 million quintals was registered in imports the following year. There was thus a considerable decrease in import duty revenue, whereas the subsidisation of flour consumption remained stable. The conditions registered in that special year were consequently one of the factors which induced the government to introduce reform policies. The support prices for barley, durum wheat and maize were thus eliminated as of the month of August 1988, and importers of those commodities had to obtain import authorisation from the ONICL.

The public authorities introduced two main reform measures at consumption level: the first was to fix the subsidy on 10 million quintals of so-called national common wheat flour in 1989<sup>5</sup>, and the second measure led to the elimination of the subsidy on so-called luxury flour in 1990. However, the price of that flour was still the subject of agreements on price restraint between the State and producers so as not to prejudice consumer purchasing power.

### 3.3.2.2 - Revision of protection measures

Before the second ASAP was introduced in 1987, quantitative restrictions constituted the bulk of cereal protection measures. The programme in question replaced these restrictions with a reference price system based on mobile averages of world prices and with the application of tariff equivalents. The concept of international market reference prices was intended to help to integrate the cereals sector into the world market. The Foreign Trade Act (no. 13/89) thus allowed the principle of the liberalisation of imports and exports from the late 1980s onwards while granting the right to protect national production. At the same time, the World Bank recommended that Morocco eliminate the major distortions in the reference price system in order to allow the private sector to seek the best value for money. With regard to producers, as well as recommending a complete overhaul of the statutes of the ONICL<sup>6</sup>, the World Bank also recommended measures to build up the capacities of producer organisations so that they could play their role to the full in the dissemination of information and in dialogue with the authorities (World Bank, 1994). Then, with regard to the replacement of quotas and import licences by tariff protection, an Order of the Ministry of Foreign Trade of 19 April 1994 cited the rules for applying tariff equivalents to strategic agrifoodstuffs including cereals as of the first quarter of 1995 (Centre Marocain de Conjoncture [Moroccan economic observatory], 1995).

---

<sup>5</sup> The industrial milling plants manufacture two types of common wheat flour. So-called luxury flour contains in particular a lower amount of bran than the so-called national flour, which is intended for poor population groups.

<sup>6</sup> This overhaul was then regulated by Act no. 12/94 on the ONICL.

All of these measures have currently been included – sometimes with more marked adjustments – in the negotiations of the World Trade Organisation and in the negotiation of bilateral agreements, in particular with the European Union and the United States.

### **3.4 - Current price policy and trade system**

After the structural adjustment programmes and the signing of the *Uruguay Round* agreements, the complete deregulation of the cereals sector was postponed several times due to the socio-economic importance of the commodities concerned. But deregulation was finally brought about in accordance with the provisions of Order no. 1800-95 of the Ministry of Foreign Trade of 26 June 1995 (Official Gazette of 1 July 1995), which announced the abolition of all cereals import licences as of 1 May 1996. Since that date cereals policy has been tending more and more towards opening the entire production chain to competition. The following sections review the principal features of that policy, beginning with the objectives pursued and then highlighting the various instruments connected with the production, marketing, protection and consumption of cereal products.

#### **3.4.1 - Objectives of cereal price policy**

The main objectives of cereals policy currently focus on the following issues:

- making agricultural production more efficient while safeguarding the incomes of cereals producers,
- revising the consumer assistance schemes, thereby taking account of food security constraints, and
- stimulating the industry throughout the cereals production chain.

These objectives are pursued against a background of efforts to strengthen the foothold of the cereals industry on the world market and compliance with Morocco's commitments to its trade partners. For it has been recognised politically that measures to liberalise the agricultural sector in general and the staple commodities industries in particular should offer the Moroccan agro-food economy new prospects for more efficient allocation of resources. This also applies to the cereals sector, despite certain quantitative restrictions still applying to imports, particularly common and durum wheat imports.

#### **3.4.2 - Agricultural production**

The main measures relating to the agricultural production of cereals concern in particular seed prices, producer prices for common wheat, and programmes for improving production security.

### 3.4.2.1 - Seed price support

The subsidisation of certified cereal seed aims to encourage producers to use it and thus to improve per hectare yields. The level of subsidies granted depends on the constraint of Agricultural Development Fund (ADF) balance; it is generally between 5% and 20% of the per quintal sales prices. For the 2004-2005 farm year the support paid for the use of certified cereal seed (R1 and R2) amounted to 100 Dh/ql for common wheat, 80 Dh/ql for durum wheat and 95 Dh/ql for barley (Laassiri & Lakhal, 2004)<sup>7</sup>. In the case of seed producers the ADF covers storage costs at a rate of 5 Dh/ql/month for a maximum term of 9 months. The quantities of seed concerned amount to 220 000 quintals distributed in proportion to the sales of approved operators.

These interventions are part of the National Seed Plan, which aims to strengthen the profitability of both the seed sector and the cereals sector as a whole. This plan takes account of the new biodiversity requirements (Plant Varieties Act) and the organisation of the profession in the various subsectors. The volume of the total amounts granted (production and use) generally ranks second or third after the development of properties and the equipment of farms. Amounting to almost 47 million dirhams each year on average, support for breeders' seed production and use has accounted for almost 15% of the annual budget of the ADF over the last five years. It must be noted, however, that the extent to which certified seed is used is still very inadequate. The utilisation rate in fact does not exceed 11% for all cereals together, with a rate of 24% for common wheat, 13% for durum wheat and 1% for barley (Ministry of Agriculture, 2003). The main reasons cited concern the lack of funding, the relatively high cost of seed, and sometimes the fact that seed is not available on the market despite the efforts made by the SONACOS (national seed marketing company).

### 3.4.2.2 - Producer price support

The producer prices of durum wheat, barley and maize have been liberalised and are thus determined according to market conditions. Common wheat production has been subject to a support price fixed at 250 Dh/ql since the 1994-1995 farm year. This fixing normally targets the quantities intended for the production of national flour from the standard quality common wheat delivered to the utilisation centres (ONICL, 2004). Apart from this marketing channel, which is considered the official channel, the producer price for common wheat also varies according to the law of supply and demand.

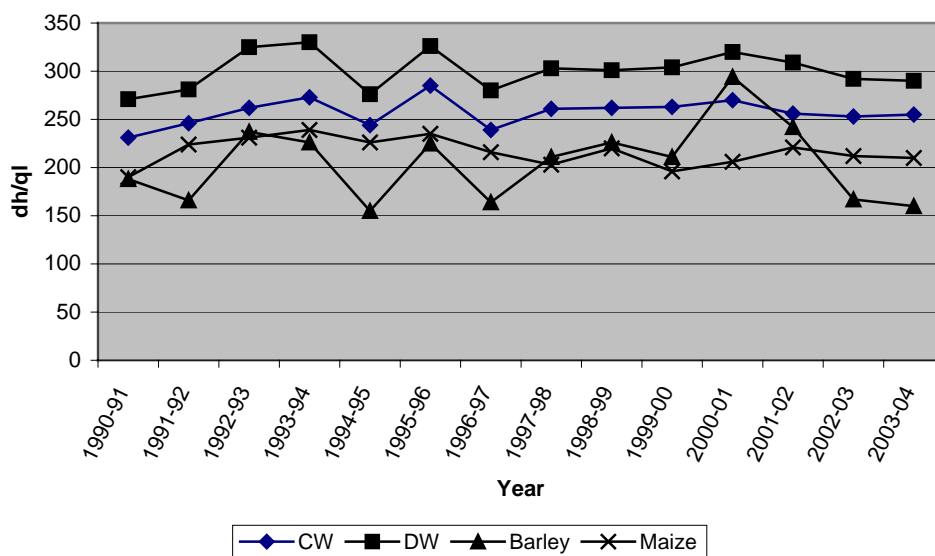
Figure 3.3 shows the evolution of the prices registered in souks and grain markets by the ONICL departments for the major cereals in the 1990-2004 period, during

---

<sup>7</sup> Laassiri M. & Lakhal M. (2004) - Aides financières accordées aux investissements agricoles (*Financial support for agricultural investments*). Ministry of Agriculture; Directorate for Training, Research and Development.

which the average price of common wheat was around 257 Dh/ql. The price of durum wheat is still more expensive in relative terms, averaging 300 Dh/ql. The average prices of barley and maize, which are used mainly in animal feed, are 205 Dh/ql and 216 Dh/ql respectively.

**Figure 3.3 - Evolution of the prices of the major cereals (1990-2004)**



Analysis of the data in this figure reveals relative price stability despite a slight upward trend from the year when imports were liberalised (1996) onwards. The double import tariff systems certainly played a major role in maintaining this stability for the benefit of agricultural producers<sup>8</sup>.

In the case of common wheat, maintaining the support price at the level of the price in the industrial channel means that producers are in a better position to make reasoned crop choices. This price is a theoretical average price paid as a lump sum to producers throughout the country. It does not take account of any regional variation in production costs and is therefore a means of promoting economically efficient production techniques to a greater extent than others. This political measure accentuated the importance of prices as the main production incentive, particularly since producers have the guarantee that their crops will be purchased, in particular by the Moroccan agricultural cooperatives.

<sup>8</sup> See section on imports below.

### 3.4.2.3 - The scheme for enhancing production security

This scheme was launched during the 1999-2000 farm year with a view to compensating for the inadequacies of another cereals production guarantee programme, which had been running since the 1994-1995 farm year. As its name indicates, it aims essentially to reduce the effects of drought, which has become a structural phenomenon for the agricultural sector in Morocco. The objective is to implement an action plan with which an output level of 16 million quintals can be guaranteed on 300,000 ha of cereals, irrespective of the weather conditions prevailing during the farm year, even in a year of drought, by:

- adopting a technically efficient cultivation itinerary, possibly using complementary irrigation,
- encouraging producers to take out agricultural insurance on their cereals production, and
- organising training sessions for producers and agricultural technicians with a view to improving their technical expertise.

The insurance system linked with the measures to enhance cereals production security has been designed by the Ministry of Agriculture, the Ministry of Finance, the Crédit Agricole (agricultural credit bank) and the Mutuelle Agricole Marocaine d'Assurance (MAMDA) (Moroccan agricultural mutual benefit insurance company) for three types of technical itineraries (traditional, intermediate and intensive). It provides a means of covering direct production costs rather than production itself linked to yields, which can vary between 7.5 ql/ha and 24 ql/ha. The premium paid by farmers is subsidised 50% by the State. During the period from 2000 to 2004, the insurance support scheme cost almost 42 million dirhams on average each year for a cereals acreage of around 230 000 ha.

According to the Ministry of Agriculture (2002), the production security scheme achieved satisfactory results particularly in the regions where the regional offices for agricultural development operate. Improvement of technical itineraries has been observed, particularly as regards the mechanisation of tilling and the use of certified seed.

In the final analysis, the drought insurance is the main contribution of the production security scheme, despite the constraints of budgeting and of the monitoring and assessment of the action carried out, which have been observed since the scheme was launched. A growing number of producers are adopting the insurance system in connection with the loans contracted at the beginning of the farm year.

### **3.4.3 - Marketing of national output**

The cereal marketing season begins around the first week in June each year. The CAM and the souks play the main role in supplying the mills. The collection and marketing of commodities can concern the industrial milling industry or the traditional mills, which are particularly active in rural areas and in the working-class districts of urban centres. The ONICL is responsible for monitoring the marketing season as a whole, however, and it is much more demanding in the industrial sector.

#### **3.4.3.1 - Internal trade system**

Market organisation, which was governed by the Dahir with force of law of 24 September 1973 and by the relevant implementation instruments, has been changed as the result of the reforms carried out in the marketing of cereals. The Dahir had laid down the rules for commercial transactions in the cereals and legumes sector and had established the mandate of the ONICL as well as the financial compensation system introduced by the public authorities for common wheat flour. Act no. 12/94 repealed those instruments in order to bring legislation into line with Morocco's new commitments in the liberalisation of the cereals sector. The main features of the new law focus on two essential issues: the establishment of a new system for organising the cereals market on the one hand and the revision of the mission of the ONICL on the other. The cereals trade has been liberalised pursuant to this law, which was passed in 1995, but the ONICL still retains a decisive role, particularly with regard to monitoring the cereals sector in general and the common wheat sector in particular.

At the present time, cereal producers can deliver their commodities to cooperatives, private traders or directly to mills. The commodities delivered are subject to a marketing tax levied by the ONICL to help to cover its expenditure, in particular storage costs. By virtue of a decree of 30 June 1996, the level of the tax has been fixed as of 1 July 1996 at 1.9 Dh per quintal of common or durum wheat and 0.80 Dh per quintal of other cereals. It is levied at the level of the processing industry.

#### **3.4.3.2 - Performance of the main cereals on the market**

Cereals marketing varies according to two main criteria – the importance of the commodities in the various regions and self-supplier needs at farm level. It is difficult to evaluate the shares allocated to marketing since sales are transacted on a virtually occasional basis, particularly on the part of small and medium-sized farms. Marketing by such farms can in fact be spread over the entire farm year following a harvest, depending on liquid asset needs and the forecasts of possible yields for that farm year. However, it is estimated on the basis of the results of a survey conducted by the Ministry of Agriculture on cereals marketing in 1998 that only 20% of farms market part of their cereals output (Ministry of Agriculture, 1999).



Furthermore, the ONICL estimates that during the period from 2000 to 2004 the share of cereals marketed in the industrial channel amounted to an average of 21% of total cereals output (Table 3.5). The rest of agricultural supply is marketed in the traditional milling channels or consumed by the producers themselves. Traders account for an average of 50% to 55% of the quantities marketed, followed by cooperatives and mills, which account for equal shares (ONICL, 2003 and 2004). Common wheat and maize are the cereals most concerned, 44% and 11% of output being marketed on the industrial market respectively. The shares of durum wheat and barley that are marketed in that channel are very low and do not exceed 2% of national output.

**Table 3.5 – Marketing of the major cereals in the industrial channel (2000-2004)**

Commodity	Quantity produced	Quantity marketed	
	1000 quintals	1000 quintals	%
Common wheat	25 219	9 670	44
Durum wheat	12 718	168	2
Barley	17 316	103	1
Maize	1 275	108	11
<b>Total</b>	<b>56 528</b>	<b>10 049</b>	<b>21</b>

Source: ONICL (2005); our calculations.

With regard to the marketing of common wheat, it is observed that the elasticity of supply was insignificant compared to the support price. Intervention in the price of this commodity thus constitutes income support for farmers and has no effect on the quantities supplied. Conversely, supply in the industrial sector would be stimulated by good rainfall conditions. For a 10% improvement in rainfall compared to the annual average would increase the quantity sold to milling plants by just over 13% (Ait El Mekki, 2000). Consequently, farmers' response to supplying mills would be guided essentially by the level of annual rainfall in production areas and in particular in areas of rain-fed agriculture where rainfall is favourable.

#### 3.4.3.3 - The storage system

The total capacity for storing cereals using appropriate modern techniques amounts to almost 25 million quintals, almost one-third of which is stocked by industrial mills (Ministry of Agriculture, 1999). The storage infrastructure is not only inadequate compared to the quantities available each year but also suffers from poor geographical distribution, which can generate additional transport costs. The facilities are often located in major urban centres, and there is sometimes and glut in supplies, and the commodities are consequently stocked in the open air.

In the project for reforming cereals marketing in Morocco (PRCC) it was considered that there were numerous opportunities for investing in the storage infrastructure. The analysis of this project by Wilcock & Salinger (1994) induced the Moroccan government to give real precedence to resolving the storage problems in cooperatives and facilitating and encouraging private investment initiatives near production centres. The ADF currently awards a grant for building and equipping grain storage units (outside port activities), which ranges from 100 Dh to 150 Dh per tonne depending on the capacity of the storage unit to be built.

In addition, in the case of common wheat intended for the manufacturing of so-called national flour, the ONICL grants cooperatives and cereal traders a warehousing, maintenance and management premium fixed at 2 Dh/ql per fortnight. Furthermore, the ONICL pays the stocking organisations a resale premium fixed at 8.80 Dh/ql, which brings the price of resale to the industrial milling plants up to 258.8 Dh/ql. In the allocation of wheat to the milling plants, the programmes set up by the ONICL are taken into account according to the size of the quotas they are granted. It must be pointed out that what is known as a security stock of common wheat has been introduced by the ONICL amounting to a volume of 5 million quintals. It corresponds theoretically to a quantity which would cover crushing needs for a period of 3 months.

### **3.4.4 - Import trade system**

Since the liberalisation of imports in 1996, the cereals tariffing system has been changed several times as the result of the requirements of the domestic market and WTO commitments. In all cases the system is based on double tariffs on the Cost, Insurance and Freight (CIF) price, account being taken of a lower limit established by the authorities for each commodity (floor price) and of a price targeting producers within the country. A basic rate and an additional rate are then applied according to the value of the floor price and the registered price. Simply applying an ad valorem tariff to imports would in fact have inevitably resulted in the accentuation of domestic price fluctuations following variations in the world rates. This type of possibility is not yet on the agenda, particularly as far as common and durum wheat are concerned, for which domestic price stability is still sought for socio-economic reasons.

The cereal protection system varies according to whether imports fall under the most-favoured-nation (MFN) regime of the WTO or under bilateral agreements signed with partner countries, in particular the European Union (EU) and the United States (US).

#### **3.4.4.1 - Protection within the WTO framework**

The current data on the system for protecting the four major cereals within the MFN framework of the WTO are set out in Table 3.6. Comparison of these data with the data on tariffs which should be bound reveals that the differences are great and

thus reflects the degree of actual commitment to access to the Moroccan market in the multilateral context.

**Table 3.6 – The cereal protection system in the multilateral context (2004)**

Commodity	WTO commitment				Protection applied		
	Basic tariff	Bound tariff	Tax	Total tariff (2004)	CIF floor price	Basic tariff	Additional tariff
	%				Dh/T	%	
Common wheat	190.0	144.0	15.0	159.0	1000.0	135.0	2.5
Durum wheat	224.0	170.0	15.0	185.0	1000.0	75.0	2.5
Barley	148.5	113.0	7.5	120.5	800.0	35.0	2.5
Maize	160.5	122.0	7.5	129.5	800.0	35.0	2.5

Source : Customs Department, ONICL (2004).

The value of the final tariff applied to cereal imports thus varies according to the variation in the world rates. Where the registered CIF price is lower than the CIF floor price, the import duty corresponds to the basic tariff. Where it is higher, an additional duty is levied on the slice above the floor price, and this generates a unit return on the final customs tariff calculated according to the following formula:

$$\begin{aligned} \text{Return on final tariff (in dirhams)} = & \text{CIF floor price} * \text{basic tariff} \\ & + (\text{registered CIF price} - \text{CIF floor price}) \\ & * \text{additional tariff} \end{aligned}$$

In the case of common wheat, for example, the CIF floor price is 1000 Dh/ql. Since the basic tariff and the additional duty are set at 135% and 2.5% respectively, the importer who pays the CIF price of 1400 Dh/T for his common wheat has to pay the Customs Department the following amount for the specific tariff equivalent:

$$\text{Final tariff} = 1000 * 1.35 + (1400 - 1000) * 0.025 = 1360 \text{ Dh/T},$$

which gives an ex-port price of 2 760 Dh/T with a customs tariff amounting to almost 50% of this price or even 100% of the CIF price. The difference between this and the tariff which could have been applied according to the WTO provisions is thus quite significant, a fact which shows the relatively high degree of openness of the Moroccan cereals markets with respect to the commitments made in the multilateral context.

When one considers the levels of the customs duties applied to imports, common wheat is still the most protected cereal with a nominal protection coefficient (NPC) estimated at 1.65 during the 2000-2003 period. It is followed by maize, for which

the NPC is around 1.50. Barley and durum wheat are the least protected cereals with respective NPCs of 1.28 and 1.12.

#### 3.4.4.2 - The preferential agreements with the EU and the US

In the context of the Association Agreement with the EU and the Free Trade Agreement with the US, Moroccan cereals imports enjoy preferential treatment, which differs according to the commodities concerned (Table 3.7).

Common and durum wheat are subject to tariff quota restrictions, whether they are imported from the EU or from the US. Over-quota imports will continue to be governed by the MFN tariff. The importing of quotas is subject to a procedure of invitation to tender, which is fairly close to the import licensing system. This system is described in the Special Instructions (SP) drawn up by the ONICL with a view to *"defining the conditions for distributing the preferential tariff quotas for cereal and legume imports granted by Morocco in the context of Protocol no. 3 of the Association Agreement concluded with the European Community on 5 December 2003"*. The quotas in question are allocated by means of an invitation to tender for imports at preferential tariffs in return for the payment of a compensatory levy by the importers. This levy is intended on the one hand to help to reduce the forgone revenue resulting from the tariff quota restrictions, and, on the other hand, to help to protect national production indirectly. No preferential measure is granted for the import of either of these two commodities during the months of June and July.

**Table 3.7 – The preferential cereal protection system  
in the context of the bilateral agreements with the EU and the US**

<b>Commodity</b>	<b>Association Agreement with the EU</b>	<b>Free Trade Agreement with the US</b>
Common wheat	Tariff quota of between 400 000 T and 1 060 000 T depending on the volume of national output 38% reduction of the tariffs applied to the quotas. No preferential measure during the months of June and July.	Tariff quota of between 280 000 T and 700 000 T depending on the volume of national output and increasing to 400 000 T and 1 060 000 T respectively after 10 years 38% reduction of the tariffs applied to the quotas. No preferential measure during the months of June and July.
Durum wheat	Annual tariff quota of 5 000 T. 25% reduction of the tariffs applied to the quotas. No preferential measure during the months of June and July.	Tariff quota of 250 000 T in the first year, increasing by 10 000 T each year. 25% reduction of the tariffs applied to the quotas during the first 4 years, followed by the reduction of the remaining 75% over the following 6 years. No preferential measure during the months of June and July.
Barley	Tariff quota of 100 000 T with a 20% reduction of import duties.	Reduction of the MFN duty over 15 years in equal slices.
Maize	Tariff quota of 2 000 T with a preferential rate of 2.5%.	50% reduction of the MFN duty the first year and 50% reduction over the following 5 years in equal slices.

Source : European Commission; US Department of Agriculture (USDA) (2005).

In the case of common wheat, the import quotas are determined according to the levels of national output, ranging from a minimum of 280 000 T to a maximum of 700 000 T within the framework of the Free Trade Agreement with the US. The import quotas will have to increase, however, during a 10-year transitional period in order to reach the levels agreed with the EU, i.e. between 400 000 and 1.0 6 million tonnes. Thus, if the harvest is higher than or equal to 3 million tonnes, the sum of the quotas from the EU and the US can amount to 680 000 T during the first year in which the agreement with the US enters into effect and 800 000 T after the 10th year. Conversely, if the harvest does not exceed 2.1 million tonnes, the sum of the quotas can amount to 1 760 000 T and 2 120 000 T respectively.

In the case of durum wheat, the free trade agreement with the US makes provision for a quarter of 250 000 tonnes with an annual increase of 10 000 T. This quota is lower in the context of the Association Agreement, being fixed at only 5 000 T each year. The sum of the quotas from both trade partners could amount to 345 000 T once the agreement with the US has been in effect for 10 years.

With regard to barley and maize, imports from the US will enjoy total exemption from customs duties after a transitional period of 15 years for barley and 6 years for maize. The Association Agreement with the EU, on the other hand, makes provision for annual tariff quotas of 100 000 T for barley with a tariff reduction of 20%. In the case of maize, this agreement introduces a quota of 2 000 T, which is subject to an import duty of 2.5%. As is the case with common and durum wheat, over-quota imports of barley and maize are subject to the MFN duty.

### **3.4.5 - Consumer assistance**

Consumer assistance concerns national common wheat flour for a quota fixed at 1 million tonnes managed by the ONICL. This quota is opened to competition by means of an invitation to tender addressed to milling plants according to the provisions of the interministerial circular of 31/7/1996, which defines in particular the obligations of the various actors. The volume that is subsidised is distributed throughout Morocco according to regional quotas established by provincial committees.

The subsidy on national flour is estimated at 1 430 Dh/T, i.e. almost 44% of the cost price. The share of this subsidy has steadily increased since 1975, when it amounted to only 4% of the price received by the milling plants. Even if the price is officially fixed at 2 000 Dh per tonne of national flour, the pressure of excess demand leads to price increases of up to 35%. Furthermore, the national flour production and marketing system has always been described as fertile ground for fraudulent practices concerning the quality of the commodity. Supplies of poor quality grain and the application of crushing rates sometimes close to 90% are often cited as means used by millers to maximise their profits. The fixing of the price of bread manufactured with national flour also impedes the efforts to improve quality at bakery level.

In these circumstances, the subsidisation of the consumption of national common wheat flour creates an environment of speculation, which develops as soon as the commodity leaves the mills. Theoretically, the millers themselves, wholesalers and retailers should all benefit from the revenue related to the quota restrictions. The fact that needy population groups are not the exclusive target further exacerbates the inefficiency of the subsidisation system as a whole, since all consumers, including the most wealthy, can obtain supplies of this type of flour and bread at the subsidised price.

### **3.5 - Conclusions and recommendations: what should be the line of cereals policies in the future?**

The Moroccan cereals industry has gone through several successive stages as political, economic and even climatic factors have evolved. After a long period of State intervention in production and consumption a phase of disinvestment was initiated within the framework of the structural adjustment programmes, involving in particular the establishment of a new vision of national production support and protection. In the course of these two phases the cereals production system was structured as the result of the policies pursued and the intensification programmes, which eventually led to **a marked imbalance in favour of common wheat production.**

Since the year when imports were liberalised (1996), the cereals sector has been at a decisive crossroads. With the WTO commitments and bilateral agreements on the one hand and the burden of structural and socio-economic constraints on the other, the mission of the administrative officers in charge of the sector, who are called upon to respond to the concerns of producers regarding the future of the industry, is no easy task. The last Free Trade Agreement signed with the US complicates this mission further in view of the importance of that country on the world cereals market.

Morocco's commitments to its trade partners do, of course, open new horizons for the economic efficiency of the country's agro-food production systems. They require a new vision of the structural reforms to be carried out with a view to strengthening the foothold of the Moroccan economy on the international market. In view of the socio-economic importance of cereals these commodities must be an integral part of any deliberations conducted in accordance with the requirements of such a vision. It is also difficult to give a clear-cut answer to the questions raised, however, since it is impossible to predict how political, macroeconomic and also natural factors will change in the future. The question of how to resolve contradictory questions from producers, consumers and the State itself can only be addressed in a context of consensus, which could involve in-depth examination of the issues at stake along the following lines:

#### ***1. Regionalisation of cereals production policy***

An approach that endeavours to standardise agricultural policies cannot be efficient in the new context of the Moroccan economy. As far as cereals are concerned, the new approach must take account of the assets and constraints of the various production regions in order to arrive at an effective definition of any intervention. For the regionalisation of agricultural production must play an important role, particularly in the field of land use and the development of resources. The choice of cereals zones should be discussed again in the light of the new factors of access to the Moroccan market, and the commitments undertaken in

the context of preferential agreements must thereby be taken into account. This choice must be made on the basis of in-depth spatial studies with a view to highlighting the aspects of the profitability and economic efficiency and competitiveness of cereals in the various production regions. Measures should then be taken to consolidate the role of agronomic research, food technology and the industry throughout the cereals production chain in order to provide a sound basis for achieving better performance. The results obtained should also help to formulate proposals on alternative production possibilities which could protect producers' incomes in rural areas if cereal-growing is not economically profitable.

## ***2. Revision of consumer assistance policy***

The policy for supporting the consumption of national common wheat flour should be reviewed in view of its inefficiency in terms of the objectives pursued. Given the problems of fraud which can arise in a system of targeted subsidisation, alternative action could be taken in the context of eliminating the manufacturing quota for this type of flour. The quantities marketed could increase, and this could have a beneficial effect on consumer prices.

## ***3. Action to strengthen the industry***

If the institutional measures for steering the cereals industry are to be successful, it is imperative that steps be taken to strengthen the dialogue amongst all of the economic operators involved in this sector. They could be designed on the basis of deliberations on the regionalisation of cereals production. The establishment of regional cereal-grower committees would be an initiative which could organise the industry with a view to coping constructively with the constraints of the sector. At the same time, action should give precedence to the circulation of information in order to stimulate competition.



## ***Appended tables***

### **Appendix 3.1 - Evolution of the major cereals output in Morocco (1000 quintals)**

<b>Agricultural campaign</b>	<b>Common Wheat</b>	<b>Durum Wheat</b>	<b>Barley</b>	<b>Maize</b>	<b>Total</b>
1979-80	4 800	13 310	22 097	3 327	43 534
1980-81	2 817	6 105	10 390	897	20 208
1981-82	7 772	14 062	23 338	2 469	47 640
1982-83	7 318	12 385	12 277	2 584	34 563
1983-84	8 182	11 713	14 046	2 640	36 581
1984-85	10 166	13 416	25 414	3 210	52 206
1985-86	18 278	19 813	35 629	3 068	76 787
1986-87	13 019	11 255	15 433	2 400	42 107
1987-88	22 534	17 659	34 540	3 580	78 314
1988-89	21 604	17 665	29 986	4 028	73 284
1989-90	19 972	16 167	21 376	4 356	61 871
1990-91	27 232	22 158	32 525	3 351	85 266
1991-92	8 804	6 818	10 807	2 156	28 585
1992-93	9 417	6 313	10 268	923	26 921
1993-94	31 809	23 423	37 199	2 000	94 431
1994-95	6 520	4 387	6 077	505	17 489
1995-96	36 460	22 700	38 311	2 351	99 822
1996-97	14 349	8 816	13 242	3 745	40 152
1997-98	28 341	15 444	19 700	2 005	65 490
1998-99	13 540	7 995	14 740	1 364	37 639
1999-00	9 533	4 274	4 668	950	19 425
2000-01	22 776	10 388	11 552	536	45 252
2001-02	23 252	10 315	16 690	1 989	52 245
2002-03	35 383	18 367	26 066	1 400	81 216
2003-04	35151	20248	27603	1500	84502

Sources: Ministry of Agriculture, Directorate of Vegetal Production (2005) ; National interprofessional office for cereals and leguminous plants (2005).

### Appendix 3.2 - Evolution of the output prices of the major cereals in Morocco (dh/quintal)

<b>Campaign</b>	<b>Common Wheat</b>	<b>Durum Wheat</b>	<b>Barley</b>	<b>Maize</b>
1979-80	146	153	127	137
1980-81	163	185	147	168
1981-82	180	131	94	113
1982-83	150	181	135	145
1983-84	185	215	150	152
1984-85	182	250	153	176
1985-86	190	222	129	172
1986-87	200	236	128	174
1987-88	193	232	123	182
1988-89	211	253	129	188
1989-90	220	269	150	191
1990-91	231	271	188	190
1991-92	246	281	166	224
1992-93	262	325	237	231
1993-94	273	330	226	239
1994-95	244	276	155	226
1995-96	285	326	225	235
1996-97	239	280	164	216
1997-98	261	303	211	203
1998-99	262	301	226	220
1999-00	263	304	211	196
2000-01	270	320	294	206
2001-02	256	309	242	221
2002-03	253	292	167	212
2003-04	255	290	160	210

Source: National interprofessional office for cereals and leguminous plants (2005).

### **Appendix 3.3 - Evolution of cereal imports in Morocco (1000 quintals)**

<b>Campaign</b>	<b>Common Wheat</b>	<b>Durum Wheat</b>	<b>Barley</b>	<b>Maize</b>	<b>Total</b>
1980-81	18 210	1	1 244	1 456	18 211
1981-82	22 441	382	2 430	1 963	27 216
1982-83	13 692	0	97	1 654	15 443
1983-84	19 615	0	58	1 774	21 447
1984-85	23 049	74	1 245	1 295	25 664
1985-86	19 224	0	96	1 777	21 097
1986-87	13 124	0	0	1 901	15 025
1987-88	20 905	0	36	2 383	23 324
1988-89	13 396	0	0	1 207	14 603
1989-90	10 605	0	0	898	11 502
1990-91	17 608	411	1 649	1 612	21 280
1991-92	14 748	379	1 768	2 032	18 927
1992-93	24 942	2 506	6 111	2 676	36 235
1993-94	23 281	3 202	3 308	3 342	33 133
1994-95	7 800	288	1 629	4 622	14 339
1995-96	25 908	3 478	3 249	5 751	38 386
1996-97	11 855	3 602	294	5 591	21 342
1997-98	21 786	5 416	1 878	6 469	35 549
1998-99	20 699	4 345	9 872	6 941	41 857
1999-00	22 540	5 297	6 768	7 883	42 488
2000-01	30 036	6 712	8 242	9 129	54 119
2001-02	23 386	5 484	7 699	10 381	46 950
2002-03	22 998	5 249	4 109	8 983	41 339
2003-04	19 624	6 772	1 395	12 265	40 056

Source: National interprofessional office for cereals and leguminous plants (2005).

### Appendix 3.4 - CIF prices evolution of the major cereals in Morocco (dh/ql)

<b>Campaign</b>	<b>Common Wheat</b>	<b>Durum Wheat</b>	<b>Barley</b>	<b>Maize</b>
1980-81	92.08	114.64	93.68	85.46
1981-82	91.57	150.12	98.29	84.75
1982-83	114.14	172.88	136.21	122.47
1983-84	135.41	122.80	118.35	132.40
1984-85	125.88	126.46		131.49
1985-86	81.34	131.59		73.62
1986-87	82.35	119.76		77.33
1987-88	126.08	150.62	74.92	120.96
1988-89	143.23	97.70	77.33	110.63
1989-90	101.90	111.53	85.86	111.73
1990-91	102.74	110.95	82.71	81.84
1991-92	101.60	127.12	100.10	110.00
1992-93	113.80	130.00	98.50	100.70
1993-94	109.10	200.00	97.00	115.20
1994-95	109.90	210.50	100.20	109.30
1995-96	167.10	241.30	140.00	160.00
1996-97	150.00	222.00	131.00	141.00
1997-98	129.10	216.30	110.00	119.10
1998-99	123.90	148.90	95.00	119.20
1999-00	142.00	150.10	128.30	125.10
2000-01	162.00	148.30	137.00	133.90
2001-02	155.10	180.10	122.70	137.40
2002-03	148.00	200.20	142.30	129.80
2003-04				

Sources: Office des Changes (2005) ; ONICL (2005) ; Klonic Morocco (1993).

**Appendix 3.5 - Evolution of the IPC (Consumer Price Index)  
in Morocco (1989 = 100)**

385 items

<b>Year</b>	<b>IPC</b>
1990	107.0
1991	115.6
1992	122.2
1993	128.5
1994	135.1
1995	143.4
1996	147.7
1997	149.2
1998	153.3
1999	154.4
2000	157.3
2001	158.3
2002	162.7
2003	164.6
2004	167.1

Source: Direction de la Statistique (2005).

## **4    *Cereals policies in Algeria***

### **4.1 - Evolution of consumption and demand**

Cereals have been the main element of food intake in Algeria since antiquity; this consistency in the predominant consumption pattern is to be explained by food traditions and consumption habits. This stability in the traditional consumption pattern has been strengthened by the mechanisms that have been established and the food policies pursued.

One of the major factors of change is the steep rise in the population growth rate (3.2% since the mid 1970s) as the result of the regression in mortality rate in general and of the infantile mortality rate in particular plus the absence of any family planning measures. The population has thus grown from 10 million inhabitants in 1963 to 32 million today. It was not until 1986 that the population growth rate began to slow down (2.7%), a trend which was subsequently confirmed, so that the rate registered in 2004 was 1.75%.

A further major factor of change was the implementation of development plans with emphasis on industry from 1967 onwards. The flow of rural jobseekers to the towns and cities resulted in very rapid growth in the urban population (60% by the end of the 1990s). The swell in urban population and the sustained growth in cash incomes created favourable conditions for a radical change in the eating habits of the population.

The emphasis on industrialisation meant that housing policy was relegated to the background, at least until the beginning of the 1980s. The new “city dwellers” were thus forced to cram themselves into the fringe of towns and villages in makeshift housing or to share cramped living accommodation with relatives who had migrated to the urban areas before them.

The industrialisation policy introduced by the government was based on particularly concentrated investment efforts (30% of GDP) and on fixing wages at the lowest possible level. In order to prevent this form of labour cost control from eliciting labour demands, the State made constant efforts to maintain relative compatibility between the level of wages paid and the prices of the goods in the wage earner’s “basket”, particularly the price of food, for, as was demonstrated in consumption surveys conducted in 1967-1968, 1980 and 1988, food actually accounted for over half of the average annual expenditure of households. Those surveys estimated the share of household budgets devoted to food at 54.1%, 55.7% and 51.3% respectively.

The “traditional” consumption model was thus confirmed in view of the relative stagnation in the incomes of the majority of the working population. This did not mean, however, that the diet remained identical; on the contrary, a certain diversification of consumption was registered with a decrease in the share of cereals in the average food intake. The consumption surveys evaluated that decrease at 250 kg/capita/year in 1967-1968, then at 185.3 kg in 1980 and 175.8 kg in 1988. Furthermore, the proportions of the various cereals consumed also changed and barley virtually disappeared from the diet: 46.2 kg/capita/year in 1967-1968, 4.64 kg/capita/year in 1988 and less than 3 kg/capita/year at the present time. Durum wheat is still the primary cereal consumed, exceeding by far common wheat, which still comes second. Yet despite this diversification of consumption, cereals continue to provide 60% of the calories consumed.

The forecast of wheat demand over the next 10 years can be evaluated on the basis of the trends observed in population growth and in consumption patterns. Three scenarios have thus been constructed.

The first, which can be termed optimistic, forecasts an annual decrease in durum wheat demand of 1.5% combined with a 0.5% progression in the demand for common wheat. This means that growing urbanisation will have the effect of – slowly but surely – reducing wheat consumption in general and increasing the proportion of common wheat consumed compared to durum wheat. This first scenario also forecasts a continuing downward trend in population growth (+1.55%/year). It can thus be estimated that overall demand will amount to 6 744 million tonnes by 2015, i.e. an increase of 13.6% compared to 2003 with a per capita consumption rate of 174.8 kg.

The second scenario, which can be termed pessimistic, forecasts stabilisation of the current population growth rate (1.75%) and a very slight increase in wheat consumption (-0.5%/year for durum wheat and +0.2% for common wheat). Demand can thus be estimated at 7 175 million tonnes by 2015, i.e. an increase of 20.9% compared to 2003 and a per capita consumption rate of 181.6 kg.

The third scenario, which is considered to be midway between the first two, is based on a population growth rate of 1.65% and forecasts a drop in durum wheat consumption at a rate of 1% per year combined with a relatively low increase in the consumption of common wheat (+0.2% per year). This intermediate scenario forecasts an increase in national demand of 17.5%, which would mean a volume of 6 974 million tonnes and a per capita consumption rate of 178.6 kg by 2015.

## **4.2 - The cereal growing and production systems**

Cereals are grown on most farms, even on the smallest and the southernmost farms in the country (oasis farms). The 2001 General Agricultural Census registered 588 621 farms (i.e. 60% of the total number of farms) where cereal growing was the predominant form of husbandry. However, it is quite possible to delimit a geographical region where cereal growing clearly predominates, forming a veritable “wheat belt” surrounding the north of the country.

Three cereal zones can thus be roughly outlined from west to east according to potential yields, which are determined essentially by climatic conditions and in particular by rainfall:

- **A high potential zone** the Algerois and Mitidja coastal plains, the Issers basin, the Soummam and Wadi El Kebir valleys, the Seybouse and Wadi Cherf valleys, the Mahouna massif and the upper Medjerda basin. This zone, which has an average annual rainfall of over 500 mm, has an AAU of only 400 000 ha, less than 20% of which is devoted to cereals with averages of up to 20 quintals per hectare (ql/ha).
- **An average potential zone:** the Tlemcen mountain slopes, the Mleta plain, the upper valley of the Mina and of the Wadi Rhiau, the inland plains of the Mekerra and Ghriss, the Chelif valley, the Medea massif and the Dahra plateau. This zone, which has a rainfall of 400 mm to 500 mm but is subject to a high level of climate risk, has an AAU of 1 600 000 ha, less than half of which is devoted to cereals. Yields can range from 5 to 15 ql/ha, depending on rainfall.
- **A low potential zone:** this zone is composed of a fringe with a semi-arid climate extending more into the high plateaus in the east than in the west, since it skirts the south of the Aurès massif. Rainfall is much more changeable in this zone, the average being less than 350 mm per year, and it is generally unevenly distributed over the season. The AAU of this zone amounts to 4.5 million ha, almost half of which is sown with cereals each year. Cereal yields in this region are often below 8 ql/ha, and farmers frequently abandon their grain-sown parcels to flocks of sheep as soon as the spring rains prove inadequate.

It must be underlined from the outset that this “wheat belt” does not actually cover cereal-growing zones in the sense in which agronomists generally use the term. The configuration of the cereal-growing area is more the result of policies and historical events which are sufficiently known to all. Almost 80% on average of the country’s AAU is devoted to cereals each year. This is a fundamental fact, which by virtue of its consistency features as an invariant of Algerian agriculture. It is certain, at least as far as the last two centuries are concerned, that the predominant crop-growing system throughout the country was based on cereals/fallow crop rotation, generally on a 2-year basis. Thus, in practice, 40% to 50% of the AAU is sown with cereals each year and 30% to 40% is left fallow.



The predominant trend is undoubtedly one of continuing extension of grain-sown areas, the cereals acreage having grown from an average of 2 916 962 ha during the 5-year period from 1962 to 1967 to an average of 3 891 062 ha during the period from 1992 to 1997, i.e. an overall increase of 974 100 ha or of one-third, before dropping to 2 995 210 ha in the period from 1999 to 2004, which was 2.7% more than the initial level. Examined over the long term, the growth rate of these grain-sown areas is virtually regular, since the variation coefficient is very low (7.4%).

The average cereals output for the period from 1965 to 2004 was just over 2 million tonnes (2 095 872 T) with a slight upward trend since the 5-year period from 1965 to 1972. It must be noted that the annual growth rate is less than 0.30%, which is a mediocre performance compared to that of other Mediterranean countries (Morocco or Tunisia, for example). Within this average total output, durum wheat is the leading cereal with a share of 46%, closely followed by barley with a share of no less than 31%. Together these two cereals have consistently accounted for between 72% and 84% of total cereals output.

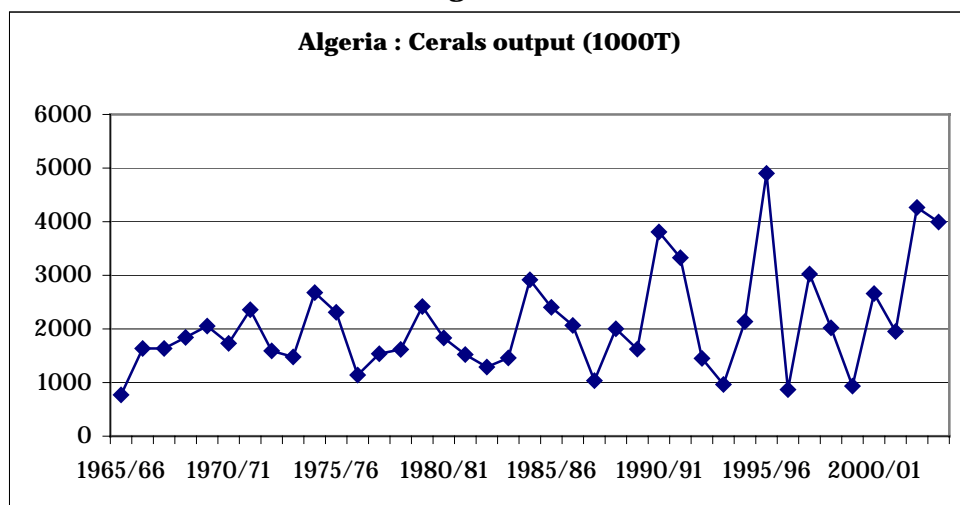
**Table 4.1 – Evolution of cereals output by species (1 000 T)**

Year	WHEAT	BARLEY	OATS	MAIZE	TOTAL
1965-66	630	130	7	3.4	770
1966-67	1 266	340	26	4.2	1 636
1967-68	1 534	538	41	6.7	2 120
1968-69	1 326	466	44	6.2	1 842
1969-70	1 435	571	42	6.4	2 054
1970-71	1 317	372	38	5.1	1 733
1971-72	1 656	644	54	4.7	2 359
1972-73	1 158	374	53	5.3	1 590
1973-74	1 091	331	50	4.3	1 477
1974-75	1 848	743	80	6.7	2 677
1975-76	1 630	589	89	2.8	2 310
1976-77	827	260	50	2.0	1 139
1977-78	1 083	397	56	1.0	1 537
1978-79	1 080	457	80	0.9	1 618
1979-80	1 511	794	110	1.5	2 417
1980-81	1 218	525	86	2.3	1 831
1981-82	977	483	60	1.4	1 522
1982-83	790	447	49	2.8	1 289
1983-84	886	503	64	5.3	1 459
1984-85	1 478	1 330	108	1.3	2 917
1985-86	1 229	1 083	89	1.4	2 402
1986-87	1 175	820	68	2.1	2 065
1987-88	614	390	30	2.0	1 036
1988-89	1 152	790	60	2.4	2 004
1989-90	750	833	41	0.2	1 625
1990-91	1 869	1 810	128	0.5	3 808
1991-92	1 837	1 398	93	0.7	3 329
1992-93	1 017	408	27	0.2	1 452
1993-94	714	234	15	0.2	963
1994-95	1 500	585	53	0.4	2 138
1995-96	2 983	1 800	117	0.4	4 900
1996-97	662	191	17	0.3	869
1997-98	2 280	700	45	0.3	3 025
1998-99	1 470	510	40	0.5	2 021
1999-00	760	163	9	1.6	934
2000-01	2 039	575	44	1.1	2 659
2001-02	1 502	416	33	0.8	1 952
2002-03	2 965	1 222	78	1.0	4 265
2003-04	2 600	1 314	78	1.0	3 993
2004-05	na	na	na	na	3500*

\* Provisional estimate of the Ministry of Agriculture

Data sources: FAOSTAT and Ministry of Agriculture

Figure 4.1



Examination of the 5-year evolution of output levels would also show continuing regression of the share of durum wheat in total output. That share – which was over half of the cereals produced in the 5-year period from 1962 to 1967 (58.3%) – has lost 21 points in less than two decades, dropping to 37% of the total in 1982-1987. In view of the very slow growth in overall cereal production, this regression is combined with a significant decrease in the quantities of durum wheat harvested (almost 900 000 tonnes in the 1962-1967 period compared to 720,000 tonnes from 1982 to 1987). This deterioration is of course due primarily to the reduction of durum wheat acreage, particularly on farms in the private sector. It is to the advantage of barley in particular, whose share in total output rose from 23.6% in 1962-1967 to 45.6% in 1987-1992. This growth in the barley share corresponds in this instance to actual growth in volume, since the average output level – 400 000 tonnes in the 1962-1967 period – was over 1 million tonnes in 1987-1992, i.e. a progression of 187%. However, since the growth rate in yield level has been very low since 1962, this means that the gain in production was due mainly to the extension of the barley-sown acreage.

The liberal reforms carried out in the agricultural sector to begin with (reorganisation of the State agricultural sector in 1987) and then throughout the national economy in the course of the last decade have reversed these trends. The reversal of the trend in the durum wheat production sector is undoubtedly the result of a second major factor: the change in price policy, which was introduced towards the end of the 1980s and resulted in an appreciable increase in guaranteed production prices – an increase which was greater in the case of wheat (both durum and common) than in the case of barley. Durum wheat consequently made a marked comeback, sown acreage increasing from 35.61% of total acreage in the

1987-1992 period to 43.78% in the following 5-year period. This increase was coupled with just as marked an increase in the volumes produced, which grew from 884 197 tonnes in the 1987-1992 period to 1 140 677 tonnes in 1992-1997. Durum wheat thus recovered its position as the leading cereal in terms of both planted acreage and output (49.1% in the 1997-2002 period).

**Table 4.2 – Evolution of cereals output by species from 1962 to 2002 –5-year averages (T)**

Period	Durum wheat	Common wheat	Barley	Total
<b>1962-67</b>	896	278	363	1 537
<b>1967-72</b>	908	546	518	1 972
<b>1972-77</b>	824	487	459	1 770
<b>1977-82</b>	748	427	531	1 705
<b>1982-87</b>	720	391	836	1 948
<b>1987-92</b>	884	360	1 044	2 289
<b>1992-97</b>	1 141	412	756	2 309
<b>1997-02</b>	922	530	426	1 878
<b>Average</b>	880	429	617	1 926
<b>Share (%)</b>	45.71	22.26	32.03	100.00

Data sources: Revue Statistique Agricole, Blue series, Ministry of Agriculture, Algiers.

How is the very low growth rate in the overall cereals output (+ 0.24% per year) – measured in 5-year averages, the only reference which makes sense in a country where the climate is extremely changeable – to be explained when grain-sown acreage is growing at an average annual rate of 0.32%?

Analysis of the statistics shows that each year an average of almost one-quarter of the grain-sown areas (813 254 ha and 23.72% for the three major cereals) is not harvested. The main reason for this strange "habit" is the changeable nature of the climate and – in most cases – more specifically the inadequate rainfall and/or the fact that it is unsuitably distributed over the season in terms of the crucial stages in the crop growth cycle. Statistical analysis also shows that there is a marked upward trend in both grain-sown and unharvested acreage, each 5-year average having been subsequently exceeded during the last four 5-year periods. In the five years from 1992 to 1997, producers even lost almost half of their grain-sown acreage as the result of two successive years of drought (1992-1993 and 1993-1994).

It must be pointed out that the continuing extension of the cereals area has been brought about to a large extent by pushing the boundaries of the cereal-growing area further south on the basis of the cultivation of land situated in the north of the steppe – semi-arid zones where rainfall is more uncertain and generally below 300 mm per year. The risk of damage is thus much greater for crop farmers, and it can be considered that it is only possible to harvest a crop in one year out of five on

average in these zones. The variation coefficient for national barley output is thus very high (+63.95%).

The reason for the continuing extension of grain-sown acreage until the end of the 1990s, despite the considerable risk of no harvest and the lack of progress in yields, was that farmers pursued a strategy which enabled them to limit the effect of climate hazards to a very large extent. Taken as a whole, the small farmer's strategy is based on the desire to reduce the risks which climate uncertainties entail for the survival of the farm, and the result is a permanent refusal to specialise. The crop-growing system farmers adopt always includes the three major cereals (durum wheat, barley, common wheat) – at least when the size of the farm allows. And the refusal to specialise also results in:

- the rejection of any attempt to introduce new varieties, particularly when they are explicitly presented as varieties which produce more grain, unless their ability to resist moisture stress and drought is guaranteed;
- the rejection of any attempt to include new species in crop rotation, whether cereals (triticale, rye, etc.) or fodder species (alfalfa, etc.);
- reluctance to practise chemical weed control in order to diminish weed seed competition, since the risk that the additional cost incurred in this additional operation will not be compensated is considered too great in view of the growing rainfall uncertainty from the early spring onwards;
- permanent hostility to using mineral fertilisers, and more specifically nitrogenous fertilisers, although they are regularly recommended by advisers. This hostility is perfectly reasonable, however, in view of the agro-climatic conditions. Using nitrogenous fertilisers does actually help to increase the production of dry matter; it has a favourable effect on yields of both grain and straw – if the total rainfall is adequate and it is appropriately distributed over the crop-growing season. This close dependence on the effects of nitrogen fertilisation with regard to rainfall makes its application to cereals a very risky bet in the actual weather conditions with which crop growers have to contend.

Their refusal to specialise also results in preference for a combination of crop and animal husbandry, which becomes the rule as soon as one leaves the southern boundaries of the so-called very high potential zones, i.e. in practice on almost 90% of the cereal-growing area. For the presence of animals has several advantages:

- it means that parcels that are considered to be damaged from the point of view of crop production can still be farmed;
- it means that the byproducts of crop growing (stubble and straw) can be developed;
- it provides the opportunity to develop fallow, integrated into the crop rotation system. The virtually total absence of mineral fertilisation forces farmers to let part of the arable acreage lie fallow and to practise crop rotation, generally on a 2-year basis, the implicit aim being to allow the land to benefit from low-cost soil

amendments. Raising a herd provides a means of benefiting from the spontaneous vegetation which grows on the parcel while it lies fallow.

But the establishment of a dual production system (crop and animal husbandry) is a very classical strategy in a country with the climate features of Algeria. What is really new since independence, and more specifically from the mid-1970s onwards, is the precedence that is gradually being given to animal husbandry. Since the production system involves crop and animal husbandry, the predominant strategy aims to maintain and increase the livestock (essentially sheep) rather than to guarantee the stability of or an increase in crop production.

Furthermore, cereal farmers are regarding producing for their own consumption less and less as a rational aim, since they know that they can easily obtain imported goods (cereals or derivatives), which are sold on the market at a lower price than what it would cost them to produce the equivalent on their farms. Where crop production is maintained this is mainly in order to have a reserve in view of fluctuating supply on the market. It is also often the only solution in view of small farmers' limited expertise, which acts as a constraint when it comes to lines of production which could be included in the crop-growing system.

The shift in the production system towards animal husbandry has the effect of considerably reducing the advances granted for growing cereals in general and wheat in particular. It significantly reduces the effort and time spent by small farmers on these crops, and this already explains to a large extent the lack of progress in yields despite the rising level of mechanisation.

In order to win their bet of producing cereals while reducing the length of time during which acreage is used for crops, farmers have to mechanise all crop-growing operations as far as possible. The fact that crop farms are obviously underequipped induces farmers to "streamline" the technical itinerary to varying degrees. This "streamlining" consists of:

- reducing cultivation operations to a strict minimum (which generally means that the seed bed is cloddy and unfavourable for plant emergence);
- continuing to practise broadcast sowing, since farmers do not have mechanical seed drills (with the result that seed density is very random);
- minimising fertiliser broadcasting even when weather and soil conditions are favourable for this method;
- dispensing with all chemical weed control operations even though the postponement – or indeed elimination – of preparatory ploughing has done away with mechanical weed control;
- accepting very late harvesting/threshing, which continues until the end of August – entailing tremendous losses (up to 30%), since the ears have been ripe for some time and tend to shell – plus the need to harvest the crops in as short a time as possible with rented equipment, with the result that farmers tend to neglect to

adjust the cutter bars of the combine harvesters to the height and density of the ears.

The implementation of the National Agricultural and Rural Development Plan, which has been running since 2000, and of the various mechanisms for encouraging farmers to convert crops, particularly in steppe regions, has begun to result in a decrease in the grain-sown acreage in the agro-climatically least favourable zones. As the result of the subsidies for promoting farm investments (agricultural equipment and in particular irrigation equipment), substantial intensification has begun in high potential zones, although the scale of this intensification is still inadequate. The appreciable progress that has been made in yields in the last five years still does not suffice to dispel uncertainties as to whether it will continue in the future in view of the climatic risk. The evaluation of local supply over the next decade will thus have to be based on very cautious hypotheses. In the three scenarios mentioned above, an annual growth rate in output of 2% was thus calculated for the optimistic scenario, 1% for the pessimistic scenario and 1.5% for the midway scenario. It emerges from this calculation that the domestic supply of wheat would be 2 119 million tonnes, 1 883 million tonnes or 1 998 million tonnes respectively by 2015. When one compares these figures with the prospects of development in demand it is observed that the so-called optimistic scenario would be the only one which would ensure a clear improvement in the ratio of local supply to demand, the rate of coverage increasing from 28.15% to 31.4% by 2015. In the pessimistic scenario, by contrast, there would be a marked deterioration in this rate, which would drop to 26.2%, and in the midway scenario there would be no appreciable change compared to the present situation.

### **4.3 - Market integration of cereal growers**

In view of what has been stated above on the spatial distribution of cereal crops and on production systems and farmer strategies, the level of market integration of all cereal growers is very high, since their behaviour is dictated by market signals. Examination of the evolution of the quantities collected by the cereals and dried beans cooperatives actually shows that these quantities are relatively small compared to the domestic cereals output, for which they have accounted for an average of 44% since Algeria's independence. The maximum level was achieved in the 5-year period from 1977 to 1982, when the volume collected amounted to 56% of the average output. However, the cooperatives have never really got anywhere near their declared objective of collecting total output.

**Table 4.3 - Evolution of wheat output and collection**

Period	DURUM WHEAT			COMMON WHEAT		
	Output(1)	Volume collected (2)	(2)/(1)	Output(3)	Volume collected (4)	(4)/(3)
	1000 T	1000 T	%	1000 T	1000 T	%
1962-67	896	411	45.86	278	175	63.03
1967-72	908	405	44.64	546	384	70.37
1972-77	824	353	42.80	487	367	75.41
1977-82	748	387	51.07	427	326	76.51
1982-87	720	292	40.57	391	259	66.17
1987-92	884	508	57.49	360	228	63.33
1992-97	1 141	431	37.75	412	208	50.60
2000-04	1 460	403	27.58	817	359	44.00
Average	948	399	42.07	465	288	62.07

Source of the annual data: OAIC<sup>1</sup>/DSAP<sup>2</sup> Consolidated balance sheets.

**Table 4.4- - Evolution of the output and collection of secondary cereals**

Period	BARLEY			OATS		
	Output	Volume collected	(2)/(1)	Output	Volume collected	(4)/(3)
	1000 T	1000 T	%	1000 T	1000 T	%
1962-67	363	106	29.28	24	2	6.17
1967-72	518	136	26.25	44	19	43.48
1972-77	459	116	25.31	64	24	37.25
1977-82	531	186	34.97	79	40	50.63
1982-87	836	230	27.46	75	30	40.38
1987-92	1 044	199	19.07	69	19	27.03
1992-97	756	71	9.34	53	8	15.03
2000-04	853			58		
Average	670	149	22.25	58	20	34.76

Source of the annual data: OAIC/DSAP Consolidated balance sheets.

The volume of wheat collected alone (both durum and common) amounts on average to over half of total output (52.48%). The share of domestic production that is not collected by the cooperatives is larger in the case of secondary cereals intended for livestock feed (barley and oats) and often accounts for more than two-thirds of the harvest. This tallies perfectly with the farmers' production strategies and is not at all surprising. So what becomes of the 600 000 tonnes of wheat that are not delivered to the cereal cooperatives? About a quarter of this volume is used for building up seed stocks. For it must be pointed out that since there are not

<sup>1</sup> OAIC: Office Algérien Interprofessionnel des Céréales – Algerian interprofessional agency for cereals.

<sup>2</sup> DSAP: Direction des Services d'Appui à la Production – Directorate for production support services.



enough seed multipliers in the country the quantities of certified seed which the cooperatives have been able to supply have always been less than one-third on average of the needs expressed by cereal growers. The remaining two-thirds of this demand has thus only been satisfied by what is known as sorted seed, which has a lower germination rate and offers no guarantee as regards varietal purity. Furthermore, cereal growers' marked preference for local long-stem varieties was not catered for by the cooperatives and the OAIC, which tried to apply the State strategy of endeavouring to replace precisely these local varieties by foreign – short-stem – varieties, which were said to have higher grain yields. It is for these two reasons that cereal growers withheld part of their output with a view to using it as seed, exchanges between farmers being fairly frequent in order to avoid any genetic drift.

Expressed in relation to the rural population, the rest, which is consumed by the producers themselves, probably amounts to less than 35 kg per capita per year. Expressed in relation to the cereal farm population alone, this volume would provide an average intake of less than 130 kg per capita per year, which is well below real needs (over 270 kg), i.e. less than 50% of the needs of the cereal grower and his family. It is intended more as a reserve which is kept with a view to offsetting cyclical shortages of derivatives from the cereals industry, which were more frequent in rural than in the urban areas until the early 1990s.

In the final analysis, the quantities of cereals which are not marketed and are intended for human consumption are relatively marginal, since it is more in the interests of farmers to sell the commodities they produce and to purchase semolina and flour on the market in view of the price differential. Since the producer prices proposed to cereal growers by the cereal cooperatives were prices that were fixed by decree and provided little incentive to stock commodities on the farm, an appropriate price system being employed as practised in many countries with abundant output, it was more in the interest of farmers to deliver the quantities of cereals which they reckoned exceeded their needs immediately after the harvest. The collection of the bulk of domestic production was very soon concentrated between 1 June and 31 August of each year, with the positive result that it was easier for the cooperatives to cope with import storage needs.

And the bulk of cereal products supplied to the population was very soon supplied by industry. There were three factors which facilitated this process: the ban on the free sale of grain on local souks, the abolition of private trading (from 1966 to 1994), and the gradual shutdown of most of the mills that could grind grain purchased by consumers or produced by the cereal growers themselves. Whereas the processing industry only supplied 32.9 kg of semolina and 33.1 kg of flour per capita per year in 1966, it supplied three times as much durum wheat semolina in 1991 (91.6 kg), partly on the basis of imports, and 74% more of flours (57.5 kg), i.e. a total of 149.1 kg of derivatives in 1991 compared to 66 kg in 1966. The volume of self-supplier consumption and the volume sold on the informal market has since

accounted for only a very modest share, which is steadily decreasing (less than 15% today), excluding barley.

The evolution of guaranteed producer prices has gone through several phases which indicate how slowly the authorities have come to realise that the cereals deficit is structural in nature. From 1963 to 1973, for example, the guaranteed prices remained virtually stable – the slight adjustment carried out in 1968 did not even compensate for inflation rate. This stability of the producer prices applied on the domestic market seems to have been dictated by the downward trend of prices on the world market. Yet, in relative terms, domestic prices eventually dropped to below the world prices – from 1968 until 1975 – thus penalising national production.

There was in fact a sharp rise in prices on the world market from 1973 onwards, partially as the result of the fourfold increase in hydrocarbon prices. The rise in the cost of imports and the steady increase in import volume induced the State to resort more and more frequently to prices as an essential, if not the sole, means of encouraging farmers to increase production.

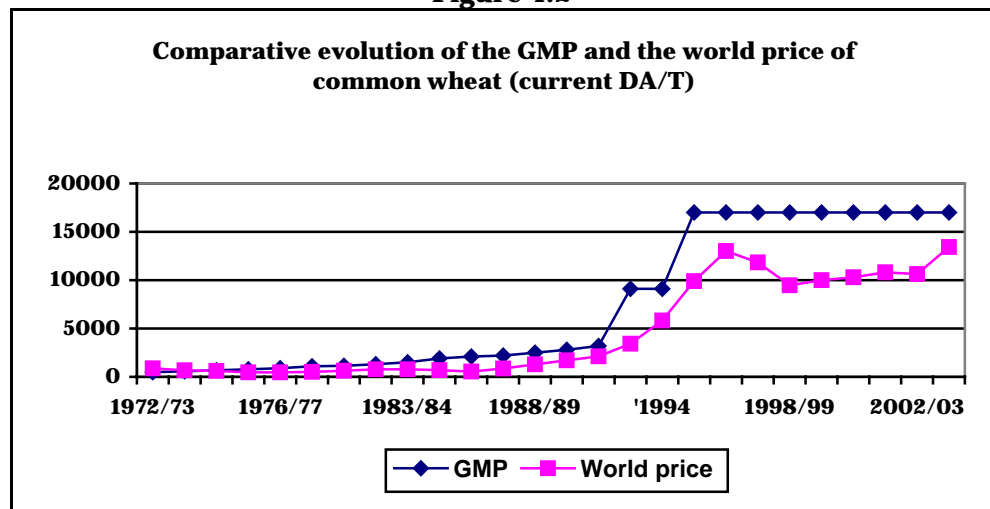
Upward adjustments were thus made, accelerating from 1983 onwards and bringing wheat prices to levels well above those practised on the world market. This policy was maintained even after 1985, despite the fact that world prices collapsed on a long-term basis as the result of the trade war in which several major exporters (US, EEC) were engaging and it became easier to import as the result of the modifications made in the financing terms applied by suppliers. Since the 1992-1993 cereal marketing year, there have been two marked increases in the guaranteed minimum producer price (GMP) for common and durum wheat. With the latter increase, which dates from 1995-1996, a price of 19 000 DA/tonne was fixed for durum wheat and of 17 000 DA/tonne for common wheat.

**Table 4.5 – Evolution of producer prices for the three major cereals from 1963 to 2005 (current DA/T)**

Year	Durum wheat	Common wheat	Barley
1963-1967	500	406,5	322
1968-1971	530	440	317
1973	540	480	317
1974	637,8	585	407
1975	757,8	685	497
1976	860	780	550
1977	1 000	900	600
1978	1 200	1 100	800
1979-1980	1 250	1 150	800
1981-1982	1 400	1 300	800
1983-1984	1 600	1 500	1 000
1985	2 000	1 900	1 400
1986-1987	2 200	2 100	1 550
1988	2 700	2 200	1 700
1989	3 200	2 500	1 900
1990	4 200	2 800	2 300
1991	4 600	3 200	2 300
1992-1993	10 250	9 100	4 700
1994	10 250	9 100	6 000
1995-1998	19 000	17 000	10 000
1999-2005	19 000	17 000	Free

Data source: Algerian Official Journal.

**Figure 4.2**



In view of the successive devaluations of the national currency since the application of the Structural Adjustment Programme, these GMPs were equivalent to US\$257.3 and US\$230.2 per tonne respectively in June 2005.

On the demand side, the mode of operation imposed on the cereals market was defined with reference to a food policy which aimed to keep cereals in the leading position in food intake since it was based on the practice of low and stable consumer prices for all cereal derivatives. From 1975 to 1994, the consumer price of flour and semolina constituted the reference price on the basis of which the prices at which the OAIC sold cereals to the milling plants and semolina factories were defined, whether those cereals were produced locally or imported. Since consumer prices were practically fixed at a very low level, the State had to finance the difference between the price at which cereals were sold to industry and the real prices paid by the OAIC to farmers and foreign suppliers. This mode of operation required heavy production subsidies from the State budget and, at the same time, even heavier consumer subsidies. The economic and social stability sought by the State proved more and more costly in budget terms and in terms of the balance of payments. For provision had to be made for an ever-growing volume of funds in order to pay the producer and consumer subsidies imposed by the system. Although the regulatory mechanisms that had been established allowed the State to regulate prices at all levels of the sector and thus instituted arbitration between cereal growers or industrialists producing in different price conditions and consumers with disparate incomes, that arbitration generally had a negative impact on the accumulation capacities of most producers (farms or industrial firms) providing only a moderate incentive for them to take risks and innovate.

However, the internal and external debt of the State reached an intolerable threshold by the mid-1980s and thus forced the public authorities to drastically revise their policies by applying a Structural Adjustment Programme and numerous economic reforms, all of which aimed to liberalise the market. In view of the eminently strategic nature of the cereals sector in both social and economic terms, the State adopted a cautious attitude in this liberalisation effort. It consisted, in short, of conserving the principle of support for local production by maintaining a GMP, but only for wheat, the prices of barley, maize and oats being determined henceforth solely by market forces. Furthermore, in order to relieve the State budget to some extent, the maintaining of regulated prices for wheat derivatives was backed with a change in the method for determining those prices. Since the production of cereal derivatives (flour and semolina) depended on imported cereals at a rate of up to 70%, the prices of those derivatives were established with reference to the price of wheat on the world market, and thus on the basis of the CIF price, from 20 June 1992 onwards.

In short, the consumer was asked to pay the real price for imported wheat because the consumer subsidy had to be done away with.

The regulated prices of semolina and bread were thus increased progressively in order to cushion the shock caused by the immediate application of this new mechanism. This "soft" approach involved maintaining consumer subsidies by means of the system for financing the difference between the reference price and the price at which grain was sold to milling plants and semolina factories, a system which had already been used previously. However, the progressive rise in the consumer price meant that the subsidy was degressive and thus dropped from 205.01 DA/quintal (DA/ql) of durum wheat in June 1992 to 72.53 DA/ql in June 1995 before being eliminated completely in April 1996. In the case of common wheat, the subsidy dropped from 338 DA/ql to 275.77 DA/ql by the same dates.

**Table 4.6 - Evolution of bread and semolina prices since 1989 (DA)**

	From 1989 to 19/06/92	20/06/92 to 23/03/94	24/03/94 to 15/12/94	15/12/94 to 02/04/95	03/04/95 to 08/07/95	09/07/95 to 02/04/96	Since April 1996
<b>Bread</b> (250 g)	1,00	1,50	2,50	4,00	5,00	6,00	7,50
<b>Semo- lina (kg)</b>	2,30	4,50	7,00	11,00	14,00	16,00	31,00

Source: Algerian Official Journal.

The application of the economic reforms within the framework of the Structural Adjustment Plan and of the rescheduling of the foreign debt led to the progressive dismantling of the price formation system and the organisation of the production, processing and distribution of cereals and their derivatives.

#### **4.4 - The restructuring of imports according to origin**

Whereas domestic supply was only growing at a virtually negligible rate, the deficit in domestic supply compared to demand grew at an alarming rate. The table below compares the evolution of local wheat supplies (total output minus the quantities used as seed) with that of wheat imports for human consumption. In view of the fact that barley has been tending to be eliminated from the human diet, a trend which was clearly proved by the consumption surveys conducted in 1966-1967, 1979-1980 and 1988, we have considered that only an evaluation of wheat supplies would be of interest. It is observed that the cereals intake available to each inhabitant on the basis of local production alone dropped from 86.4 kg in the 1967-1972 period to 42.5 kg in 1992-1997, the lowest level of the period, before rising again to 53.4 kg in the last six years. If one considers that the minimum cereals intake is probably 185 kg/capita/year, the share of domestic production would thus have dropped from 46.7% of needs to 23% in the period from 1992 to 1997 and would then have risen to 28.9% at the end of the period. The deficit compared to

demand would thus be over 71% on average at the present time. Although these are only rough estimates, they are nevertheless sufficiently explicit to indicate the general trends.

**Table 4.7 - Evolution of total and per capita wheat supply according to origin**

Period	Total supply		Per capita supply			Population
	Local wheat	Imported wheat	Local wheat	Imported wheat	Total	
Units	1000 T	1000 T	kg	kg	kg	1000
1962-67	1174.1	0.0	98.5			11 923
1967-72	1181.5	678.2	86.4	49.5	135.7	13 700
1972-77	1047.4	1513.5	67.4	97.4	164.9	15 533
1977-82	950.1	2675.4	50.7	142.8	193.5	18 740
1982-87	928.0	3325.2	43.7	156.4	200.1	21 260
1987-92	1070.3	4238.2	42.9	169.8	212.7	24 960
1992-97	1208.5	4528.9	42.5	159.2	201.7	28 450
1997-03	1634.9	4732.5	53.4	154.5	207.9	30 625

The deficit that was registered was thus systematically made up by imports, which became increasingly massive and increasingly costly. The achievement of the objective of the low uniform price throughout the country soon forced the State to provide growing volumes of subsidies in order to cover the differences between the import price and the consumer price as well as the distribution costs.

In addition, the achievement of the same objective had a somewhat perverse effect on consumption patterns, since it reinforced the preference for noble cereals (durum and common wheat) as opposed to secondary cereals (mainly barley), which were virtually eliminated from the human diet, and, in the noble cereals category, it also reinforced the predominance of durum wheat over common wheat, even though durum wheat was more rare and more expensive on the world market.

Furthermore, State food policy also aimed to increase the share of animal products (meat, milk, eggs) in consumption patterns. This led to the establishment of an animal feed industry (manufacturing poultry feed in particular), which concerned large volumes of secondary cereals (maize), and to guaranteed supplies of barley for rapidly growing numbers of sheep.

**Table 4.8 - Evolution of cereals imports (1000 T)**

<b>Year</b>	<b>Wheat</b>	<b>Barley</b>	<b>Oats</b>	<b>Maize</b>	<b>Total</b>
1966	775	40	9.7	2	827
1967	718	40	4.9	11	774
1968	704	30	0.0	4	738
1969	447	0	0.0	8	455
1970	343	0	0.0	12	355
1971	728	21	0.0	11	759
1972	1 169	71	0.0	37	1 277
1973	798	12	0.0	34	844
1974	1 706	87	0.0	17	1 810
1975	1 577	49	6.4	28	1 661
1976	1 684	67	3.7	95	1 849
1977	1 803	131	0.5	161	2 096
1978	2 410	520	5.1	187	3 122
1979	2 419	342	34.4	168	2 964
1980	3 001	269	8.5	107	3 385
1981	2 318	104	4.6	276	2 702
1982	3 229	465	9.6	373	4 077
1983	3 053	373	11.2	305	3 742
1984	2 940	614	17.3	519	4 091
1985	4 038	535	8.3	664	5 245
1986	3 654	0	0.0	918	4 573
1987	2 941	54	0.0	847	3 841
1988	3 857	572	0.0	913	5 342
1989	6 056	557	78.0	1 448	8 139
1990	3 604	283	134.1	988	5 009
1991	3 637	45	12.3	831	4 525
1992	4 037	110	3.7	991	5 141
1993	4 244	500	5.7	1 155	5 904
1994	5 263	667	25.5	1 378	7 333
1995	5 069	155	0.0	895	6 119
1996	3 200	0	0.0	731	3 931
1997	4 869	220	0.1	845	5 934
1998	3 959	560	0.0	952	5 471
1999	4 383	659	3.9	1 100	6 146
2000	5 373	570	8.9	1 482	7 434
2001	4 561	340	10.2	1 679	6 788
2002	6 028	593	9.1	1 878	8 508
2003	4 091	30	4.8	1 371	5 497
2004	3 882	49	0.0	1 822	5 753

Source : FAOSTAT and Algerian customs authorities.

It was from 1973 onwards – after the considerable increase in foreign exchange revenue obtained through the hydrocarbon market following the "first oil crisis" and despite the equally considerable increase in cereals prices on the world market

– that Algerian cereals imports became structural and increasingly massive. The volume of these imports more than tripled between the 5-year period from 1972 to 1977 and the 1982-1987 period, rising from an index of 100 to an index of 340. Ten years later their volume had increased more than fivefold (with an index of 526 in the 1997-2003 period) and amounted to a total volume of almost 6.9 million tonnes, i.e. more than twice the volume of domestic output. The average annual cost rose from US\$257 million in the 1972-1977 period to over US\$1 billion in 1992-1997 before dropping again to US\$856 million in the course of the last six years.

In the case of maize, since local production was hardly worth mentioning and direct human consumption was virtually inexistent, needs were satisfied exclusively by imports, which were intended directly for the animal feed manufacturing plants. Volumes increased from 1976 onwards at the growth rate in the production capacities of the poultry sector as a whole. Whereas less than 100 000 tonnes were purchased on the international market before 1976, the year when the first major poultry farms were launched, the quantities multiplied tenfold from 1987-1992 onwards; they then stagnated at an annual average of 1 million tonnes for over a decade before returning to a marked upward trend in the last five years, during which over 1.2 million tonnes were imported per year.

Barley imports, on the other hand, are intended to satisfy mainly the needs of sheep farmers, and import volumes vary widely from one year to the next since they follow fluctuations in local production. Before 1986 the volume of imports was often at zero level and always below 100 000 tonnes; they then became constant and increased rapidly in view of the growth in sheep numbers and the succession of years with low rainfall. They have amounted to almost 500 000 tonnes per year over the last six years.



**Table 4.9 - Evolution of cereals imports  
(million US\$)**

Year	Wheat	Barley	Oats	Maize	Total
1966	60	3	1.0	0	64
1967	55	3	0.3	1	59
1968	50	2	0.0	0	52
1969	39	0	0.0	0	40
1970	27	0	0.0	1	27
1971	54	1	0.0	1	56
1972	68	4	0.0	2	74
1973	90	2	0.0	4	96
1974	305	14	0.0	2	321
1975	385	9	0.8	5	400
1976	368	10	0.4	13	393
1977	305	19	0.3	21	347
1978	403	73	1.5	24	501
1979	465	50	20.3	28	563
1980	690	52	6.2	19	767
1981	632	18	2.7	59	712
1982	698	84	6.4	63	852
1983	555	50	7.0	50	662
1984	528	91	11.2	90	720
1985	752	74	4.6	106	936
1986	548	0	0.0	115	664
1987	433	4	0.0	87	524
1988	493	62	0.0	107	661
1989	981	76	25.6	222	1 305
1990	623	52	19.9	123	818
1991	455	9	6.7	115	585
1992	593	17	2.8	137	749
1993	656	70	2.8	142	872
1994	988	120	26.4	196	1 331
1995	1 069	17	0.0	134	1 220
1996	911	0	0.0	145	1 057
1997	1 050	33	0.0	144	1 227
1998	802	56	0.0	132	990
1999	671	68	0.6	150	890
2000	806	69	2.1	175	1 052
2001	728	42	2.2	205	977
2002	952	64	2.0	237	1 256
2003	675	3	1.2	160	839
2004	830	6	0.0	303	1 140

Source : FAOSTAT and Algerian customs authorities.

Wheat imports are intended for state-owned industrial processing enterprises, whose grinding capacities have quadrupled in just over 30 years (43 700 ql/day in

1965 and 180 670 ql/day in 1998). These capacities have doubled since 1998 following the liberalisation of the sector and the increase in the number of private mills. The direct sale of cereals to consumers is virtually excluded, and seed quantities account for only a very small proportion of total imports. Despite the very rapid and sharp growth in wheat imports and the subsequent increase in the volumes of semolina and flour produced by the national cereals industry, the regular supply of a sufficient quantity of commodities on the domestic market requires the import of a complement in the form of semi-finished products; the following table shows the volumes involved.

**Table 4.10 - Evolution of semolina and flour imports in grain equivalents (1000 T)**

Period	Semolina	Grain equivalent	Flour	Grain equivalent	Total grain equivalent	Index
<b>1972-77</b>	74.2	103.0	117.1	156.1	259.1	100
<b>1977-82</b>	460.4	639.5	202.9	270.6	910.1	351
<b>1982-87</b>	667.2	926.7	71.5	95.4	1 022.1	394
<b>1987-92</b>	766.9	1 065.1	95.5	127.3	1 192.5	460
<b>1992-97</b>	557.6	774.4	583.2	777.4	1 551.8	599
<b>1997-03</b>	14.8	20.5	258.7	344.8	365.3	141

Data sources: ENIAL<sup>3</sup>/DEP<sup>4</sup> balance sheet for 1995; balance sheets of the Agrobase Holding and ERIAD Group.

Imports ultimately played a key role in supplying the national cereals market. In view of the very limited progress registered in domestic cereals production, the State was doomed to constantly seek means of achieving a form of rational management of external supplies that suited the budget resources of the moment but offered a guarantee against the risks of shortages, which always had dire effects. The growing inadequacy of domestic supply forced the OAIC, which held the monopoly of the cereals trade from 1962 to 1996, to focus its activities primarily on controlling the flow from the world market. Annual imports were planned on the basis of the forecast of needs for each species and harvest forecasts as well as the stocks held by the cooperative network. This planning was never very easy because, first of all, there were no reliable consumption indicators. And it was made even more random by the inaccurate data on domestic production supplied by the Ministry of Agriculture.

The need to reconcile the world and domestic prices, to adjust imported volumes to the level of the national deficit, to ensure a regular supply for the processing industry, to build up reserves, and so on, were imperatives which induced the State to vest itself with means and regulatory mechanisms that were suited to its

<sup>3</sup> ENIAL : national food industry enterprise.

<sup>4</sup> DEP: Directorate for Surveys and Planning.

objectives in the field of food policy and economic policy in the broad sense of the term.

Obviously, in view of the oligopolistic nature of the cereals market, the OAIC's leeway was very limited as regards choice of suppliers or negotiating sales conditions – a situation common to all major importers. Import planning was already complex and was further complicated by the constraints imposed on the OAIC concerning the transport and handling of the cereals purchased on the world market. First of all, the State imposed observance of a preferential clause for the national armament, i.e. for the ships belonging to the National Maritime Company (CNAN) whenever they were available and even if it was more costly in relative terms to charter those vessels. It further required the OAIC to use the means and facilities of harbour enterprises for unloading the ships even though it had more efficient teams, whose services it was only allowed to use in addition to those of the harbour enterprises. Furthermore, the deficiencies of the country's port capacities (only one deep-water harbour - Oran - to which Djendjen harbour had recently been added, although the latter harbour was still underutilised in view of the difficulty in evacuating the quantities unloaded because of the lack of adequate road or rail infrastructures) limited the size of the vessels chartered (10 000 to 25 000 tonnes) and increased transport costs accordingly. The use of small boats required very rigorous negotiation of the contracts signed with the big shippers in order to avoid a situation where boats loaded with cargo had to wait in harbour, since these waiting periods entailed the payment of demurrage. These constraints combined to make it virtually impossible to achieve any appreciable reduction in the costs incurred in the reception of the veritable fleet of boats required to supply the country (there were up to 600 on average each year, i.e. two a day).

In addition, the management of these flows was made all the more difficult, since the problems posed by the above-mentioned specificities of the international cereals market were compounded by those posed by the complexity of the price formation mechanisms on the domestic market, whose operation ultimately depended on the behaviour of the OAIC.

The mechanism which had been adopted hitherto had an appreciable advantage: it meant that the domestic price system could be artificially disconnected from world prices. Local production did not actually compete directly with imported products, since the OAIC provided the guarantee that all of the commodities delivered by crop growers would be purchased at the guaranteed price through the cereals cooperatives.

However, it nevertheless cannot be said that the world market was absolutely neutral with regard to local production, since the certainty that regular supplies would be provided on the domestic market was bound to influence the behaviour of Algerian cereal growers, for whom this would be a further reason for confirming choices henceforth dictated solely by their aversion to risk, since self-sufficiency in cereals was considered less and less an absolute necessity.

It was thus not until 1994, when the constraints imposed had become sufficiently burdensome, that any major change was made to the price formation system in the cereals sector. This change was brought about essentially through the adoption of a new reference: the level of the import price, which was taken as a basis for determining the consumer price, the milling, bread-making and distribution margins of the various actors thereby being taken into account. So the consumer prices of bread, flour and semolina depended henceforth on the evolution of prices on the world market. The only subsidies that remained were thus those involved in the difference between the guaranteed prices paid to local cereal growers and the prices at which the commodities were sold to the processing industries. And wheat (both durum and common) was the only commodity still subsidised after the liberalisation of the marketing of the other cereals (barley, oats, maize). Local wheat production thus continued to benefit from protection against competition from imported products. It must be pointed out, however, that that protection was far from any level that would have compromised the chances of integration into the framework of the new world organisation of trade. A recent survey conducted by N. Lamdani and based on the construction of a policy analysis matrix (PAM) actually shows that national cereal production was not really protected at all, since the total Aggregate Support Measure (total ASM) was less than 3% for the years from 1994 to 1997.

After Algeria's ratification of the Agreement Establishing the World Trade Organisation and then of the Grains Trade Convention, a process for liberalising the import of cereals was launched seriously from 1996 onwards within the framework of the economic reforms the country had been embarking upon since 1987-1988. It created the opportunity for any economic agent (public or private), whether specialising in import/export operations or not (industrial firms which process cereals, for example), to import cereals on the basis of licences issued by the OAIC in accordance with specifications stipulating inter alia the quality standards and ceiling prices tolerated. The increase in the number of industrial milling plants in the private sector attracted many private import-export firms and scores of them embarked on activities in the import of cereals to such an extent that their contributions today account for 50% of the total volume of imports. But due to the vagaries of the world cereals market, particularly over the last two years, the weakest firms have withdrawn from this activity and it is conceivable that in the very short term there will be only five or six left including the Blanky Group, which has its own storage facilities and is also launching activities in the processing sector.

However, since the new operators have no obligation to guarantee that they will supply the national market, that function remains the privilege of the OAIC, which, not surprisingly, is finding it much more difficult to provide that guarantee than was the case in the past. The volatility of prices on the world market from one month to the next or from one season to another can cause the new actors to withdraw provisionally, and this forces the OAIC to take over just when prices are at their highest. The public agency thus now finds itself vested with the "moral"

responsibility of supplying the domestic market without having the prerogatives that it formerly enjoyed for fulfilling that regulatory mission. This to a large extent explains the delays that have accumulated in the measures to adapt the OAIC to the new status of Commercial Public Undertaking, which it acquired in 1997.

The Algerian market thus attracts the attention of many supplier countries with permanent or occasional cereals surpluses.

In the course of the last 10 years from 1995 to 2004, for instance, 36 countries delivered **durum wheat** to the Algerian market, and the average annual import volume amounted to a total of 2 996 716 tonnes with an average value of US\$564.1 million. Six of these suppliers are conspicuous by the regularity and volume of their contributions; in order of importance, they are Canada (38.2%), France (13.8%), Germany (11.7%), the US (10.5%), Mexico (7.2%) and Syria (6.2%). Together they deliver 87.5% of the volume imported by Algeria each year. However, whereas Canada, the US, France and Syria can be regarded as traditional suppliers, Germany and Mexico are "outsiders" which have seriously challenged the positions acquired by the first three countries. With 31.4% of market shares, the seven countries of the EU which contribute to supplying the Algerian market come only second after Canada.

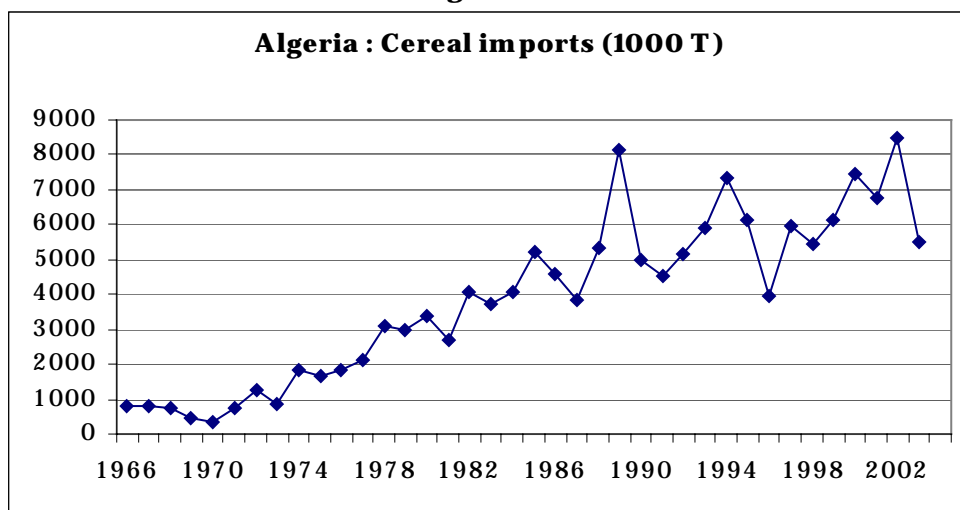
**Common wheat** is the second cereal which Algeria imports regularly in massive quantities. There are now 35 countries which participate in supplying the Algerian market whereas there were less than 10 until 1998. That market has been absorbing 1 114 056 tonnes of common wheat per year amounting to an average value of US\$168.2 million. But it must be noted that the imported tonnage, and the cost, has been rising sharply since 2000. The two traditional suppliers – France and the US – account for 42.2% of imports, but France has taken the lead again (36%) after losing that position in the period preceding the Blair House Agreement (1984-1993) as the result of the aggressive commercial policy pursued by the US to win market shares, particularly in North Africa. The steady increase in imports from Germany must also be noted (that country now holds 15.9% of the market), as must the arrival in force of Russian wheat (13.3%). There are in fact five countries (France, Germany, the Russian Federation, Canada and the US) which provide 79.1% of supplies, the remaining 20.9% being supplied by the other 30 countries.

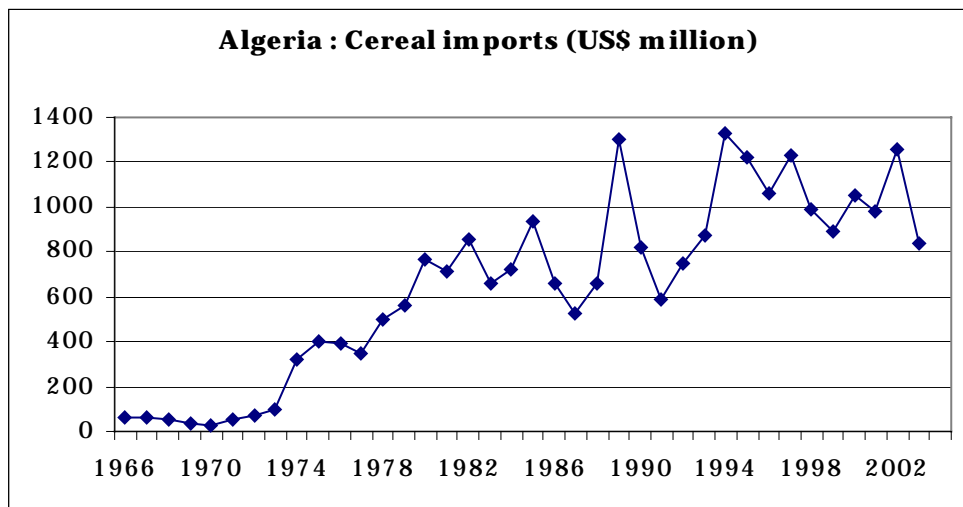
In the same 10-year period, no less than 34 countries supplied Algeria with **maize**. The market has absorbed an average annual of volume of 1 235 084 tonnes, but there has been a marked upward trend since 2000, since the poultry sector seems to be overcoming the crisis it went through following the implementation of the structural adjustment programme. In the last five years the average annual volume of maize imports has in fact amounted to 1 675 472 tonnes, which has been an increase of 110% compared to the previous 5-year period (794 696 tonnes). Only 4 of the 34 suppliers (the US, Argentina, France and Hungary) can be considered traditional suppliers. But the bulk of market shares is undoubtedly held by the US (74.65% of volume on average) followed by Argentina, which lags far behind with

14.62%. Although France is always present in the list of suppliers, it only controls a very small market share – 1% – and is preceded by Hungary with 4.18%. The very modest remainder (5.5%) is shared by the other 30 supplier countries, which do not sell regularly on the Algerian market. In the period under review the average annual value of imports amounted to 182.5 US\$ million, the average price per tonne being US\$147.7.

As for **barley** imports, which have been a permanent feature since 1987, the average annual volume purchased on the international market amounted to 330 683 tonnes over the same period from 1995 to 2004, with an average value of US\$37.2 million, i.e. an average price of US\$112.35/tonne. These purchases were made from 22 different supplier countries, only five of which were able to control market shares of over 5%: France (28.5%), the Russian Federation (21.24%), the United Kingdom (12.1%), Spain (4.9%) and Germany (4.9%). These five countries together provide over 71,6% of the barley supplied to the Algerian market. The other 17 supplier countries share the remaining 28.4%, which is distributed very unevenly, however, since six countries – Ukraine (5.07%), Romania (4.28%), Syria (4.34%), Bulgaria (3.54%), Turkey (3.09%) and the US (3.01%) – capture 23.33% of the shares, actually leaving only 5.1% of the Algerian market to the other 12 countries.

**Figure 4.3**



**Figure 4.4**

In the final analysis, Algerian cereal imports amounted to an annual average of 5 677 539 tonnes over the last decade and to a total cost of US\$952 million. Wheat for human consumption alone accounted for 72.4% of the total volume (4 110 772 tonnes) and 76.9% of the total cost (US\$732.3 million).

The three scenarios that were constructed to evaluate future domestic supply and demand included an estimate of the evolution of imports over the next 10 years. In scenario no.1, the "optimistic" scenario, wheat imports would stabilise at 4.625 million tonnes at a total cost of 740.1 US\$ million, an increase of 19.7% compared to the hypotheses concerning the evolution of prices on the international market. In scenario no.3, the "pessimistic" scenario, wheat imports would increase by 14.5% amounting to a volume of 5.294 million tonnes, whereas they would cost something like 859.4 US\$ million, an increase of 38.9% compared to 2003. The midway scenario forecasts the import of 4 976 million tonnes, i.e. a moderate increase of 7.6%, at a total cost of 802 US\$ million, which would be an increase of 29.7% compared to 2003. In all three cases the degree of dependence on the international market would remain very high, ranging from 68.6% in scenario no. 1 to 73.8% in scenario no. 3.

**Table 4.11 Projections of wheat output, demand and imports from 2003 to 2015**  
**Scenarios A, B and C**

	<b>Units</b>	<b>2003</b>	<b>2015 A</b>	<b>2015 B</b>	<b>2015 C</b>
Population	million	32.08	38.58	39.04	39.51
Durum wheat output	1000 T	1 080.89	1 370.83	1 292.33	1 217.97
Common wheat output	1000 T	589.90	748.14	705.29	664.71
Total wheat output	1000 T	1 670.79	2 118.96	1 997.62	1 882.68
Durum wheat/capita	kg	95.00	79.24	84.21	89.45
Durum wheat demand	1000 T	3 047.60	3 057.40	3 287.52	3 533.85
Common wheat/capita	kg	90.00	95.55	94.42	92.18
Common wheat demand	1000 T	2 887.20	3 686.62	3 686.13	3 641.69
Total wheat demand	1000 T	5 934.80	6 744.02	6 973.65	7 175.54
Durum wheat imports	1000 T	1 966.71	1 686.57	1 995.20	2 315.88
Common wheat imports	1000 T	2 297.30	2 938.49	2 980.83	2 976.97
Total wheat imports	1000 T	4 264.02	4 625.06	4 976.03	5 292.85
Durum wheat imports	million \$	332.88	435.75	360.05	417.91
Common wheat imports	million \$	285.61	304.35	442.03	441.46
Total wheat imports	million \$	618.49	740.10	802.07	859.37
Imports/demand	%	71.85	68.58	71.35	73.76

#### **4.5 - The consequences for Algeria of the future WTO negotiations on access to the market and production and export support in exporting countries (US, EU, others)**

Algeria is currently deeply involved in measures aiming to integrate the national economy into the globalisation process to a greater extent in the short term. In September 2005 the country began to implement the Association Agreement which was signed with the European Union and is based essentially on the progressive dismantling of customs barriers with a view to completing the construction of the EU/Mediterranean free trade zone. In addition to this, Algeria is currently putting the finishing touches to an agreement on WTO membership, which is due to be finalised by the end of 2005 or beginning of 2006. What will be the main effects of the application of these two agreements on the Algerian cereals sector?

It has been mentioned above that the national market is already open to a large extent to trade in all cereals with the outside world, since imports cover over 70% of needs on average and the growth in domestic output is unlikely to lead to any appreciable reduction in that share in the medium-term. On the contrary, the projections which we have constructed show that, at best, the volume of imports will be stabilised at the present level and that it is highly likely that volume will grow significantly. The application of the two agreements with the EU and the WTO should result in a reduction of the customs duties levied on imported grain. These duties are currently very low (5%), and reducing them would be in the



interests of both industry (whose costs would decrease accordingly) and consumers (who should benefit from this decrease in processing costs). The State would be the only loser, since its customs revenue would drop, but since that revenue only accounts for a very small share of budget resources, this would hardly constitute an insurmountable handicap. Cereals from the EU already benefit from a preferential rate of 0% on the quotas defined by the agreement (100 000 tonnes in the case of durum wheat, 300 000 tonnes in the case of common wheat, 200 000 tonnes in the case of barley and 500 tonnes in the case of maize); these quantities are still below the selling capacity on the Algerian market, which means that the bulk of European cereals will have to be subject to the tariff negotiated with the WTO.

On the other hand, the application of these two agreements could have adverse effects on all of the firms in the sector that specialise in further processing (bakeries, pasta and couscous factories, biscuit factories), most of which would be uncompetitive if customs duties were considerably reduced. Since 1998, it has only been possible to reduce the volume of cereal derivative imports by maintaining a high customs tariff (30%), increased in 2000 by a Provisional Additional Duty, which was originally fixed at 36% and was to be gradually reduced to zero by January 2006.

However, in the case of cereal derivatives from the EU the agreement concluded makes provision for a 25% reduction of customs tariffs compared to the current tariff for a very limited number of tariff lines (4) concerning sensitive products.

What will be the predictable impact on Algerian cereal growers? The abolition of all forms of aid to farmers and the direct immediate confrontation of local production with imported products without any prior measures to upgrade local cereal farms would force national farmers to give up farming because they could not compete. But the fact that Algeria is situated in an agro-climatic zone where a semi-arid climate is the predominant feature leaves few production alternatives to farmers, most of whom would be doomed to retire from farming if they could no longer grow cereals.

The mechanism currently in operation is based on the fixing of a guaranteed minimum producer price (GMP) for both common wheat (GMP = 1 700 DA/ql) and durum wheat (GMP = 1 900 DA/ql), which is paid to farmers irrespective of the quantities they deliver to the collecting organisations. The GMP is supposed to correspond to the price normally charged by farmers in order to ensure that their activity is profitable. In the absence of any GMP their output would have been directly confronted with imported wheat, the international price would have been imposed as the reference price for local production, and they would without a doubt have stopped farming. So this mechanism provides support for all producers. It is close to the "deficiency payments" mechanism practised in particular by the United States. The greater the volume of domestic output, the greater the costs that will be generated for the State budget through the payment of the price differential (GMP – international price) to producers. This producer support is an indirect form

of protection of national production to the detriment of imports. The member countries of the WTO would certainly consider it unacceptable if the volume of imports did not already amount to a very large share of consumption, which means that there is no difficulty for foreign wheat to access the Algerian market. It does not in principle have any perverse effect on consumption, since it is the average price on the international market which constitutes the reference for forming the prices at which grain is sold to millers and for forming the consumer prices of wheat derivatives. The differential received by Algerian cereal growers does not influence the behaviour of the other operators in the sector, who can only regard the price they pay for the grain they use as a factor which guides their preferences for local grain or imported grain. Whatever the origin of that grain, the price they will pay for it will be determined solely by its intrinsic qualities. The same applies to consumers, who are at the end of the chain. Furthermore, farmers only receive the subsidy for the quantities that are delivered to the collecting organisations. But, as has already been stated, the quantity collected is, at best, equivalent to 50% of the harvest.

With regard to market access, the public authorities have already carried out fundamental reforms of the protection system, since the system currently in operation is one which allows fluctuations in the international price to affect domestic prices. At the present time, these domestic prices are equivalent to the CIF price increased only by port charges and a customs duty calculated in proportion to the CIF value.

With a system of this nature operators (millers, importers) are obviously absolutely free to decide on the quantities to be imported in order to supply the domestic market and the sources of their supplies.

In the final analysis, the main problem created by the application of the Uruguay Round Agreements lies in the difficulties it is bound to create for the stabilisation of the consumer prices of strategic products such as bread and semolina. All of the projections that have been elaborated on the future evolution of cereal prices on the international market rely on an upward trend connected with the reduction of the internal supports granted to cereal growers in the major exporting countries and to a moderate increase in world production. In Algeria, the efforts to maintain the current mechanism for determining consumer prices will have to be adapted through the introduction of a system for constantly updating the reference price (the average price on the international market), and it will thus have to be accepted that an increase in that international price will affect the consumer price, which would in fact become a market price. Will the consequences in terms of consumer purchasing power be politically acceptable?

## **5    *Cereals in Spain*<sup>1</sup>**

Cereals account for 10-11% of the final agrarian production and just under 20% of the final crop production. Dry land crops, which occupy most of the area, show low and uneven yields due to climate conditions, and at the same time inefficient farm structures make it difficult to achieve economies of scale. However, these crops have a very high environmental value, especially in steppe bird habitats. Cereal farming in dry lands is practised in expansive disadvantaged areas, where it accounts for a large share of total agrarian production. In some of those disadvantaged areas of environmental value, the future feasibility of crop husbandry is called in question in the context of the new regulations and in the current structural conditions.

The present chapter discusses the main trends in the cereals sector during the last few years: production, consumption and foreign trade, the production structure of the agrarian sector, and the situation in the main sectors where there is a demand for cereals are analysed, and a brief explanation of trade conditions is also included.

### **5.1 - Balance of cereals in Spain**

The overall balance of cereals over the farm years since Spain joined the EEC allows us to give the main parameters for the sector:

- a structural deficit, which has increased throughout this period;
- apparent consumption greater than output and growing, with less marked fluctuations than those registered in output;
- stagnant production subject to wide fluctuations due to agro-climatic effects in dry farming, while the area dropped by 1 200 000 hectares;
- steady growth in imports, much greater than the growth in exports;

---

<sup>1</sup> Alicia Langreo, Doctor of Agricultural Engineering. General Director of the Saborá Studies Company and Isabel Benito, Technical Agricultural Engineer. Director of the Saborá Studies Company (Spain).

**Table 5.1 – Cereals balance (tonnes)**

<b>Farm year</b>	<b>Production</b>	<b>Imports</b>	<b>Exports</b>	<b>Variations in stocks</b>	<b>Apparent consumption</b>
<b>1985-86</b>	20 509	3 525	2 189	-534	22 380
<b>1986-87</b>	15 999	2 793	662	-1 135	19 265
<b>1987-88</b>	20 209	2 865	2 618	79	20 376
<b>1988-89</b>	23 146	2 479	2 481	2 653	20 492
<b>1989-90</b>	19 346	2 326	2 203	-732	20 244
<b>1990-91</b>	18 171	3 179	1 462	-21	19 910
<b>1991-92</b>	18 770	3 573	2 003	1 307	19 139
<b>1992-93</b>	13 935	2 990	1 311	-2 346	17 959
<b>1993-94</b>	17 143	5 370	1 795	1 395	19 324
<b>1994-95</b>	14 882	5 187	2 948	-1 696	18 757
<b>1995-96</b>	11 226	8 617	1 335	-168	18 677
<b>1996-97</b>	21 633	5 328	2 708	2 187	22 065
<b>1997-98</b>	18 533	7 465	1 919	-485	24 564
<b>1998-99</b>	21 768	7 582	2 257	724	26 370
<b>1999-00</b>	17 312	7 702	1 995	-1 849	24 867
<b>2000-01</b>	23 794	7 138	2 444	1 665	26 823
<b>2001-02</b>	16 943	8 830	2 255	-1 523	25 042

Source: Ministry of Agriculture, Fisheries and Food (MAPA).

The growth in deficit since EEC accession is due to the increase in fodder consumption resulting from the development of intensive livestock production for meat.

The use of wheat in cattle feed, which has increased since the BSE crisis, and growth in durum wheat production have promoted the consolidation of imports.

The area dedicated to wheat farming has virtually remained unchanged or has grown only slightly since Spain joined the EEC (8% in the period from 1985 to 2003), while production has increased by 18%, although with considerable fluctuations. Yields show an upward trend despite marked fluctuations due to the effect of drought on dry farming.

There has been high growth in foreign trade, especially in imports, which increased to over 6 million tonnes; the volume of exports has increased fourfold. Most exports were of durum wheat.

**Table 5.2 - Wheat: historical series of area, yield, output, value and foreign trade**

Year	Area (1000 ha)	Yield (ql/ha)	Output 1000 t)	Average price received by farmers (€/100 kg)	Value (1) (€ 1000)	Foreign trade (2) (tonnes)	
						Imports	Exports
<b>1985</b>	2 043.3	26.1	5 328.7	15.64	722 705	232 197	198 251
<b>1986</b>	2 112.3	20.8	4 395.3	17.19	773 154	883 735	242 612
<b>1987</b>	2 221.3	26.1	5 790.9	16.81	976 446	731 384	742 240
<b>1988</b>	2 338.8	27.8	6 532.6	16.36	1 051 561	710 068	332 585
<b>1989</b>	2 317.3	23.6	5 468.2	15.70	858 422	180 272	341 002
<b>1990</b>	2 006.6	23.8	4 773.6	15.46	737 905	716 432	551 459
<b>1991</b>	2 223.3	24.6	5 467.7	16.64	909 607	1 886 338	586 682
<b>1992</b>	2 243.2	19.4	4 357.5	16.12	702 392	1 392 930	846 104
<b>1993</b>	2 030.5	24.5	4 973.0	16.20	805 789	1 977 580	1 106 780
<b>1994</b>	1 969.7	21.8	4 302.3	15.76	677 980	2 246 600	1 183 245
<b>1995</b>	2 126.5	14.8	3 138.7	16.98	533 096	3 146 126	864 192
<b>1996</b>	2 012.4	30.0	6 040.5	15.49	935 558	2 136 521	521 998
<b>1997</b>	2 078.7	22.5	4 676.6	15.43	721 786	3 172 031	392 826
<b>1998</b>	1 912.6	28.4	5 436.3	14.28	776 306	3 468 242	724 529
<b>1999</b>	2 455.4	21.5	5 281.3	13.79	728 144	3 538 540	600 224
<b>2000</b>	2 353.0	31.0	7 293.6	12.93	942 900	2 759 114	844 603
<b>2001</b>	2 177.0	23.0	5 007.7	14.88	745 145	4 207 822	1 299 652
<b>2002</b>	2 406.6	28.3	6 822.2	13.41	914 852	6 537 578	1 517 180
<b>2003 (P)</b>	2 218.0	28.4	6 290.1	13.80	868 034		

(1) The value of breeders' seed is not included.

(2) Flour included in grain equivalent; conversion rate from wheat into flour 0.75%, and semolina rate 0.72%.

(P) Provisional.

Source: MAPA.

The barley acreage dropped sharply – by 27% between 1985 and 2003, whereas the decrease in output was less marked (18%). Wide fluctuations were registered in both output and yields.

**Table 5.3 - Barley: historical series of area, yield, output, value and foreign trade**

Year	Area (1000 ha)	Yield (ql/ha)	Output (1000 t)	Average price received by farmers (€/100 kg)	Value (1) (€ 1000)	Foreign trade (2) (tonnes)	
						Imports	Exports
<b>1985</b>	4 245.6	25.2	10 698.3	13.2	1 401 218	1 971	953 407
<b>1986</b>	4 339.5	17.1	7 486.0	14.6	1 092 862	733 043	985 984
<b>1987</b>	4 396.6	22.3	9 894.3	13.6	1 339 428	97 335	286 559
<b>1988</b>	4 250.3	28.4	12 092.4	13.6	1 594 497	143 483	1 384 451
<b>1989</b>	4 305.2	21.8	9 428.7	13.6	1 286 355	8 895	1 660 546
<b>1990</b>	4 351.8	21.5	9 382.2	13.5	1 267 042	32 124	944 739
<b>1991</b>	4 412.8	21.0	9 270.1	13.6	1 265 275	106 349	613 650
<b>1992</b>	4 112.2	14.8	6 105.0	13.4	819 328	196 655	779 773
<b>1993</b>	3 540.9	27.4	9 700.8	13.3	1 286 164	74 921	383 062
<b>1994</b>	3 539.5	21.0	7 415.5	13.2	982 280	34 088	1 408 210
<b>1995</b>	3 555.9	14.2	5 046.6	14.9	751 594	1 242 185	269 203
<b>1996</b>	3 572.2	29.9	10 697.0	13.1	1 400 242	658 122	228 943
<b>1997</b>	3 682.3	23.2	8 549.8	13.3	1 140 241	412 044	270 489
<b>1998</b>	3 535.2	30.8	10 895.3	11.8	1 288 032	226 667	201 145
<b>1999</b>	3 120.0	23.9	7 459.5	12.1	901 663	218 707	618 032
<b>2000</b>	3 278.0	33.7	11 063.0	11.6	1 279 267	85 118	218 337
<b>2001</b>	2 992.1	20.9	6 249.1	12.7	790 516	823 382	217 888
<b>2002</b>	3 101.5	27.0	8 362.3	11.8	988 427	1 575 573	39 503
<b>2003 (P)</b>	3 089.0	28.2	8 698.4	12.2	1 056 856		

(1) The value of breeders' seed is not included.

(P) Provisional.

Source: MAPA.

Foreign trade is changing a great deal, but in the last few years the volume of barley exports decreased appreciably compared to the figures for 1985, while imports grew, although well below the growth in wheat and maize imports.

The maize acreage decreased less than 10% between 1985 and 2003, but yields grew considerably – by 40%, so production rose by almost 30%.

**Table 5.4 – Maize: historical series of area, yield, output, value and foreign trade**

Year	Area (1000 ha)	Yield (ql/ha)	Output (1000 t)	Average price received by farmers (€/100 kg)	Value (1) (€ 1000)	Foreign trade (2) (tonnes)	
						Imports	Exports
<b>1985</b>	526.2	64.9	3 413.8	15.74	539 048	3 857 830	1 669
<b>1986</b>	516.1	66.7	3 441.0	17.90	606 608	1 564 237	60 281
<b>1987</b>	532.7	66.8	3 559.3	16.59	593 926	941 807	458 205
<b>1988</b>	549.4	65.6	3 603.7	15.95	568 678	2 243 670	730 643
<b>1989</b>	490.3	68.6	3 361.2	15.54	522 202	1 378 278	456 770
<b>1990</b>	466.3	65.3	3 046.8	16.44	500 823	1 817 789	152 846
<b>1991</b>	484.8	66.7	3 233.3	16.48	532 840	1 680 772	285 424
<b>1992</b>	393.0	70.2	2 757.5	15.41	424 929	1 815 040	146 293
<b>1993</b>	264.5	61.7	1 632.9	17.12	279 501	2 401 345	130 164
<b>1994</b>	341.8	68.6	2 343.6	15.93	373 261	2 376 585	45 708
<b>1995</b>	357.5	72.5	2 590.4	16.65	431 251	3 141 440	118 320
<b>1996</b>	439.7	85.3	3 751.1	15.52	582 326	2 139 275	126 116
<b>1997</b>	487.2	91.4	4 453.7	14.04	625 284	2 547 990	179 770
<b>1998</b>	459.1	94.7	4 349.1	13.79	599 881	2 733 154	176 077
<b>1999</b>	394.9	94.5	3 731.0	14.08	525 389	3 045 421	98 817
<b>2000</b>	433.1	92.2	3 991.8	14.33	572 190	3 629 845	77 546
<b>2001</b>	512.5	97.2	4 981.9	13.64	679 531	2 829 648	166 244
<b>2002</b>	465.1	95.1	4 425.4	13.70	606 276	3 555 711	123 834
<b>2003 (P)</b>	476.2	91.1	4 338.7	14.79	641 694		

(1) The value of breeders' seed is not included.

(P) Provisional.

Source: MAPA.

Maize imports remained constant compared to the figures for 1985. They decreased during the second half of the 1980s, but since the second half of the 1990s they have been showing an upward trend, and production has also been rising.

The rice acreage has grown considerably since the mid 1990s. Between 1985 and 2003 the growth rate went up to 57%, and yields also grew, with the result that output doubled. There was a marked boom in foreign trade, and a considerable flow of exports has been consolidated since the second half of the 1990s.

**Table 5.5 – Rice: historical series of area, yield, output, value and foreign trade**

Year	Area (1000 ha)	Yield (ql/ha)	Output (1000 t)	Average price received by farmers (€/100 kg)	Value (1) (€ 1000)	Foreign trade (2) (tonnes)	
						Imports	Exports
<b>1985</b>	74.6	62.0	462.3	22.57	105 562	23 327	105 361
<b>1986</b>	79.7	63.2	503.8	21.59	108 218	25 362	69 539
<b>1987</b>	78.2	63.1	493.3	24.66	115 244	80 119	157 393
<b>1988</b>	81.4	63.2	514.5	27.06	135 186	66 261	126 331
<b>1989</b>	59.9	58.4	349.6	27.23	95 203	119 366	186 310
<b>1990</b>	90.3	63.1	569.9	25.60	145 878	181 539	184 742
<b>1991</b>	93.7	62.1	581.8	25.42	147 875	78 201	210 768
<b>1992</b>	85.7	64.5	552.6	26.42	146 000	66 855	196 437
<b>1993</b>	47.9	66.3	317.8	32.05	101 842	140 508	161 974
<b>1994</b>	66.3	61.5	407.6	38.18	155 631	176 695	102 663
<b>1995</b>	54.5	69.9	329.5	35.92	118 345	193 473	175 429
<b>1996</b>	105.1	69.8	734.0	33.56	246 334	158 231	163 489
<b>1997</b>	113.6	68.3	775.6	31.37	243 328	90 859	260 549
<b>1998</b>	112.7	70.7	796.3	29.01	233 334	94 455	310 669
<b>1999</b>	110.5	74.0	817.3	27.70	226 397	97 721	309 631
<b>2000</b>	117.0	70.7	827.1	27.44	226 961	98 210	268 891
<b>2001</b>	115.6	75.8	876.1	27.90	244 432	91 385	259 586
<b>2002</b>	113.5	72.2	818.9	27.51	225 285	81 601	317 716
<b>2003 (P)</b>	117.5	72.8	855.0	27.48	234 954		

(1) The value of breeders' seed is not included.

(2) In processed equivalent.

(3) (P) Provisional.

Source: MAPA.

## 5.2 – Foreign trade in cereals

Spain's imports are composed mainly of wheat and maize. Wheat comes from other EU member countries, in particular France, the UK and Germany, although imports also come from former USSR countries (Russia, Ukraine, Kazakhstan) and high-protein wheat comes from Canada. Maize comes from France and third countries, as a consequence of the EU-US Agreement, ratified by the WTO, according to which Spain imports 2 million tonnes of maize and 300 000 tonnes of sorghum per year under preferential conditions from third countries. Exports consist mainly of durum wheat or semolina and certain maize derivatives.



Trade with European countries is carried out through national middlemen in the country of origin or destination, while trade with third countries is carried out through the participation of the major world wholesalers.

Within the EU France and the UK have become Spain's "major cereals partners". Both countries pursue a constant commercial strategy in which their national organisms – ONIC and HGCA – play an important role.

**Table 5.6 – Wheat: Spanish foreign trade, by country (tonnes)**

Country	Imports			Exports		
	2000	2001	2002	2000	2001	2002
<b>Total</b>	<b>2 729 078</b>	<b>4 157 107</b>	<b>6 475 891</b>	<b>464 872</b>	<b>883 446</b>	<b>1 216 929</b>
<b>EUROPEAN COUNTRIES</b>						
Germany	57 614	366 006	246 582	24 223	68 882	79 741
Austria		24	24			
Belgium & Luxemburg	4 373	174	1	6 154	12 155	37 239
Denmark	2	31 979	13 197			
France	1 355 273	1 439 439	837 667	127 568	214 138	241 219
Greece		8 325	94 870	3 911	639	786
Ireland	7					
Italy	630	3 281	6 766	146 538	372 934	234 902
Netherlands	74	6	3 003	12 688	21 231	17 086
Portugal	90 027	172 541	210 556	67 322	82 517	83 450
United Kingdom	902 929	545 635	489 857	10 602	16 570	25 857
Sweden	3 885	118 641	51 187	2 075	8 883	6 019
Hungary			537			
Latvia			11 068			
Lithuania			36 263			
Poland			24 875	24	618	823
<b>European Union</b>	<b>2 414 813</b>	<b>2 686 051</b>	<b>2 026 452</b>	<b>401 105</b>	<b>798 567</b>	<b>727 122</b>
Bulgaria		4 143	445 939			
Romania		18 679	70 157		24	19
Turkey	26 140					15 846
<b>THIRD COUNTRIES</b>						
Argentina	1 915	503	45 424		19	46
Australia						
Canada	179 555	187 419	76 859			
United States	99 817	455 581	354 371			
Norway					8 630	4 707
Switzerland				14 191	1 233	1 575

Source: Statistics on Spanish Foreign Trade. Customs and Special Taxes Department.

Foreign trade in wheat has grown considerably since Spain joined the EEC, although imports have increased much more than exports. The trade balance is persistently negative. Further details are as follows:

- Wheat imports consist of three fundamental categories: high-protein wheat (imported mainly from Canada and Germany), common wheat (imported mainly from France and, to a lesser extent, from the UK) and wheat for cattle fodder (UK, France and third countries).
- Imports from the European Union have remained relatively stable – between 2 and 3 million tonnes.
- Within the European Union, France is the main supplier, followed by the UK and, to a much lesser extent, Germany. The first two countries have become indispensable suppliers of the Spanish market.
- Italy is the only country with which there is a relatively stable trade surplus.
- With the exception of high-protein wheat, purchases from third countries are erratic, being effected only when they are needed in order to compensate for the lack of either an adequate Spanish harvest or imports from the EU. The US and Canada are the most stable suppliers, but purchases are made from different countries according to commercial opportunities, as has been the case for several years with Russia and Ukraine.
- The increase in exports reflects a growing role of Spanish operators on the international market, particularly in the EU.
- Exports consist mainly of durum wheat and semolina. Foreign trade in flour is limited.

Foreign trade in barley is more limited and is also concentrated mainly in the EU. It is due to other cereals deficits on world markets.

Maize imports are high and indispensable for Spanish meat livestock development. Currently France is the main supplier, followed by Argentina and Brazil. Intensive livestock breeding in Spain and French cereals production almost form a production system per se, and Spain has become one of France's primary customers.

**Table 5.7 – Maize: Spanish foreign trade, by country (tonnes)**

Country	Imports			Exports		
	2000	2001	2002	2000	2001	2002
<b>WORLD</b>	<b>3 629 845</b>	<b>2 829 648</b>	<b>3 555 711</b>	<b>77 546</b>	<b>166 244</b>	<b>123 834</b>
<b>EUROPEAN COUNTRIES</b>						
Germany	190	12 794	569	41	115	210
Austria	1 268	1 138	8	2 194		
Belgium & Luxemburg	16	16	18		2 947	142
Denmark			27			1 503
Finland			27			
France	1 878 897	1 395 750	2 186 460	6 095	3 976	3 330
Greece	31		51 273	365	409	357
Ireland						11 397
Italy	19 210	2 025	4 154	697	1 537	2 095
Netherlands	305	1 046	1 050	60	22	3 922
Portugal	29 678	4 085	17 756	59 401	156 531	92 324
United Kingdom	230	271	2 912	34	4	7 820
Sweden		273		1	3	1
Cyprus						6
Slovakia			8		10	
Hungary	197 052	202	207 773		91	
Poland				8 287		10
<b>EU</b>	<b>2 126 877</b>	<b>1 417 599</b>	<b>2 472 032</b>	<b>77 176</b>	<b>165 646</b>	<b>123 117</b>
Bulgaria	9 407	–	–	–	–	–
Romania	34 737	–	–	–	–	–
Turkey	483	1 341	2 194	–	1	1
<b>THIRD COUNTRIES</b>						
Argentina	1 433 303	560 261	718 018	–	–	–
Brazil	18	774 027	290 560	–	–	–
Canada	56	61	127	–	–	–
United States	22 278	6 801	5 579	–	–	1
Japan	–	–	–	–	114	39
Switzerland	–	–	–	–	4	1

Source: Statistics on Spanish Foreign Trade. Customs and Excise Department.

### **5.3 – Cereals consumption**

According to the White Book on Agriculture and Rural Development, average cereals consumption shows the following pattern:

- Human consumption is around 4.2 million tonnes, of which 3.7 million tonnes are common wheat for flour and 450 000 tonnes of durum wheat are for semolina.
- Barley consumption for malts and industrial uses amounts to 2.2 million tonnes.
- 1.2 million tonnes are for seeds.
- Around 13 million tonnes of cereals are for cattle fodder.

The main components of cereals consumption are animal fodder and grain-mill products for human consumption: flours, semolina and malts. There are other forms of human consumption (breakfast cereals, isoglucose in the case of maize, etc.) and several industrial uses, and a certain quantity is now also used for producing energy. Rice production must be added to this scenario; the bulk of output is used for human consumption. All of these forms of consumption are intermediate, so that the final product markets for meat and other farm products, pasta, bread, bakery products and beer are those which set the conditions for the cereals market.

#### **5.3.1 - Fodder demand**

Total fodder production amounts to almost 20 billion tonnes, more than 40% goes to swine, 26% to bovine and 23% to poultry. Fodder demand depends directly on livestock development and organisation on the one hand and pet food demand on the other. Livestock numbers are growing in general, particularly livestock for fattening, and this consolidates the livestock fodder and meat sector in various Autonomous Communities in Spain.

**Table 5.8 – Mixed fodder consumption in Spain (tonnes).  
Exclusive of premixes**

	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003 (*)</b>
Pigs	6 785 411	7 730 660	7 732 860	8 137 137	8 235 000
Bovine animals	4 380 203	5 026 286	4 748 230	5 246 130	5 050 000
Sheep, goats, equine animals and others	1 164 358	1 417 671	709 441	809 658	845 000
Rabbits			790 000	790 000	760 000
Poultry	3 794 304	4 015 685	4 388 186	4 559 170	4 425 000
Fish, marine animals	99 923	90 417	117 786	105 717	110 000
Subtotal for farm animals	16 224 199	18 280 719	18 486 503	19 647 812	19 425 000
Subtotal for pets	289 513	433 116	449 591	128 279	421 416
<b>TOTAL FODDER</b>	<b>16 513 712</b>	<b>18 713 835</b>	<b>18 936 094</b>	<b>19 776 091</b>	<b>19 846 416</b>

(\*) Estimates.

Source: Market Statistics. Spanish Confederation of Animal Feed Compounders (CESFAC). Based on data from the MAPA Technical General Secretary, 2003.

Pig and cattle feed consumption has grown in the last few years, while poultry feed consumption has fallen.

**Table 5.9 – Share of each type of livestock in fodder destination (%)**

	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003(*)</b>
Pigs	41.82	42.29	41.83	41.41	42.39
Bovine animals	27.00	27.50	25.68	26.70	26.00
Sheep, goats, equine animals and others	7.18	7.76	3.84	4.12	4.35
Rabbits	0.00	0.00	4.27	4.02	3.91
Poultry	23.39	21.97	23.74	23.20	22.78
Fish, marine animals	0.62	0.49	0.64	0.54	0.57
<b>Total farm animals</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

(\*) Estimates.

Source: European Feed Manufacturers' Federation (FEFAC ) and CESFAC, 2003.

Fodder demand is conditioned by livestock development, whose main characteristics in the past few years have been as follows:

- The bovine livestock headage increased by 27% between 1991 and 2001 due to:
  - an increase in the number of mother cows, which need fodder to supplement grazing;
  - the fattening of all or part of the calves born on farms producing mother cows;
  - a considerable increase in the number of animals younger than 12 months: 42% between 1991 and 2001; most of these animals go for intensive fattening, which provides the largest share of meat for consumption.
- The pig headage grew by 39% between 1991 and 2001, and the vertical integration system was consolidated, which means in particular an increase in the captive market share.
- The number of chickens for fattening also rose significantly.
- Egg production dropped by 12% during the 1990s.
- Significant growth in intensive livestock production began in areas in the interior of the country where human population density is low, opening up a new opportunity for development.

Between 60% and 65% of the fodder market is part of a “captive market”, which consists of fodder going to integrated livestock<sup>2</sup>. Pet food accounts for less than 1% of the total, although it is a sector which provides more margins for producing companies.

### ***5.3.2 – Consumption of flours and semolina derivatives: pasta, bread and bakery products***

Flour and semolina consumption is directly related to the consumption of flour and semolina derivatives: pasta and bread, bakery products, biscuits and pastry. Both direct consumption and consumption in the rest of the agro-food industry is limited. Some flours are also used in the non-food industry.

Wheat flour output grew steadily during the second half of the 1990s, amounting to 2.9 million tonnes by 2002 (National Statistics Institute - INE), which was an increase of around 20%.

More than 90% of the total volume of bread consumed is fresh bread, but fresh bread consumption showed a downward trend from the beginning of the 1980s until 1992-1993, dropping from 65 kg per person per year to less than 55 kg. Since then consumption has increased slightly, amounting to 57 kg per person in 2003<sup>3</sup>. It can also be pointed out that the consumption of quality bread increased throughout this period and supply became more varied. A very important development is the increase in the consumption of frozen bread, which is changing production chain organisation.

---

<sup>2</sup> In the integrated livestock sector, the integrating company, usually the fodder producer, is also the owner of the livestock and establishes a service contract with the integrated farmer, who agrees basically to supply labour and installations.

<sup>3</sup> According to producers, this is due to immigration.

The consumption of biscuits, bakery and pastry products and pasta is much lower than bread consumption, but followed a very similar dynamic:

- The total consumption of biscuits and bakery and pastry products is currently over 561 million kg. It dropped slightly, but then recovered with the new varieties on the market.
- Pasta consumption amounts to over 183 million kg with annual fluctuations. It has also been influenced by new varieties and new competitors.
- All of these products are mainly consumed at home, although pasta consumption in hotel and restaurant channels and institutions is quite high (almost 16.5%). The share of unpacked bread consumed in the home is 83%.

## **5.4 – Cereals production in Spain**

### **5.4.1 - Areas and cereals output in Spain**

The area dedicated to cereals decreased by almost 1 200 000 hectares in the period under review, a decrease of more than 11% compared to the figure for 1985. During the same period the area of fallow and non-occupied land dropped by 1 380 000 ha.

**Table 5.10 – Cereals: area, output and value, historical series**

<b>Year</b>	<b>Area (1000 ha)</b>	<b>Output (1000 t)</b>	<b>Value (€ 1000 )</b>
<b>1985</b>	7 591	20 972	3 014 635
<b>1986</b>	7 708	16 520	2 694 674
<b>1987</b>	7 881	20 698	3 156 942
<b>1988</b>	7 887	23 825	3 488 629
<b>1989</b>	7 909	19 700	2 885 387
<b>1990</b>	7 553	18 764	2 764 710
<b>1991</b>	7 813	19 467	2 954 942
<b>1992</b>	7 405	14 498	2 177 569
<b>1993</b>	6 456	17 474	2 568 876
<b>1994</b>	6 490	15 240	2 283 714
<b>1995</b>	6 694	11 571	1 906 501
<b>1996</b>	6 767	22 378	3 148 029
<b>1997</b>	6 990	19 341	2 853 059
<b>1998</b>	6 632	22 574	3 038 056
<b>1999</b>	6 698	18 142	2 485 731
<b>2000</b>	6 807	24 567	3 184 137
<b>2001</b>	6 428	18 055	2 575 447
<b>2002</b>	6 729	21 683	2 894 872

Source: MAPA.

Barley (almost 40%), wheat (over 30%) and maize (20%) make up most of Spanish cereals production. Compared with the figures recorded when Spain joined the EEC, wheat share went up 3 percentage points, barley went down 10 points, maize went up 3 points, rice went up 1 point and the rest fell. The decrease in barley production was mainly in the 6-row variety, while the 2-row variety remained stable.

**Table 5.11 – Shares of cereals (%) (2002)**

	Dry land	Irrigated area	Total area	Output
<b>Wheat</b>	38.87	20.29	35.77	31.46
<b>Barley</b>	49.87	27.26	46.09	38.57
<b>Rice</b>	0.00	10.09	1.69	3.78
<b>Maize</b>	0.59	38.42	6.91	20.41
<b>Other</b>	10.67	3.94	9.54	5.78

Source: Authors' own elaboration based on MAPA data.

The durum wheat acreage increased considerably from the early 1990s onwards to the detriment of strong common wheat, and this affected foreign trade. This growth continued throughout the 1990s, with the result that acreage has increased sixfold since Spain joined the EEC.

Barley and wheat are produced mainly on dry land, both crops occupying almost 90% of farmed acreage on dry land, and only around 10% of the area is irrigated. Maize and rice are grown almost exclusively on irrigated land.

Wheat, barley and oats yields differ considerably, depending on whether the crops are grown on dry or irrigated land.

**Table 5.12 – Cereals: national summary of area, yield and output, 2002**

Crops	Area (ha)			Yield (kg/ha)		Output (tonnes)	
	Dry	Irrigated	Total	Dry	Irrigated	Grain	Straw
<b>WINTER CEREALS</b>							
Total wheat	2 178 325	228 318	2 406 643	2 677	4 344	6 822 160	3 455 667
Total barley	2 794 859	306 665	3 101 524	2 528	4 228	8 362 328	4 691 444
Oats	422 441	32 744	455 185	1 853	2 990	880 705	514 401
Other (*)	168 127	6 923	175 050	9 990	13 143	337 020	211 965
<b>SPRING CEREALS</b>							
Rice (husk)	2	113 466	113 468	3 200	7 217	818 920	–
Total maize	32 938	432 196	465 134	4 093	9 927	4 425 373	–
Other (*)	7 274	4 703	11 977	6 559	14 373	36 209	
<b>CEREALS TOTAL</b>							
	<b>5 603 966</b>	<b>1 125 015</b>	<b>6 728 981</b>	–	–	<b>21 682 715</b>	<b>8 873 477</b>

Source: MAPA.



The irrigated area amounts to around 17% of the total area and accounts for 35% of output (2002). The share of irrigated area for all cereals has gone up 4 points since Spain joined the EEC, due both to a decrease in farmed dry land in absolute terms and to a slight increase in irrigated land.

#### **5.4.2 – Geographic distribution of cereals production**

We shall now analyse specifically the geographical areas for the more important types of cereals.

The wheat acreage is concentrated in five Autonomous Communities, accounting for 88% of farmed land (84% of irrigated land) and 84% of production (2002 figures). Greater yields on dry land, above 3 500 kg/h, are achieved in the Basque Country, Navarre, La Rioja, Catalonia, the north of Aragon, the north of Castile and Leon and the Guadalquivir Valley in Andalusia; these areas will probably be the main wheat-growing areas in the future. On the other hand, yields in several regions where large areas are dedicated to wheat are low: most of Castile-La Mancha, the south of Castile and Leon and the south of Aragon; here, farming prospects would seem rather problematic in view of the changes in the CAP.

**Table 5.13 – Wheat: area, yield and output – analysis by province, 2002**

Autonomous Communities	Area (ha)			Yield (kg/ha)		Grain crop output (tonnes)	Harvested straw (tonnes)
	Dry land	Irrig.	Total	Dry	Irrig.		
BASQUE COUNTRY	27 460		27 460	5 900		162 012	135 000
NAVARRRE	69 697	8 615	78 312	3 845	4 398	305 876	155 996
LA RIOJA	29 732	4 973	34 705	4 252	5 000	151 285	127 075
ARAGÓN	285 307	42 286	327 593	979	3 982	447 704	158 860
CATALONIA	62 723	14 410	77 133	3 916	4 725	313 682	193 728
CASTILE AND LEÓN	681 501	53 485	734 986	2 860	4 448	2 186 814	1 205 041
MADRID	24 676	1 360	26 036	2 700	4 500	72 745	87 294
CASTILE–LA MANCHA	284 938	41 873	326 811	2 216	4 675	827 185	502 954
EXTREMADURA	149 010	5 700	154 710	3 716	3 883	575 830	172 749
ANDALUSÍA	529 011	49 580	578 591	2 775	4 285	1 680 535	643 515
REST	34 270	6 036	40 306			98 492	73 455
SPAIN	2 178 325	228 318	2 406 643			6 822 160	3 455 667

Source: MAPA.

In the 2002 farm year the area dedicated to durum wheat accounted for 38% of wheat area and its output for 31%. Yields were somewhat lower.

The area dedicated to durum wheat is concentrated in Andalusia, with more than 55%, and Aragon (25%), followed at some distance by Extremadura and Castile-La Mancha. The bulk of output is concentrated in Andalusia: 70%.

The cool dry lands of Andalusia were the main production area for strong common wheat, supplying the Spanish flour market and, during the first years that Spain was an EEC member they increased their exports to the other European markets. Durum wheat development has been tied to the differential subsidy, and this was done at the expense of strong common wheat, with the result that most durum wheat now has to be imported. A change in this subsidy will probably mean a return to strong wheat growing.

**Table 5.14 – Wheat: analysis by province of area and output according to grain hardness, 2002**

Autonomous Communities	Durum wheat		Common & medium wheat	
	Area (hectares)	Output (tonnes)	Area (hectares)	Output (tonnes)
BASQUE COUNTRY			27 460	162 012
NAVARRRE	14 145	9 403	64 167	296 473
LA RIOJA	179	801	34 526	150 484
ARAGÓN	232 256	212 549	95 337	235 155
CATALONIA	70	291	77 063	313 391
CASTILE AND LEÓN	17 361	36 556	717 625	2 150 258
CASTILE–LA MANCHA	46 848	82 575	279 963	744 610
EXTREMADURA	96 800	321 503	57 910	254 327
ANDALUSÍA	516 900	1 486 933	61 691	193 602
REST	1 625	2 584	64 717	168 653
SPAIN	926 184	2 153 195	1 480 459	4 668 965

Source: MAPA.

Barley is concentrated in two Autonomous Communities, Castile and Leon and Castile-La Mancha, and together they account for 70% of area and production. Yield distribution is quite similar to that of wheat.

**Table 5.15 – Barley: area and output - analysis by province according to grain hardness, 2002**

Autonomous Communities	Area (hectares)			Yield(kg/ha)		Grain output (tonnes)	Harvested straw (tonnes)
	Dry	Irrig.	Total	Dry	Irrig.		
BASQUE COUNTRY	13 529		13 529	5 650		76 439	70 000
NAVARRRE	94 879	6 510	101 389	2 751	3 610	284 513	142 265
LA RIOJA	16 158	3 560	19 718	2 395	4 600	55 074	41 306
ARAGÓN	320 686	50 423	371 109	2 269	3 343	896 084	272 479
CATALONIA	175 331	17 853	193 184	3 493	5 271	706 477	389 272
CASTILE AND LEÓN	1 185 793	99 114	1 284 907	2 256	4 120	3 083 857	1 763 132
CASTILE–LA MANCHA	759 808	104 549	864 357	2 931	4 813	2 730 315	1 643 753
EXTREMADURA	46 100	2 900	49 000	3 190	3 793	158 047	79 024
ANDALUSÍA	82 084	10 759	92 843	1 575	3 276	164 531	82 873
REST	100 491	10 997	111 488	13 873	15 494	206 991	207 340
SPAIN	2 794 859	306 665	3 101 524			8 362 328	4 691 444

Source: MAPA.

Rice is grown in five Autonomous Communities: Andalusia (35%), Extremadura (23%), Catalonia (19%), Comunidad Valenciana (13%) and Aragon (9%). In all of these regions the land is of great ecological value, and they all receive specific agro-environmental grants. Agriculture is expanding in emergent regions, Andalusia and Extremadura, where farm structures are better; the long-grain variety is grown in those areas.

**Table 5.16 – Maize: area and output – analysis by province according to grain hardness, 2002**

Autonomous Communities	Area (hectares)			Yield (kg/ha)		Output (tonnes)
	Dry	Irrigated	Total	Dry	Irrigated	
GALICIA	24 715	235	24 950	3 838	5 500	96 160
NAVARRRE	249	11 676	11 925	4 425	8 361	98 725
ARAGON	51	78 707	78 758	3 785	8 471	666 957
CATALONIA	4 614	37 608	42 222	6 129	10 367	418 172
CASTILE AND LEON	462	126 396	126 858	4 987	9 337	1 182 446
MADRID	13	9 414	9 427	3 500	11 500	108 307
CASTILE–LA MANCHA	83	48 013	48 096	3 562	12 234	587 708
EXTREMADURA		67 000	67 000		9 715	650 900
ANDALUSIA	614	50 060	50 674	3 583	11 700	587 896
REST	2 137	3 087	5 224			28 102
SPAIN	32 938	432 196	465 134			4 425 373

Source: MAPA.

The maize area is concentrated in 6 Autonomous Communities: Castile and Leon, Aragon, Extremadura, Andalusia, Castile-La Mancha and Catalonia, which together account for 94% of acreage and 92% of output.

The main change that took place following Spanish accession to the EEC was the marked expansion of agricultural activity in Castile and Leon, where acreage increased from less than 5% to almost 30%. This process is related to the expansion of livestock breeding in the region, and the trend is likely to continue due to the decrease in land dedicated to beet as a result of the new trends anticipated in the WTO.

### 5.4.3 – Farm characteristics

According to the 1999 Agrarian Census, there are 434 720 cereal farms in Spain, i.e. 26% of farms with Agricultural Area in Use (AAU)<sup>4</sup>. On 82% of these cereal farms all of the land is dry, and there are 136 834 farms with at least one irrigated area. Cereal farms account for a total of almost 7 million ha, of which less than 1 million are irrigated.

**Table 5.17 – Cereal farms according to production method**

Size AAU (ha)	Total		Dry		Irrigated	
	Farms	ha	Farms	ha	Farms	ha
Farms with land	434 720	6 999 423	354 918	6 006 859	136 834	992 564
> 0.1 to < 0.2	2 513	160	1 708	102	833	57
> 0.2 to < 0.5	11 782	1 618	7 497	884	4 586	735
> 0.5 to < 1	20 673	5 857	12 973	3 147	8 570	2 710
> 1 to < 2	35 328	20 218	23 831	12 066	13 388	8 152
> 2 to < 3	27 445	27 039	19 819	17 391	9 130	9 648
> 3 to < 4	22 754	31 757	17 033	20 742	7 078	11 014
> 4 to < 5	19 256	35 121	14 739	23 290	5 763	11 831
> 5 to < 10	66 856	194 682	53 453	135 840	18 909	58 841
> 10 to < 20	70 735	430 636	59 092	317 974	20 980	112 662
> 20 to < 30	37 524	426 782	32 806	338 172	11 536	88 610
> 30 to < 50	39 980	762 489	36 383	641 817	12 382	120 671
> 50 to < 70	21 492	628 681	20 132	549 036	6 553	79 646
> 70 to < 100	18 698	766 331	17 668	684 566	5 557	81 766
> 100 to < 150	16 114	936 861	15 377	848 079	4 587	88 781
> 150 to < 200	7 710	595 919	7 362	540 117	2 339	55 802
> 200 to < 300	6 861	664 625	6 533	600 243	1 978	64 382
> 300 to < 500	4 718	575 096	4 485	512 061	1 344	63 036
> 500 to < 1000	2 982	495 468	2 806	424 809	883	70 659
> 1000	1 299	400 083	1 221	336 522	438	63 561

Source: 1999 Agrarian Census.

<sup>4</sup> The White Paper on Agriculture and Rural Development (MAPA 2003) states that 358 000 farms are receiving compensatory grants.

There is a high degree of farm fragmentation: 32% of farms have less than 5 hectares of AAU and together total less than 2% of the total area. At the other extreme, over 9% of farms have more than 100 hectares and account for 52% of the total area. Almost 11% of the farms which are entirely on dry land have more than 100 hectares, accounting for 54% of the area, and those larger than 500 hectares, which is the profitability threshold, will face tougher WTO rules in the medium term; these farms account for around 1% of farms and almost 13% of the total area.

There are 153 277 holdings whose economic and technical orientation (ETO) is "cereals and oleaginous and leguminous plants"; 35% of these farms include cereals in their crops. This collective structure is also very deficient: 75% have less than 16 European Size Units, a figure that can be considered the threshold for achieving a certain degree of modernisation and professionalism in farming activities; less than 0.75% of farms have over 40 ESU, yet they account for 41% of AAU.

**Table 5.18 – Farms whose ETO is "cereals and oleaginous and leguminous plants"**

ESU	Farms	AAU (ha)
Total	153 277	6 998 519
< 1	24 626	49 070
1 to < 2	17 373	91 712
2 to < 4	22 571	233 744
4 to < 6	14 874	248 632
6 to < 8	10 978	257 022
8 to < 12	15 628	518 865
12 to < 16	10 159	477 132
16 to < 40	25 849	2 208 275
40 to < 60	5 841	957 557
60 to < 100	3 351	835 821
> 100	2 027	1 120 688

Source: 99 Agrarian Census.

This fragmented structure explains why there is such small degree of professionalism among the existing cereals farms. In the case of those specialising within this ETO, the situation is as follows:

- The average work volume is less than half a YWU (Year-Work Unit), which makes professionalism difficult.
- Only holdings with an economic size of more than 40 EUD count on more than one YWU, and this goes for 0.75% of farms and 41% of the area.
- There is a high degree of ageing: less than 45% of farm owners are under 45 years of age and 30% are over 65. Ageing is lower in the case of the largest farms.
- Owner dedication to the farm is very low: almost 62% of farm owners dedicate less than 25% of their time, and less than 20% of farmers dedicate more than

75%. The scenario changes completely with farms larger than 12 ESU, where dedication increases appreciably.

In response to this situation, which makes farming unfeasible on most farms, agrarian tasks – even farm management – are being outsourced to a large extent in a process affecting farms of all sizes except for the biggest ones. In fact, management concentration is greater than farm concentration. This process is not reflected in any available statistics or well defined, but it is leading to a network of services companies in agriculture, which is demonstrating a high degree of efficiency; in certain cases cooperatives provide these services by developing “crop sections”.

An indicator of this process is the number of farms that use machinery from other companies: 37% of all farms with AAU use tractors that are not their own and 60% of cereal farms use harvesters which are not their own.

#### ***5.4.4 - Specific characteristics of cereal-growing systems in Spain***

Cereal farming is carried out mainly with a family workforce, although the number of employed wage earners is increasing on larger farms.

Farms are adequately mechanised, although the tractor fleet is very old; in order to address this problem the government has approved several renewal schemes, in which old tractors are bought from the farmers whenever they replace them.

Cereals production on dry land in the more arid regions, which account for half of the cereals acreage in winter, incurs high production costs due to low yields, which could only be improved through economies of scale and measures to reduce input acquisition costs and adapt farming techniques. But it is very difficult to develop such strategies due to farm fragmentation and the lack of organisation, factors which are closely related. According to the results of studies carried out by the MAPA in 2003, costs per tonne in the southern regions were twice as high as those in northern Spain.

The majority of the characteristics of cereal farming in Spain are related to topics analysed above. We shall now underline the more important ones and discuss which of them are going to have greater influence in the future.

#### ***Factors resulting from agro-climatic conditions:***

- The huge yield variations in dry land farming, which are related to the long and recurrent periods of drought, lead to tremendous uncertainty. In order to find a solution to this problem, the Spanish Government launched an Agrarian Insurance Policy in 1980, which is very popular in general; dry land cereal farming has since become one of the most insured sectors of agriculture, with the result that it has now reached the maximum level of insurance possible.

- Agro-climatic variations are a cause of great uncertainty, which is a constraint on input use (fertilisers and certified seeds) in the areas where risks are greater.
- The use of certified seed for common wheat and barley is very limited, around 25% of the total, although it has doubled in the course of the last 10 years. This means that both varietal innovation and purity are low, which creates a classification problem.
- Due to the climatic diversity throughout the Iberian peninsula there is a very wide range of varieties, much wider than in other countries; this makes for genetic wealth but makes it difficult to homogenise crops and ensure crop quality.
- Besides yields, quality is also very variable due to irregular water supply in the areas with the lowest yields. This irregularity makes non-homogeneous harvests more difficult to sell despite the protein level obtained from the high sunshine.
- In the case of dry land crops, especially in areas with lower yields, fallow land techniques are quite widely used and are fundamental for maintaining soil fertility.
- Erosion is the main agro-climatic problem faced by cereal farming on dry land; one way of coping with this problem, in addition to measures such as reducing fuel consumption and more effectively retaining the low level of humidity of most of the soils, is to develop no-tillage or direct sowing techniques; these techniques are rapidly expanding, particularly on farms with more than 40 hectares of herbaceous crops.
- Cereals grown on irrigated land, especially maize, in regions with better yields and qualities, are facing potential restriction of water utilisation for irrigation.
- In Spain more than 60 000 hectares are farmed with genetically modified maize (Bt maize) in order to combat disease, mainly in the Ebro Valley.

*Factors which are the result of farm structure:*

- Farm fragmentation promotes a growing trend to outsource farming work, including farm management; this can greatly increase the number of services companies in the medium term.
- Lack of size makes it quite difficult to achieve economies of scale, so that currently most producers in the southern half of the country have to contend with very high costs, which make it difficult to survive in farming.
- Low professionalism makes it difficult to organise the sector, which is less well organised than in other EU countries. This is evident in the structure of the commercial network.

## **5.5 – The cereals processing industry**

### ***5.5.1 – The milling industry: semolina and flours***

At the end of 2003 there were 209 flour mills and semolina factories distributed throughout the country. They are concentrated more in production areas (Castile-La Mancha, Castile and Leon, Ebro Valley) and near the ports used for cereal imports. The location of capacities in the flour industry is as follows: Ebro Valley (33.01%), Andalusia (19.92%), Castile and Leon (19.27%) and Castile-La Mancha (14.25%). The mills in Andalusia and along the coast obtain their supplies from imported wheat.

This industry location is a key point for the future; it will predictably remain close to the entry ports and to the areas with better average yields (northern Castile and Leon, most of the Ebro Valley, etc.), as mills located in production areas with low yields can be affected by the decrease in output due to the decoupling of aids.

The flour industry has been undergoing restructuring for some time, which has greatly reduced the number of companies: there were almost 500 in 1990 and 310 in 1995. Even now, there is still considerable milling overcapacity – 60% according to AFHSE (Flour and Semolina Producers Association of Spain) – which is weighing down the market.

A threefold process is taking place at the present time: large and medium-sized companies are concentrating, small companies and medium-sized companies in disadvantageous locations are closing down, and small and medium-sized companies that have found a market niche are becoming established. The company shutdowns, which are frequently related to when the owner retires, will probably continue, as will the concentration and growth of the bigger firms.

Due to the poor margins in this sector and the logistic costs inherent in the activity, company concentration will continue in addition to industrial concentration, and this will lead to a few big groups with several factories and a fringe of small local firms, specialising in certain production niches (ecological flours, differential qualities, etc.).

There is no foreign capital in this sector and most of the companies are family-owned, small or medium-sized. With the exception of one leading group, most of the companies are undercapitalised on the whole and their levels of investment are very low. The situation varies: one large leader company which owns several factories, a fringe of viable, fairly large companies, and a large segment of small companies, which are unlikely to survive in the medium term, except for those which find specific niches.



The semolina-producing subsector consists of nine factories located in Andalusia, Catalonia and Aragon, which belong to five different companies, three of which also make pasta. The companies in the latter two regions could be affected by the evolution of durum wheat production in a scenario of decoupling of aids. The installations are generally modern and capitalised.

### **5.5.2 – The fodder industry**

There are 808 fodder companies according to the INE, while the CESFAC estimates up to 1 000, counting as fodder industries all farms producing fodder. But despite this fragmentation it is a rather concentrated sector, where the leader company has a share of 25% of fodder production, the first ten account for between 50% and 60%, and the firms affiliated to the CESFAC – almost 300 – account for over 80%.

Except for cases where there are specific market niches, small companies and those with no integrated livestock have poor margins and a precarious existence and face a difficult future, since working conditions have become more stringent due to the new food safety regulations applied to fodder. The concentration process in this subsector will thus probably accelerate.

The larger companies focus on fodder production for intensively produced livestock: pigs, poultry and bovine animals for fattening. They all have integrated livestock as a way to make fodder profitable by selling meat, but the livestock and fodder production sections within their structures are not always adequate. Due to the importance of their relations with integrated farmers, they have developed a considerable network of extension services. There are frequent conflicts with integrated stock breeders over the amount of income the latter earn, production rhythms, fodder quality, etc.

Currently there are around 20 fodder companies that use the certified CESFAC seal on their product, i.e. almost 20% of total production. This is the certified volume, and it is increasing rapidly.

The main fodder-producing areas are as follows:

- Catalonia (30%);
- Castile and Leon (15%);
- Galicia (11%);
- Aragon (10%);
- the triangle formed by Catalonia, Aragon and Comunidad Valenciana, accounting for 45%.

The Spanish Agrarian Cooperatives Confederation quotes the figure of 170 fodder cooperatives, most of them located in the Autonomous Communities of Andalusia, Catalonia, Castile-La Mancha, Castile and Leon and Galicia. They include big companies managed by integrated stock breeders (cooperative members and non-members), small cooperatives which do not include livestock and supply to a more or less integrated livestock market, and a collective of very small cooperatives.

It can be said that there is generally no connection between fodder cooperatives and cereal producers, except in the case of some large level-1 and level-2 co-operatives which have integrated their fodder and cereals sections. Together co-operatives provide 35% of total fodder production.

### **5.5.3 - Malt houses**

The malt industry is very concentrated, with sizeable companies located near production areas. Most of them belong to beer producers, although producer cooperatives also participate in some of the biggest ones.

## **5.6 – The commercial network in the cereals sector**

The first step in cereals trading is carried out by co-operatives, which handle approximately one-third of the total volume, and wholesalers, which handle two-thirds of the volume. Virtually no industries buy direct from the farmer.

It is the wholesalers who manage most of the storage capacities, and in many cases it is also they who supply seed and other inputs to farmers. The larger companies have been dealing in part of European cereals imports since the beginning of the nineties.

The number of wholesalers trading in cereals is very high – estimated by several experts on the sector at around 2 000. The wholesalers comprise a large number of very small firms which simply act as local middlemen, selling their goods to larger wholesalers.

A similar situation is found in cooperatives, a segment where many level-1 cooperatives collect rather small quantities, which they sell or, in some cases, simply pass on to level-2 cooperatives or wholesalers for them to sell.

The number of sizeable wholesalers is quite limited – only 25–30 operators, both large cooperatives and ordinary wholesalers. Their characteristics differ according to their legal status; the main features are described below.

There is a large number of level-1 cooperatives which trade cereals, though for many cereals are a second-tier product. The Agrarian Cooperatives Confederation of Spain says there are 464 co-operatives dealing in herbaceous crops with a share of around one-third of the cereals market. There are also 12 level-2 co-operatives, which handle large volumes and are very important on the cereals market. These companies are located primarily in cereal-producing areas; the largest share of co-operative structures in the cereals trade is found in Navarre and Extremadura, with more than 60%, and Castile and Leon (40%).

Cereals trade co-operatives have only weak links with those producing fodder. Only a few of them have a sizeable fodder manufacturing section.

There is a large number of these cooperatives in the cereal wholesalers sector (Trading Companies), but only 180 of them are members of the Spanish Association of Cereals and Oleaginous Traders (ACCOE). Around 40% of them can be considered medium-sized or large. They are located near the production and consumption areas.

The cereals traders also include large importers, which are big multinational companies operating on international markets. They deal on the oleaginous markets, and are related to the fats subsectors. Their share of common and durum wheat is low; some of them are big livestock multinationals. It is they which account for most imports from third countries, but they do not deal on the domestic market or on intra-European markets.

The Spanish cereals trade network has major deficiencies, which affect the organisation and efficiency of the market:

- Although there are adequate storage capacities for the needs of the Spanish market and for crop storage, there are no segmented storage capacities which would allow different qualities to be identified.
- In most cases, the commercial network does not have any cereals quality analysis systems, a fact which promotes lack of qualification on the market and prevents farmers from being paid according to quality.
- Logistic organisation is deficient, increasing costs and exacerbating the effect of rising fuel prices.
- Smaller companies lack qualified personnel (management, marketing staff).

The situation is different in areas with better yields and higher output, where the best companies are located.

The market in cereals produced in Spain is conditioned both by farmer characteristics and by the marketing network and has to contend with major problems.

- It is not a well-organised market.
- There are two markets in the course of the year: the – very disorganised – two-month market following the harvest, and the market during the rest of the year, where larger cooperatives and wholesalers play a more important role.
- There is hardly any product identification or medium-term supply agreements.
- There is no national system for quality grading.

The characteristics of the imported commodity market are quite different:

- Imports from the European Union are effected by Spanish and European operators, in some cases with the participation of inter-professional organisations from the countries of origin. They consist of identified and homogenised goods, with a bonus for medium-term agreements. Stable flows from France and the UK have consolidated. Prices are usually higher.
- Maize imports from third countries are effected through the biggest wholesalers on the international markets. Purchases and supply agreements are concluded for future markets, where euro/dollar fluctuations are a fundamental feature.

### **5.7 – Organisation of the sector**

The cereals sector is structured around three professional agrarian organisations, which are horizontal in structure and have been recognised by the Ministry of Agriculture, Fisheries and Food: the Agrarian Association of Young Farmers (ASAJA), the Coordination of Farmer and Stockbreeder Organisations (COAG) and the Small Farmers' Union (UPA). Each of them has an officer responsible for this sector and a minimum technical support structure. However, their involvement in the sector is rare and only for short periods; it is usually related to WTO modifications, and they pay little attention to all other aspects.

Currently the main moot point is how the modulation of aids is to be applied. The agrarian organisations' stance on the decoupling of compensatory aids has changed in the course of the debate, and a clear position in favour has been adopted.

The three organisations are integrated within the Wheat, Flours and Bread Inter-professional Organisation (INCERHPAN), but their participation is very limited. For instance, they do not contribute towards running expenses and did not participate in the agreement to pay for a advertising campaign to boost bread consumption. The same three organisations are taking part in talks with a view to forming an inter-trade organisation of fodder producers.

There are also several organisations with specific aims, either manufacturing (maize processors) or a crop system (Spanish Association of Conservation Agriculture, AEAC-SV).

The organisation of companies in other phases of the production chain is easier.

- Trading companies are associated within the Agrarian Cooperatives Confederation of Spain (CCAE), which has a Cereals Sector Board, and within the Cereals and Oleaginous Traders Association of Spain (ACCOE).
- The staple commodities industry is organised in different associations according to product: flour and semolina manufacturers, fodder manufacturers, malt producers, etc... All of them belong to the Food and Beverage Industries Federation (FIAB).
- The manufactured products industry also has its own associations: traditional bread manufacturers, frozen dough manufacturers, etc...

There is only one inter-professional organisation for the time being, INCERHPAN, which is endeavouring to reach an agreement to finance a campaign to promote bread consumption. An inter-trade organisation is in the making in the fodder sector.

There is also the Spanish Association of Cereals Technicians (AETC), which deals with topics related to the quality and improvement of cereal farming and the cereals industry.

## **5.8 – The impact of the CAP reform and outlook**

The three points that will have an important impact on the cereals sector are the WTO modifications, the application of food safety requirements (traceability and hygiene standards) and agro-environmental measures.

The effects of the WTO modifications are due to two main issues:

- the decrease in the amount of the compensatory subsidy resulting from the freezing of the amount until 2013, which means losing inflation compensation;
- the 75% decoupling of compensatory aids and the application of one single payment per farm.

These two issues are important due to low cereal yields on dry land in Spain, which lead to high unit costs, and the activity will therefore become very fragile in view of the drop in subsidies. According to Ministry of Agriculture estimates in the White Paper on Agriculture and Rural Development (2003), the average costs for wheat and barley farming on dry land were around €200 per tonne in most regions, with the exception of the north of Castile and Leon and the most productive areas in the north of the Ebro Valley.

A result of the application of the decoupling measures can be that in areas where production costs (operating costs) are higher than the sum of sales plus 25% in the form of compensatory aid, farmers will stop farming unless measures can be introduced to reduce costs. Areas where average annual yields are lower than 1 200-1 500 kg/ha can find themselves in this situation; the MAPA identifies 42 such areas, although most of them are low-yield areas. With yields between 1 500 and 3 000 kg/ha, structural adjustments should be made and farming systems should be modified.

In order to evaluate the effects of the new situation, the structural situation of farms must be taken into account, i.e. basically the combined effects of the high fragmentation rate, old age and scant farmer dedication, plus the problems that stem from the insufficient professional organisation of the sector (low presence of cooperatives, few big cooperatives at levels 1 and 2, a commercial network that is not particularly efficient and low activity of inter-professional organisations).

Adaptation to the new agro-environmental requirements has been remarkably successful and the application of good agrarian practices is widespread. In general, agro-environmental programmes related to cereals are having considerable success. However, the application of traceability standards can be more difficult due to the existing lack of commercial organisation.

From the environmental point of view, the main risk for Spanish dry lands, particularly in the south, is erosion. An Association of Conservational Agriculture has been created in response to this threat with the support of the Higher Technical College of Agricultural Engineering in Cordoba and of several research centres, which are encouraging the development of conservational agriculture. Besides significantly limiting erosion, this production system allows better soil structure and humidity, saving 40% of fuel. No-tillage or minimum-tillage techniques are spreading very quickly in cereal areas, despite the fact that their application requires a certain amount of investment (in new equipment), a training plan for farmers and a minimum range of crops. This system will probably expand over the next few years.

During the last few years an agricultural services market has developed around dry land cereals through the outsourcing of various tasks and, increasingly, farm management. This process is not well reflected in the available statistics and is taking place to a certain extent in the underground economy. This dynamic has generated an important network of agricultural service companies, which are taking care of crops more and more, thus bringing concentration of management that is pushing real production costs down much more than statistics show. Various types of service companies play this role: farming sections of cereals cooperatives, which share equipment managed by cooperatives, companies providing technicians, agrarian equipment or any other inputs, farmers looking after and managing their neighbours' fields, etc... This process will probably speed up

considerably with the new measures, and this could help to prevent farmers from giving up farming in low-yield areas, since economies of scale will be possible.

Crops grown on irrigated land are unlikely to face any particular problems in connection with the with CAP reform. However, the modification foreseen for beet will mean an increase in cereal farming on irrigated land, especially in maize growing, a process that is already taking place in Castile and Leon.

The decrease in the specific subsidy for durum wheat will lead to an increase in the area under strong common wheat, mainly in Andalusia.

## **6     *Cereals and related policies in Turkey*<sup>1</sup>**

### **6.1 – Introduction**

Cereals dominate agricultural production in Turkey due to the semi-arid climatic conditions. Cereals occupied 53% of the area sown and the share of cereals in the value of crop production was 24% in 2003. Wheat is the major crop on both the supply and the demand side as the main staple. The dominance of cereals in supply and demand coupled with the self-sufficiency objective of all governments since the establishment of the Republic has meant that cereals have been a priority in the formulation of agricultural policies.

This study will cover the developments in cereals and related policies in Turkey. The following section presents an overview of the recent policy developments in crop husbandry and cereals. The past trends in the area, production and yields of cereals together with domestic consumption are presented in the third section. The price structure and a comparative analysis of transfers to cereals are provided in the fourth section. The fifth part is about trade in cereals including country-specific exports and imports, and the final section is reserved for concluding comments.

### **6.2 – Agricultural policies and cereals**

During the last decade the agricultural sector in Turkey registered a very low growth rate (0.5%) with wide fluctuations. The historical development of real agricultural value added for the last half century suggests that stagnation in agriculture is not a new phenomenon and appears to be the rule rather than the exception. Growth in real value added in the past has been in upward jumps every 7-9 years. The size of the jumps became smaller over time with fluctuations around the established levels due to weather conditions (Çakmak and Akder, 2005).

Historically, changing policy emphasis in agriculture has contributed to the jumps in agricultural output: increase in area sown in the early 1960s, support for use of chemical fertilisers in the late 1960s, increase in irrigated area and support to mechanisation in the 1970s, support for using high-yield seeds, fallow reduction programmes and new crop rotations in the 1980s have been the major technological and input-augmenting developments contributing to jumps in

---

<sup>1</sup> **Erol H. Çakmak**, Department of Economics, Middle East Technical University, Ankara 06531 (Turkey) [cakmake@metu.edu.tr](mailto:cakmake@metu.edu.tr)

& **H. Ozan Eruygur**, Department of Economics, Middle East Technical University, Ankara 06531 (Turkey) [eruygur@gmail.com](mailto:eruygur@gmail.com)



agricultural output (Çakmak, Kasnakoğlu and Akder, 1999). No significant advance in production was realised in the last decade, so that the stagnation of the previous period continued.

Agricultural growth did not stagnate in all sub-sectors. Cereals and pulses have had a negative impact on the growth of output. The major source of this negative contribution has been the yield decline in wheat in particular. The negative contribution of these major crops has been offset by industrial crops, tuber crops, vegetables and fruit (Akder, Kasnakoğlu and Çakmak, 1999).

After the mid 1980s, Turkey can be considered a perfect example of mismanagement of agricultural policies. The governments were unable to implement any policy to improve productivity in agriculture. A further reason for the preponderance of transfer policies was frequent early elections. The transfers to producers occurred mostly from consumers through support purchases of major crops by the state economic enterprises or sales cooperatives, backed by high tariffs.

The transfers to producers from taxpayers did not reach particularly high levels but were accompanied by huge financial costs. Most of the direct transfers from the State, i.e. compensatory payments, were not budgeted for, and the funds of the State banks were utilised without being paid back in due course. The state economic enterprises (SEEs) in the sector and the Agricultural Sales Cooperative Unions (ASCUs) were another channel which increased the financial costs for the government. The SEEs responsible for implementing agricultural policies (TMO for cereals, Tekel for tobacco, TürkŞeker for sugar, Çaykur for tea) had to borrow at market rates and eventually had to either write off their losses as 'duty losses' or receive capital injections (Kasnakoğlu and Çakmak, 2000). Although not officially considered to be State organisations, the ASCUs were used as policy-implementing agencies of the government with revolving credit lines from the State which are topped up when needed. As the result of these developments combined with over-employment and inefficient management practices, all policy-implementing agencies in the sector became virtually totally dependent on the financial resources of the State.

Turkey embarked on an on-going structural adjustment and stabilisation programme towards the end of 1999; agriculture was selected to undergo heavy adjustment due to ineffective policies and their increasing burden on government finance. Protective trade policies in major crops combined with government procurement, input subsidies, and heavy investment in irrigation infrastructures on a fully subsidised basis had created a net inflow of resources from the government to agriculture, but had had many negative effects on the sector and the economy at large. The benefits of the subsidies were going mainly to larger, wealthier farmers. In addition, the support system failed to enhance productivity growth despite its heavy burden on taxpayers and consumers.

The programme for reforming the agricultural subsidy system had to await the aftermath of another economic crisis in 2001 in order to gain momentum. The reform, known as “Agricultural Reform Implementation Project” (ARIP), focused on three main themes: the first was to phase out the government intervention in the output, credit and fertiliser markets and to introduce direct income support (DIS) for farmers through per hectare payment independent of crop choice. The second theme, closely related to the output price support of the first theme, was to commercialise and privatise state economic enterprises, including TÜRKŞEKER (Turkish Sugar Company) and TEKEL (Turkish Alcohol and Tobacco Company) and to restructure the TMO (Soil Products Office) and the quasi-governmental Agricultural Sales Cooperative Unions (ASCUs), which in the past intervened to support certain commodity prices on behalf of the government. Non-recurrent alternative crop payments formed the third theme. It provided grants to farmers who needed assistance in switching from surplus crops to net imported products. The programme was intended to cover the costs of shifting from producing hazelnuts, tobacco and sugar beet to producing oilseeds, feed crops and maize. Compensatory payments for oilseeds, cotton, olive oil and maize completed the basic policy scene in Turkey.

Participation in alternative crop payments has been limited due to the mixed signals the farmers have been receiving from the government. They were not convinced that the government would continue the on-going support schemes for hazelnuts, sugar and tobacco. Tobacco farmer participation has been extremely high due to the Tobacco Law with which TEKEL ceased to be the price maker on the market, and price formation has been left to the bidding mechanism. The Tobacco and Sugar Laws paved the way for the privatisation of TEKEL and TÜRKŞEKER. Cigarette and alcohol products companies of TEKEL were up for privatisation. The alcohol products company was privatised, but the tender for the cigarette company was cancelled. There has been no serious attempt to privatise in the sugar sector since 2001.

The government has started to restructure ARIP and to add new components. As of 2006, the weight of DIS payments in the total budgetary support to agriculture will be decreased. The per hectare payment will remain constant in nominal terms, but payments will be more targeted. The share of crop-specific compensatory payments, alternative crop grants and support to livestock production will increase slightly. The new items in the short term are related to environmental protection schemes, crop insurance support, and a pilot project on participatory rural development.

Compensatory payments have been made for some deficit products such as cotton, oilseeds, maize and olive oil during the last five years. The government decided to expand the list of crops eligible for compensatory payments by adding cereals in May 2005; cereal farmers will receive about €18 per tonne from the government. There is no indication of whether the compensatory payment is for one single year or for several years to come.

Agenda items of the government's medium-term policy include promotion of a sustainable rural finance system; increased expenditure on rural infrastructures targeting irrigation, storage and marketing facilities and expansion of agricultural extension activities.

The cereals sector was one of the major sub-sectors in agriculture to be affected by the subsidisation reform programme due to the heavy involvement of the government in the output market through the Soil Products Office (TMO), coupled with high tariffs and non-tariff measures. Non-tariff measures consist mainly of the requirement of a control certificate for the import of any cereals to Turkey. In some cases, the right to import may be granted exclusively to the TMO.

To begin with, the reform programme aimed to reduce the volume of the TMO's intervention purchases together with a significant reduction of cereal tariffs. In addition, the procurement prices of cereals (especially wheat) paid by the TMO were linked to the world prices. For instance, the procurement price of wheat in 2000 was 35% higher than the Chicago Board of Trade price. The TMO sales price for grain was set at no less than the lower of either the TMO purchase price plus storage costs incurred up to the date of sale including imputed interest charges on stocks, or the tariff-inclusive import parity price for a cereal of equivalent quality. The discipline in the TMO's procurement policy was impressive in 2000 and 2001. The intervention purchases remained limited due to the overall budgetary discipline which completely eliminated the possibility of financing the intervention from the Treasury. The intervention purchases of cereals by the TMO from 1986 to 2005 are presented in Table 6.1.

The limits on the TMO intervention purchases were effective in 2002 and 2003 but were relaxed in 2004. The quantity bought by the TMO reached high levels as of October 2005. It is estimated that the TMO may be further obliged to buy more maize from farmers at higher prices than border prices for the rest of 2005. The 2005 purchases partly reflect the impact of good climate conditions on production.

**Table 6.1 - Intervention purchases of cereals by the TMO, 1986-2005**

		Wheat	Barley	Maize	Rice	Rye, oats	Total
<b>1986-88</b>	1000 t	3 125	706	62	0	38	3 931
	% of total prod.	16	10	3	0	6	13
<b>1997-99</b>	1000 t	4 306	15 328	511	59	100	6 504
	% of total prod.	22	27	23	32	19	23
<b>2000</b>	1000 t	2 959	509	29	40	0	3 537
	% of total prod.	14	6	1	19	0	11
<b>2001</b>	1000 t	1 459	952	1	20	12	2 444
	% of total prod.	8	13	0	9	2	8
<b>2002</b>	1000 t	333	380	79	59	22	873
	% of total prod.	2	5	4	27	4	3
<b>2003</b>	1000 t	545	27	381	130	6	1 089
	% of total prod.	3	0	14	58	1	4
<b>2004</b>	1000 t	1 872	1	159	2	2	2 036
	% of total prod.	9	0	5	1	0	6
<b>2005</b>	1000 t <sup>a</sup>	4 169	795	203	1	16	5 184
	% of total prod. <sup>b</sup>	20	9	7	0	3	15

Notes: <sup>a</sup> as of mid October 2005; <sup>b</sup> using production levels in 2004.

Sources: TMO (2005), SIS (2005).

As has already been mentioned, the higher internal prices should be supported by the necessary border measures. Turkey applies ad valorem import tariffs for all cereals. The import tariffs following the implementation of the reform programme and the commitments to WTO for 2004 and after are presented in Table 6.2.

**Table 6.2 - Import tariffs on cereals, 2002-05<sup>a</sup> (%)**

HS Code	Commodity	2002	2003	2004	2005	WTO-2004+
100110	Durum wheat	5 (30)	30	30	60 (100)	180
100190	Wheat ex. durum	10 (40)	40	40	85 (130)	180
1002	Rye	60	60	60	60 (130)	180
100390	Barley	85	85	85	85 (100)	180
1004	Oats	30	30	30	30 (60)	180
100590	Maize	10 (35)	35 (70)	80	100 (130)	180
100610	Rice in the husk	27 (38)	38	34	34	45
100630	Rice, milled	35 (46)	45.5	45	45	45

Notes: <sup>a</sup> Numbers in brackets indicate the tariffs in the second half of the year.

Sources: UFT (2005).

The WTO ceiling commitments indicate that Turkey has considered all cereals except rice to be sensitive commodities. The tariff overhang (the difference between ceiling commitments and applied tariff rates) was not used until 2005 and supply management was achieved by the various governments by controlling imports. However, in 2005 there was a clear shift in policy towards increasing the tariffs towards the ceiling commitments in the harvest season. The import regime can be said to have become more WTO-compliant than before.

The reform programme intended to make policies more market-friendly by replacing distorting output market interventions by direct income support. The implementation of the direct income support (DIS) programme started in 2002. The per hectare payment was determined at a rate of about €100 per hectare of cultivated area. The DIS is intended to provide farmers with a safety net following the elimination of the support mechanisms prior to the reform. The DIS is not contingent on input use or farmers' output production decisions and is thus decoupled. The farmers are eligible to receive the fixed amount of payment for up to 50 hectares of cultivated land. The actual DIS payments were delayed for about a year and the payments were made in two instalments. The amount of the payment is reasonable, especially for cereal farmers, and may have helped farmers to make up for the lack of operating capital. Despite the delay, DIS payments amounting to a total of €1.5 billion were made to farmers in 2004 as partial compensation for the removal of the old system and in order to form a dependable basis for the national farmers registry.

### **6.3 – Area, production, yield and consumption**

Field crops have occupied 87% of the cultivated area since 1985 (Table 6.3), and the share of vegetable production has been increasing steadily. Land left to fallow declined from 21% to 19% of cultivated land, causing an increase in cropping intensity of 2 percentage points. The decline in fallow land was sharper following the implementation of the fallow land reduction project in the mid 1980s. The project encouraged planting pulses instead of leaving land to fallow in the customary crop rotation on the Central Anatolian Plateau. However, the decline in the world prices of pulses limited fallow reduction in the last decade.

**Table 6.3 - Use of cultivated area in Turkey**  
**(Averages of the respective periods)**

	<b>1985–87</b>		<b>1995–97</b>		<b>2001–03</b>	
	<i>Area (million ha)</i>	<i>Share (%)</i>	<i>Area (million ha)</i>	<i>Share (%)</i>	<i>Area (million ha)</i>	<i>Share (%)</i>
Field Crops	24.07	87.1	23.62	87.8	22.90	87.0
Area Sown	18.28	66.1	18.57	69.0	17.92	68.1
Fallow	5.79	20.9	5.05	18.8	5.00	18.9
Vegetable	0.64	2.3	0.78	2.9	0.82	3.1
Orchards	2.94	10.6	2.50	9.3	2.60	9.9
<b>Total</b>	<b>27.65</b>	<b>100.0</b>	<b>26.90</b>	<b>100.0</b>	<b>26.31</b>	<b>100.0</b>

Sources: SIS (2003), (2005).

The field crop pattern showed no drastic changes, apart from the increase in cereals and a steady decline in the share of oilseeds (Table 6.4).

**Table 6.4 - Field crop areas in Turkey**  
**(averages of the respective periods)**

<i>Crop</i>	<b>1985–87</b>		<b>1995–97</b>		<b>2001–03</b>	
	<i>Area (million ha)</i>	<i>Share (%)</i>	<i>Area (million ha)</i>	<i>Share (%)</i>	<i>Area (million ha)</i>	<i>Share (%)</i>
Cereals	13.82	50.0	13.85	50.4	13.70	52.1
Wheat	9.37	33.9	9.36	34.1	9.25	35.2
Barley	3.34	12.1	3.61	13.1	3.55	13.5
Maize	0.57	2.0	0.54	2.0	0.54	2.0
Rice	0.06	0.2	0.05	0.2	0.06	0.2
Pulses	1.74	6.3	1.83	6.7	1.56	5.9
Industrial crops	1.24	4.5	1.48	5.4	1.36	5.2
Oilseeds	0.93	3.4	0.72	2.6	0.64	2.4
Tuber crops	0.29	1.0	0.34	1.2	0.30	1.1
<b>Total cultivated area</b>	<b>27.65</b>	<b>65.2</b>	<b>26.90</b>	<b>66.3</b>	<b>26.37</b>	<b>66.7</b>

Sources: SIS (1989), (1999), (2003), (2005).

### **6.3.1 - Trends in area under cereals, production and yields**

The area under cereals and its share in the arable and arable plus permanent crop land in the last four decades are presented in Table 6.5. The period covered is divided into four parts in order to show periodic changes. The figures are reported without any aggregation in order to show product-specific distribution details.

The shares of area under cereals in both arable and arable plus permanent crop land increased during the period. The total area under cereals went up by 6.9% from period 1 to period 4. The increase in arable land is 4.6% between the same periods, which would point to a substitution towards cereal area within the use of total arable land. Notice also that the share of cereals within arable lands increased about 3.7 percentage points between the first and last periods. This 3.7 point increase corresponds to an area of 0.9 million hectares, which is quite considerable.

**Table 6.5 - Areas and shares by cereal product (period averages)**

	1961-1970			1971-1980		
	Area	Share of arable land	Share of arable + perm. crop land	Area	Share of arable land	Share of arable + perm. crop land
	<i>Million ha</i>	%	%	<i>Million ha</i>	%	%
Wheat	8.156	34.0	31.0	9.035	37.7	34.3
Barley	2.734	11.4	10.4	2.601	10.9	9.9
Maize	0.666	2.8	2.5	0.599	2.5	2.3
Rice, paddy	0.057	0.2	0.2	0.060	0.2	0.2
Rye	0.693	2.9	2.6	0.548	2.3	2.1
Oats	0.386	1.6	1.5	0.253	1.1	1.0
Millet	0.044	0.2	0.2	0.026	0.1	0.1
Canary seed	0.011	0.0	0.0	0.002	0.0	0.0
Mixed Grain	0.284	1.2	1.1	0.192	0.8	0.7
CEREALS	13.032	54.4	49.5	13.315	55.6	50.6
ARABLE LAND (1)	23.966	100.0	91.0	25.234	100.0	89.9
ARABLE+PERM. (2)	26.323		100.0	28.067		100.0
	1981-1990			1991-2002		
	Area	Share of arable land	Share of arable + perm. crop land	Area	Share of arable land	Share of arable + perm. crop land
	<i>Million ha</i>	%	%	<i>Million ha</i>	%	%
Wheat	9.255	38.6	35.2	9.459	39.5	35.9
Barley	3.228	13.5	12.3	3.578	14.9	13.6
Maize	0.548	2.3	2.1	0.530	2.2	2.0
Rice, paddy	0.062	0.3	0.2	0.053	0.2	0.2
Rye	0.246	1.0	0.9	0.146	0.6	0.6
Oats	0.163	0.7	0.6	0.148	0.6	0.6
Millet	0.008	0.0	0.0	0.003	0.0	0.0
Canary seed	0.000	0.0	0.0	0.000	0.0	0.0
Mixed grain	0.066	0.3	0.3	0.015	0.1	0.1
CEREALS	13.576	56.6	51.6	13.931	58.1	52.9
ARABLE LAND (1)	24.631	100.0	89.3	25.074	100.0	90.3
ARABLE+PERM. (2)	27.591		100.0	27.775		100.0

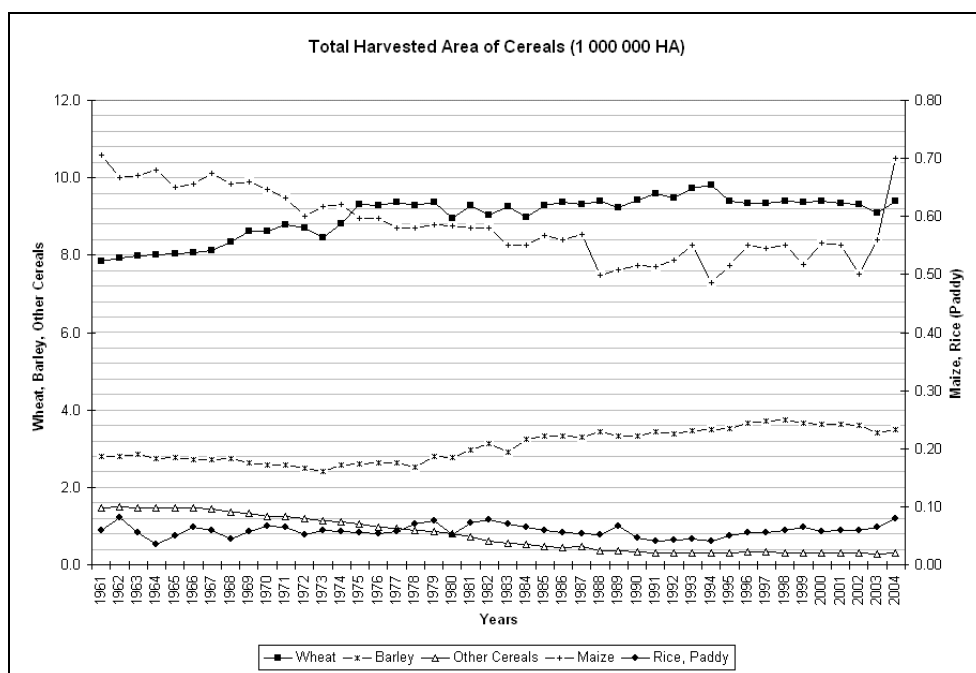
Source: FAOSTAT, 2005a.

Another important observation is that only wheat and barley increased their shares of the total area under cereals, by 5.5 and 3.5 percentage points respectively. Except

for rice, the shares of all other cereals decreased: Table 6.5 shows a 0.6% decrease for maize, a 2.3% decrease for rye, a 1% decrease for oats, a 0.2% decrease for millet and a 1.1% decrease for mixed grain.

The most important cereal produced is wheat with an area of about 9.6 million hectares (Figure 6.1) and an output of 21 million tonnes (Figure 6.2) in 2004. Between 1961 and 2004, one observes a gradual upward trend in the area under wheat (Figure 6.1). In terms of output, a threefold increase in wheat production can be observed between 1961 and 2004 (Figure 6.2).

**Figure 6.1 - Total harvested area of cereals (million ha)**



Note: the “Cereal” aggregate represents the sum of wheat, rice (paddy), barley, maize, rye, oats, millet, canary seed, and mixed grain products.

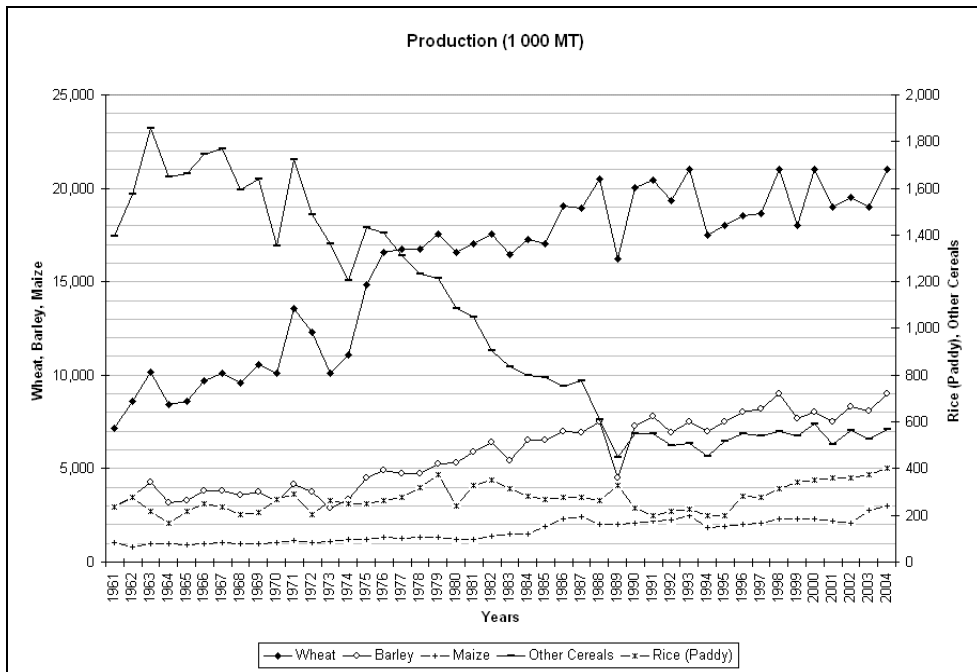
Source: FAOSTAT, 2005a.

The significant difference between the growth rate of the area under wheat and wheat output indicates an important upward trend in wheat yield; the average yield was about 1 tonne per hectare in 1961 and increased to about 2.2 tonnes per hectare in 2004. The wheat yield went up by about 220% from 1961 to 2004.



The period under review is divided into sub-periods to obtain a better picture of the yield developments. The sub-periods are determined according to the departures from the trend values. Annual growth rates for the three periods studied are given in Table 6.6. Note that different sub-periods are determined for each cereal product. Table 6.6 contains trend calculations.

**Figure 6.2 - Cereal product output (1 000 metric tonnes)**



Source: FAOSTAT, 2005a.

Trends are estimated log-linear growth rates according to equation 1) below. They are calculated by running log-linear regressions, where  $y$  denotes *yield*,  $t$  denotes *year*,  $\beta_0$  is the *intercept*,  $\beta_1$  the *regression coefficient* and  $u$  the *disturbance term*. The estimated regression coefficients report growth rates. Annual growth rates are reported as percentages in Table 6.6.

$$1) \quad y = \beta_0 e^{\beta_1 t} + u$$

Wheat yield growth rates reveal that the highest rate is observed in the first period (1961-1974). Wheat yields increased by about 2% per annum from 1961 to 1974, 1.2% per annum from 1975 to 1993, and 1.5% per annum thereafter. The coefficients of variation for annual wheat yields show that the yield volatility is

highest in the first period and lowest in the last period (Table 6.6). The average yearly increase over the entire period was only 1.8% per annum. Different growth accounting can be done by comparing the average yields of the sub-periods. Almost all of the increase from the first to the last period (71%) resulted from the increase from the first to the second period (60%). The drastic increase in the yields in the first period reflects the impact of the “green revolution” on wheat production in Turkey.

Barley is the second most important cereal with an area of 3.6 million hectares and an output of about 9 million tonnes. The barley area was 2.8 million hectares in 1961 and it increased by about 30% during the period studied. A similar trend was observed for wheat. However, the increase in output is impressive with a threefold increase in the period from 1961 and 2004 (from 3 million metric tonnes to 9 million metric tonnes). Again, the marked difference between the growth rates of harvested area and output implies considerable improvement in the country average barley yields during the period under review. The country average barley yield was about 1 tonne per hectare in 1961; however, it was about 2.6 tonnes per hectare in 2004, which meant a 2.6-fold increase in the country average barley yield (Figure 6.3). The trend-based yield growth estimates reported in Table 6.6 indicate a statistically significant annual growth of 1.6% for barley from 1961 to 2004. Regarding the sub-periods, barley yields achieved a statistically significant annual growth rate of about 2% from 1961 to 1976, 1.4% from 1977 to 1988, and 1.7% from 1989 onwards until 2004. The yield volatility that can be captured to some extent by a coefficient of variation is highest in the first period, falls in the second period and then increases again in the last period compared to the second period. With regard to the growth rate of yields between the sub-period average yields, one can see that there is an increase of some 43% in period-specific yields between period 1 and 2, and an increase of only about 9% from period 2 to period 3. From period 1 to period 3, the average barley yield per period increased by about 56%.

Table 6.6 - Yields of selected cereals, 1961-2004

	2002-2004	1961-2004		PERIOD I			PERIOD II		
	Yield	Annual Growth	CV	Yield	Annual Growth	CV	Yield	Annual Growth	CV
	t/ha	%	%	t/ha	%	%	t/ha	%	%
Wheat	2.140	1.76 [0.00]	23.0	1.200	2.05 [0.01]	13.0	1.919	1.19 [0.00]	8.5
Barley	2.420	1.62 [0.00]	22.2	1.384	1.97 [0.01]	15.6	1.977	1.35 [0.00]	5.7
Maize	4.495	3.26 [0.00]	41.1	1.572	2.50 [0.01]	11.8	3.138	5.19 [0.00]	30.6
Rice	5.574	0.80 [0.00]	12.9	4.245	1.11 [0.01]	9.7	4.807	0.80 [0.03]	5.8
Other	1.597	0.99 [0.00]	13.6	1.150	1.20 [0.01]	7.3	1.468	0.60 [0.04]	6.0

	2002-2004	PERIOD III			GROWTH FROM		
	Yield	Yield	Annual Growth	CV	1 to 3	1 to 2	2 to 3
	t/ha	t/ha	%	%	%	%	%
Wheat	2.140	2.048	1.52 [0.02]	7.2	70.69	59.96	6.71
Barley	2.420	2.162	1.73 [0.02]	12.1	56.21	42.83	9.37
Maize	4.495	4.109	2.11 [0.01]	9.5	161.40	99.63	30.94
Rice	5.574	5.283	1.95 [0.04]	11.4	24.47	13.23	9.92
Other	1.597	1.555	0.90 [0.01]	4.8	35.23	27.70	5.90

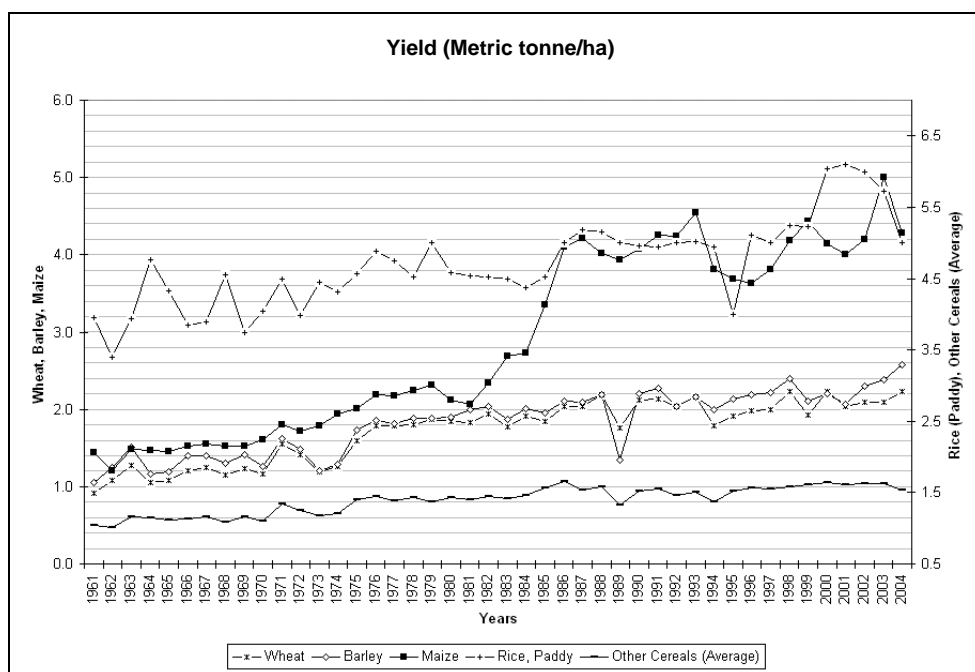
Notes:

- (1) Definition of periods for wheat, barley, maize, rice and other cereals are as follows:  
Wheat: period I: 1961-1974; period II: 1975-1993; period III: 1994-2004,  
Barley: period I: 1961-1976; period II: 1977-1988; period III: 1989-2004,  
Maize: period I: 1961-1974; period II: 1975-1993; period III: 1994-2004,  
Rice: period I: 1961-1978; period II: 1979-1992; period III: 1993-2004,  
Other Cereals (Average): period I: 1961-1974; period II: 1975-1991; period III: 1992-2004.
- (2) The annual growth rates have been estimated as log-linear trends by ordinary least squares regression.
- (3) The figures in brackets below the annual growth estimates are the associated probability values, i.e., they represent the statistical level of significance of annual growth rate estimates.
- (4) The CV column represents the *coefficients of variation* for the annual yields, defined as standard deviation divided by mean. Note that CV measures the variation in annual yields relative to the value of the period mean.

Source: FAOSTAT, 2005a.

We see in Figure 6.1 that the “other cereals” aggregate which we calculated as the sum of rye, oats, millet, canary seed and mixed grain is the third most important cereal in terms of total harvested area. The total harvested area of “other cereals” was about 1.5 million hectares (Figure 6.1) in 1961 dropping drastically to about 0.4 million hectares in 2004. Between 1961 and 2004, there was a steady downward trend in the harvested area of the “other cereals” aggregate. A similar downward trend can be seen in the total output of “other cereals”; output was about 1.4 million tonnes in 1961 but dropped to about 0.6 million tonnes in 2004.

**Figure 6.3 - Cereal yields (1961-2004)**



Source: FAOSTAT, 2005a.

On the other hand, although there are important drops in both harvested areas and production quantities, there was an increase in the average yields of the “other cereals” composite product from about 1 tonne per hectare in 1961 to 1.5 tonnes per hectare in 2004. In other words, there was a 1.5-fold increase in the average yield of “other cereals” between 1961 and 2004. In terms of trend-based estimates for sub-periods, country average yields of the “other cereals” aggregate registered a statistically significant growth rate of about 1.2% per annum from 1961 to 1974, 0.6% per annum from 1975 to 1991 and 0.9% per annum from 1992 to 2004. With regard to the trend-based estimates for the entire period from 1961 to 2004, a statistically significant growth rate of about 1% per annum is estimated for the

yields of the “other cereals” aggregate. Relatively low CV (coefficient of variation) values for “other cereals” indicate low variations from one year to the next in the country average yields.

The fourth important cereal in terms of total harvested area is maize with an area of some 0.7 million hectares (Figure 6.1, 2004) and an output of 3 million tonnes (Figure 6.2, 2004). Although there are no significant differences in the total harvested maize areas of 1961 and 2004, the period between these two years first saw a considerable decrease in area with few variations until 1994, then a relatively steady period between 1995 and 2002 and lastly an impressive upward trend in 2003 and 2004. As regards maize output, following a virtually constant period from 1961 to 1974, a slight upward trend is observed from 1975 to 1985. A relatively high and volatile increase occurred after 1985 until 2004. The 1975-1994 period shows a steady decrease in maize area and a continuing increase (sometimes slight, sometimes relatively high) in maize output. Both of these developments together indicate a period (between 1975 and 1994) of increasing production quantities with decreasing production areas. Obviously, this can only happen as the result of high increases in yields. Indeed, the annual growth rate estimates (Table 6.6) reveal this fact for that period. During the 1975-1993 period, the 5.2% annual growth rate for yield is statistically significant. The first and last periods also registered yield increases. In the first period (1961-1974), maize yield increased by 2.5% per annum while in the last period (1994-2004) it increased by 2.1% per annum. The annual growth rate of the last period is lower than the first period since the last period has been accompanied by increasing production areas. During the whole period from 1961 to 2004, the maize yield increased by about 3.3% per annum. An increase of approximately 100% was recorded from period 1 to period 2 and 30% from period 2 to period 3. From period 1 to period 3, an impressive growth rate of about 161% was recorded.

The relatively high CV (coefficient of variation) values indicate a higher volatility in maize yield compared to other cereal products. The CV value of maize yields is highest for the second period, which is also the time span with the highest annual growth rates. This implies sharp changes and variations for this impressive period.

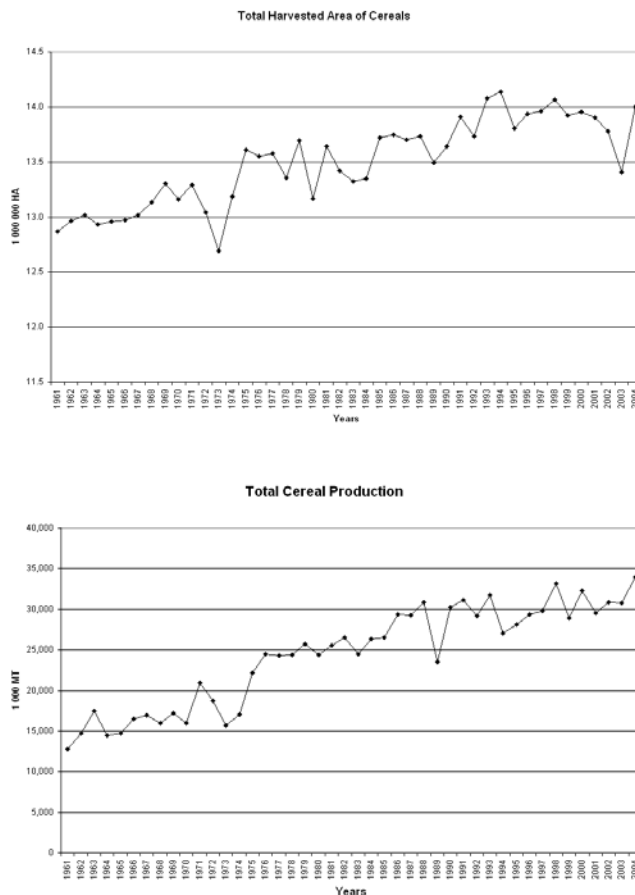
The development in the production and yield of maize is a perfect example of the technological changes on the supply side. In the 1960s and 1970s, maize was produced basically for home consumption and its use for commercial feed was limited. Access to hybrid and composite seed varieties through a project supported by CIMMYT (International Maize and Wheat Improvement Center) at the beginning of the 1980s increased the yield, hence the increase in output without any significant expansion in area. The market for maize developed further towards the end of the 1990s with the domestic production of high-fructose corn syrup (known as isoglucose in the EU).

The last major cereal product is (paddy) rice with an area of 0.09 million hectares (Figure 6.1) and an output of 0.4 million tonnes per year (Figure 6.2) in 2004. We

can see from Figure 6.1 and 6.2 that the harvested (paddy) rice area was about 0.06 million hectares and the output was about 0.25 million tonnes in 1961. The harvested area increased to about 0.09 million hectares and output increased to about 0.4 million tonnes in 2004. We observe a relatively stationary period for (paddy) rice production between 1961 and 1993; however, a strong upward trend can be seen after 1993. This situation is also revealed in the relatively high annual growth rate estimates for the period from 1993 to 2004 (Table 6.6). This last period registered an annual growth rate of about 2% per annum, although the annual growth rate for the first and second periods (1961-1978 and 1979-1992) was 1.1% and 0.8% respectively. Again, without separating the periods, if we look at the entire period, estimation results point to a statistically significant annual growth rate of about 0.8%. Note, however, that period-based analysis is important since it allows us to determine the changing structure in rice yields for the period from 1993 to 2004.

The trends regarding the total harvested cereal area and total cereal output over the past 40 years are presented in Figures 6.4A and 6.4B. In 1961, the total cereal area was about 12.8 million hectares while in 2004 this figure increased to about 14 million hectares. The pattern is similar in terms of total cereal production, which increased from 12.5 million tonnes in 1961 to about 34 million tonnes in 2004.

**Figure 6.4A, 6.4B - Total harvested areas and cereal product outputs (1961-2004)**



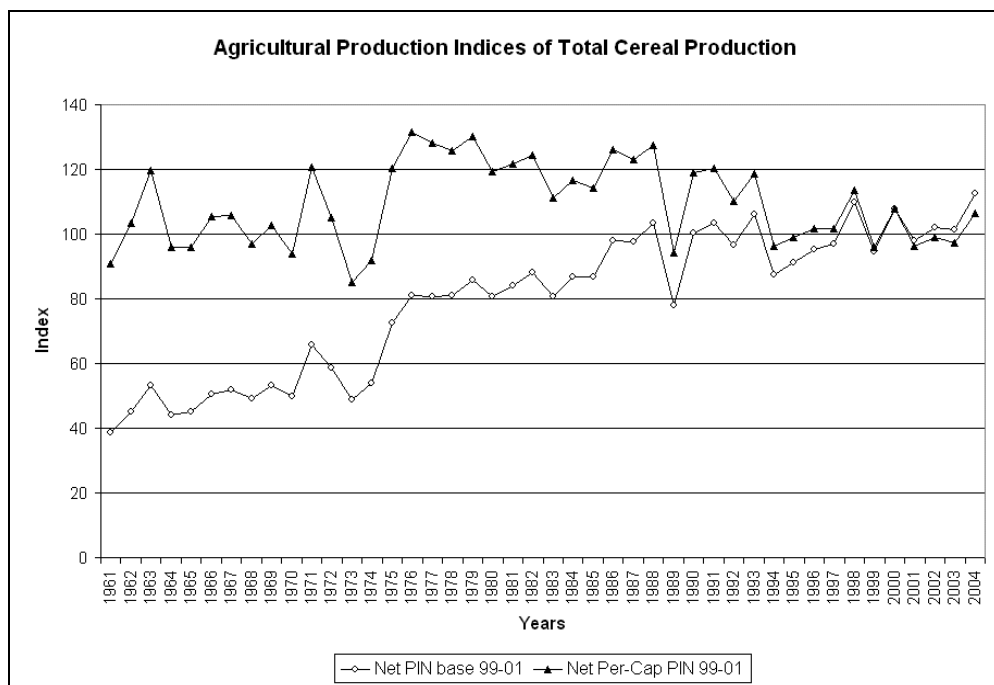
Note: The “Cereal” aggregate represents the sum of wheat, rice (paddy), barley, maize, rye, oats, millet, canary seed, and mixed grain products.

Source: FAOSTAT, 2005a.

This behaviour in total cereal production can also be observed in the FAO agricultural production indices (Figure 6.5). However, the FAO per capita production index reveals that there is not much change in total agricultural production in per capita terms. The per capita production index oscillates between the values of 130 and 90. Another interesting finding is that the 1963 total per capita cereal production index value is about 8% higher than that of 2004. The per capita index value shows different behaviour for the years from 1975 to 1988; for this period the index oscillates around the value of 120. Accordingly, for the same

period, the increase in the total production index seems to be relatively high compared to the time span before and after this period.

**Figure 6.5 - Total cereal production indices (1961-2004)**



The indices presented here are only “net” FAOSTAT indices, total (Net Pin base 99-01) and per capita (Net Per-Cap PIN 99-01), i.e. those based on production minus the amounts used for feed and seed.

Source: FAOSTAT data, 2005.

Table 6.7 gives two different cereal yield forecasts for 2010 and 2015. The first column of the table reports the 2004 cereal yield levels. The Projection 1 forecasts given in the third and fourth columns are obtained from the OLS estimation of equation 1) using the corresponding last periods (period III definitions can be found in Note 1 just below Table 6.6). The Projection 2 forecasts given in the fifth and last columns are obtained from the OLS estimation of the same equation, but this time using the whole sample (1961-2004). In our opinion, although the sample size is smaller, Projection 1 is more realistic, since it takes only the last period into account. It can be seen in Table 6.7 that, with the exception of (paddy) rice, Projection 1 forecasts are relatively low compared to those of Projection 2, since in the last few years Turkey’s performance in increasing cereal yields has not been particularly good. However, if Turkey could perform in the future as well as it did in



the 1960s, 1970s and early 1980s, Projection 2 forecasts could also be obtained. Note that, for the time being, this is fairly unlikely.

**Table 6.7 – Yield projections for cereal products**

	Actual yield (tonnes/ha)	Projection 1: from Period III		Projection 2: from 1961-2004	
	<b>2004</b>	<b>2010</b>	<b>2015</b>	<b>2010</b>	<b>2015</b>
<b>Wheat</b>	2.23	2.41	2.60	2.71	2.96
<b>Barley</b>	2.57	2.71	2.95	2.78	3.02
<b>Maize</b>	4.29	5.16	5.73	6.45	7.59
<b>Rice</b>	5.00	6.57	7.24	5.82	6.06
<b>Other cereals</b>	1.53	1.73	1.81	1.81	1.90

Source: FAOSTAT, 2005a and authors' own calculations.

### **6.3.2 - Regional specialisation and differences**

The regional specialisations and differences for cereal production in Turkey are presented using NUTS-1 regional definitions. Table 6.8 reports the regional data for wheat, barley, maize, (paddy) rice, and the “other cereals” composite product.

**Table 6.8 - Distribution of cereal harvested areas, production and yields (2002)**

NUTS1 <sup>a</sup>	Wheat			Barley			Maize		
	Area (ha)	Prod. (tonnes)	Yield (t/ha)	Area (ha)	Prod. (tonnes)	Yield (t/ha)	Area (ha)	Prod. (tonnes)	Yield (t/ha)
<b>TR1</b>	40 537	132 398	3.266	10 383	35 742	3.442	851	2 116	2.486
<b>TR2</b>	797 659	2 181 858	2.735	97 513	296 605	3.042	12 307	62 099	5.046
<b>TR3</b>	739 869	1 663 290	2.248	409 183	1 086 328	2.655	52 945	268 737	5.076
<b>TR4</b>	453 043	1 066 227	2.353	180 280	458 527	2.543	77 034	424 097	5.505
<b>TR5</b>	1 343 619	2 795 112	2.080	703 934	1 666 664	2.368	6 849	45 211	6.601
<b>TR6</b>	1 063 673	2 856 323	2.685	185 836	530 030	2.852	202 821	1 384 942	6.828
<b>TR7</b>	1 439 388	2 353 848	1.635	517 941	1 180 897	2.280	3 523	20 475	5.812
<b>TR8</b>	916 678	1 721 507	1.878	226 527	480 938	2.123	98 268	268 653	2.734
<b>TR9</b>	55 412	75 484	1.362	29 162	52 906	1.814	78 742	160 687	2.041
<b>TRA</b>	517 593	642 374	1.241	301 813	466 641	1.546	789	2 295	2.909
<b>TRB</b>	556 687	703 916	1.264	132 108	235 196	1.780	5 699	42 640	7.482
<b>TRC</b>	1 175 842	2 807 663	2.388	605 320	1 609 526	2.659	20 172	118 048	5.852
<b>Turkey</b>	9 100 000	19 000 000	2.088	3 400 000	8 100 000	2.382	560 000	2 800 000	5.000

**Table 6.8 (contd.)**

	Rice			Other cereals			Total cereals		
	Area	Prod.	Yield	Area	Prod.	Yield	Area	Prod.	Yield
NUTS1 <sup>a</sup>	(ha)	(tonnes)	(t/ha)	(ha)	(tonnes)	(t/ha)	(ha)	(tonnes)	(t/ha)
TR1	331	1 098	3.317	5 810	15 355	2.643	57 912	186 709	3.224
TR2	37 039	126 970	3.428	25 617	62 339	2.434	970 135	2 729 871	2.814
TR3	0	0	0.000	13 981	25 991	1.859	1 215 978	3 044 346	2.504
TR4	1 078	3 682	3.416	38 064	82 639	2.171	749 499	2 035 172	2.715
TR5	189	606	3.206	61 570	106 815	1.735	2 116 161	4 614 408	2.181
TR6	1 543	2 511	1.627	13 526	27 489	2.032	1 467 399	4 801 295	3.272
TR7	19	52	2.737	75 822	138 430	1.826	2 036 693	3 693 702	1.814
TR8	22 202	83 921	3.780	24 313	33 857	1.393	1 287 988	2 588 876	2.010
TR9	137	336	2.453	7 154	9 272	1.296	170 607	298 685	1.751
TRA	27	24	0.889	19 664	29 338	1.492	839 886	1 140 672	1.358
TRB	352	639	1.815	1 681	2 196	1.306	696 527	984 587	1.414
TRC	2 083	3 361	1.614	1 398	1 079	0.772	1 804 815	4 539 677	2.515
Turkey	65 000	223 200	3.434	288 600	534 800	1.853	13 413 600	30 658 000	2.286

<sup>a</sup> TR1 region is Istanbul. Agricultural production in Istanbul is negligible. Istanbul is included in the total in both this and the following tables.

Source: SIS, 2005.

### *Wheat:*

Wheat production is concentrated in the TR6 (Mediterranean), TRC (South-East Anatolia), TR5 (West Anatolia), TR7 (Central Anatolia) and TR2 (West Marmara) regions with production shares of 15.0, 14.8, 14.7, 12.4 and 11.5% respectively (Table 6.9). The highest yield, 2.74 tonnes per hectare, was achieved in the TR2 (West Marmara) region. The Eastern Black Sea region, denoted by TR9, has the lowest share in total wheat production with 0.4%. The lowest yields are observed in TRA North-East Anatolia), TRB (East-Central Anatolia) and TR9 (Eastern Black Sea) regions ranging from 1.24 tonnes per hectare to 1.36 tonnes per hectare. For the sake of comparison, note that Turkey's average wheat yield is about 2 tonnes per hectare (Figure 6.3).

Central Anatolia has the highest wheat area with 1.44 million hectares, followed by West Anatolia (1.34 million hectares) and the South-East Anatolia Region (1.18 million hectares).

### *Barley:*

Regarding barley production, Table 6.8 reports that barley production is basically concentrated in the TR5 (West Anatolia), TRC (South-East Anatolia), TR7 (Central Anatolia) and TR3 (Aegean) regions with production shares of 20.6%, 19.9%, 14.6% and 13.6% respectively. The regions with highest barley yields are TR2 (West Marmara), TR6 (Mediterranean), TRC (South-East Anatolia) and TR3 (Aegean) with 3.04, 2.86, 2.66, and 2.66 tonnes per hectare respectively. The lowest barley yields are observed basically in the TRA (North-East Anatolia) region with 1.55 and in the TRB (East-Central Anatolia) region with 1.78 tonnes per hectare. For

comparison, note here that Turkey's average barley yield is approximately 2.4 tonnes per hectare (Figure 6.3).

In terms of harvested barley area, the leading region is TR5 (West Anatolia) with 0.7 million hectares, followed by South-East Anatolia with 0.6 million hectares, and the last region with an area of over 0.5 million hectares is Central Anatolia with 0.52 million hectares.

**Table 6.9 - Regional shares (%) in production (2003)**

NUTS1	Shares (%)					
	Wheat	Barley	Maize	Rice	Other cereals	Total cereals
TR1	0.7	0.4	0.1	0.5	2.9	<b>0.6</b>
TR2	11.5	3.7	2.2	56.9	11.7	<b>8.9</b>
TR3	8.8	13.4	9.6	0.0	4.9	<b>9.9</b>
TR4	5.6	5.7	15.1	1.6	15.5	<b>6.6</b>
TR5	14.7	20.6	1.6	0.3	20.0	<b>15.1</b>
TR6	15.0	6.5	49.5	1.1	5.1	<b>15.7</b>
TR7	12.4	14.6	0.7	0.0	25.9	<b>12.0</b>
TR8	9.1	5.9	9.6	37.6	6.3	<b>8.4</b>
TR9	0.4	0.7	5.7	0.2	1.7	<b>1.0</b>
TRA	3.4	5.8	0.1	0.0	5.5	<b>3.7</b>
TRB	3.7	2.9	1.5	0.3	0.4	<b>3.2</b>
TRC	14.8	19.9	4.2	1.5	0.2	<b>14.8</b>
<b>Turkey</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Source: SIS, 2005.

#### *Maize:*

As for maize, the main production region is clearly TR6 (Mediterranean) with a production share of about 49.5%, followed by TR4 (East Marmara), which is the second main producer of maize, supplying 15.1% of total Turkish maize production. The TR3 (Aegean) and TR8 (Western Black Sea) regions can be defined as two medium producers with equal production shares of 9.6%.

With regard to yields, the highest maize yield is observed in TRB (East-Central Anatolia) with 7.48 tonnes per hectare; note, however, that this high figure could result from the region's low production level accounting for only 1.5% of total Turkish maize production. The second highest yield is observed in the TR6 (Mediterranean) region with 6.83 tonnes per hectare in addition to its leadership in maize production, supplying half of Turkey's total output. It must be noted that maize in the Mediterranean Region is produced under irrigated conditions, mostly as a second crop following wheat. For comparison, note that Turkey's average maize yield is 5 tonnes per hectare. With regard to total area, the Mediterranean region is again the leader with 0.2 million hectares accounting for 36% of the total harvested maize area in Turkey. We must thus point out that the Mediterranean region is clearly the leader in terms of area, production and yield.

*Rice:*

As with maize production, rice production is concentrated in two regions, namely TR2 (West Marmara) with a production share of 57% and TR8 (Western Black Sea) supplying 38% of Turkey's total rice production. These two regions together produce about 95% of total rice output. Quite impressively, the highest yields are also observed in these regions. The Western Black Sea region, denoted by TR8 in Table 6.8, produces a yield of 3.8 tonnes per hectare and the TR2 (West Marmara) region's average yield is recorded as 3.4 tonnes per hectare. For comparison, note that Turkey's average rice yield is about 3.4 tonnes per hectare.

*Other Cereals:*

The regional data for the "other cereals" aggregate consisting of spelt, rye, oats, mixed grain, millet and canary seed are presented in Table 6.8. The Central Anatolia Region (TR7) has the highest production with 138 430 tonnes. Further details on the components of "other cereals" can be found in the Tables from A6.1 to A6.6 in the Appendix.

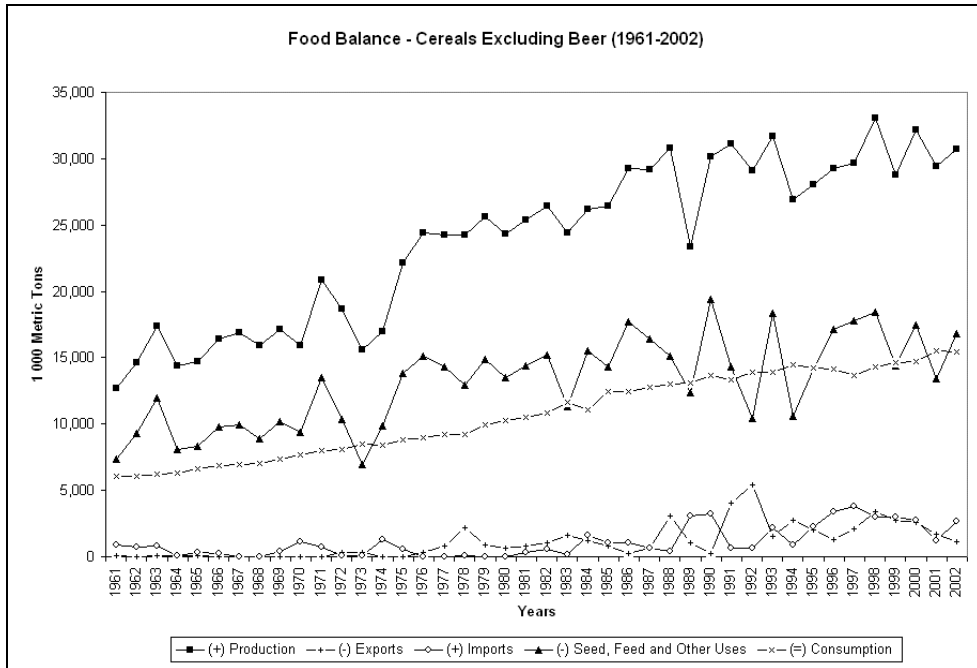
*Total Cereals:*

If we analyse the production of the total cereals aggregate according to regional distribution we see that the TR6 (Mediterranean) region supplies 15.7% of total production with the highest average yield of about 3.27 tonnes per hectare (Table 6.8). TR5 (West Anatolia) produces 15.1% of the total cereal output with an average yield of about 2.18 tonnes per hectare. South-East Anatolia comes third in rank in terms of production level with a share of 14.8 %, and TR7 (Central Anatolia) comes fourth in production with a share of 12.0%.

### **6.3.3 – Consumption**

Figure 6.6 reports the food balance for cereals excluding beer for Turkey from 1961 to 2002. The food balance is, in fact, simply the result of the following equation:

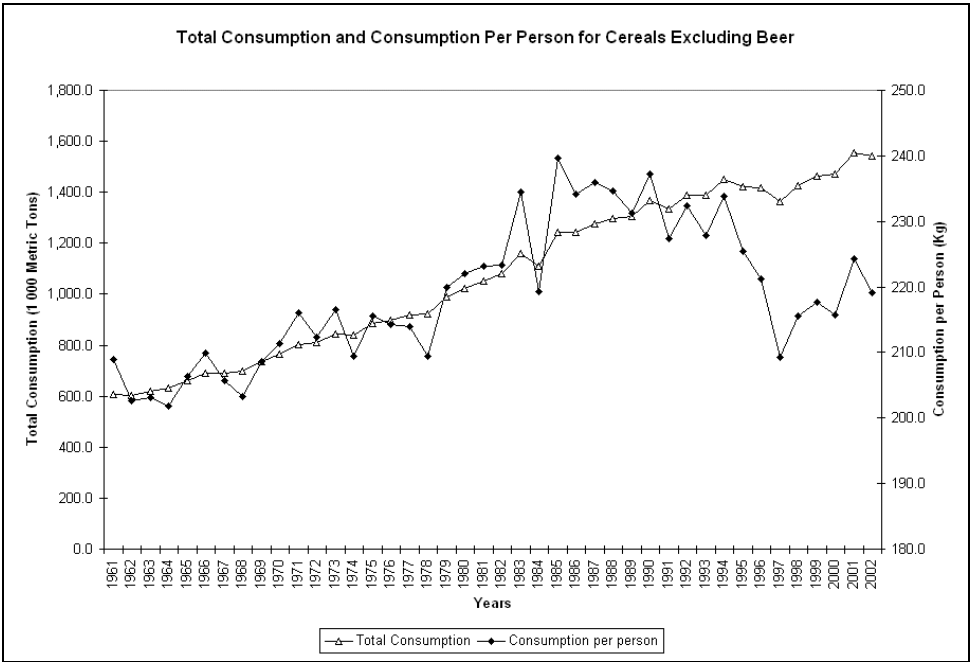
$$(2) \quad \text{Production} - \text{Export} + \text{Import} - \text{Seed, Feed and Other Uses} = \text{Consumption}$$

**Figure 6.6 - Food balance for cereals excluding beer (1961-2002)**

Source: FAOSTAT, 2005a.

In the above figure we see the behavioural pattern of Turkish cereal consumption over the past 40 years. The upward trend in total consumption is clear from the graph. However, it can be misleading to look only at total figures since in this case we do not take into account the population increase over the past 40 years. Indeed, if we plot the total cereal consumption and cereal consumption per person together we see that the consumption per person has not followed the same behavioural pattern as total consumption. Quite the contrary, after 1985 we observe that there is a decrease in total cereal consumption per person, although the variation from year to year is quite high.

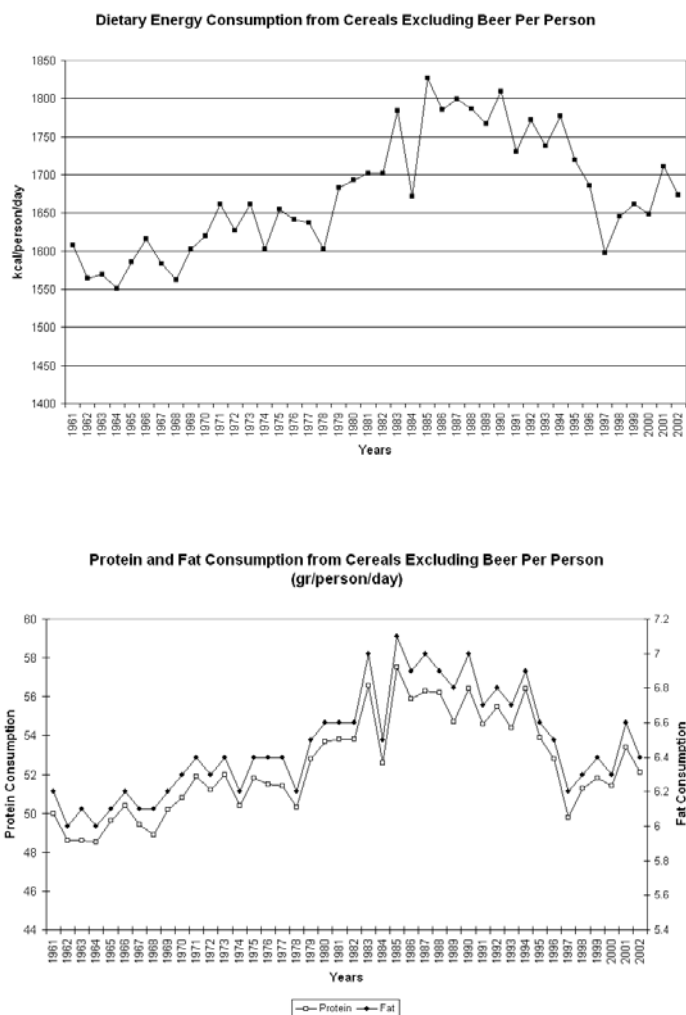
**Figure 6.7 - Total cereal consumption and consumption per caput (1961-2002)**



Source: FAOSTAT, 2005a.

The increasing pattern of consumption per person until 1986 and then the downward trend with wide variations after 1986 can also be seen from the data on per capita dietary energy consumption from cereals presented in Figure 6.8A and from the data on per capita protein and fat consumption (from cereals) plotted in Figure 6.8B.

**Figure 6.8A, 6.8B - Per capita dietary energy consumption from cereals, and protein and fat consumption from cereals**



Source: FAOSTAT, 2005a.

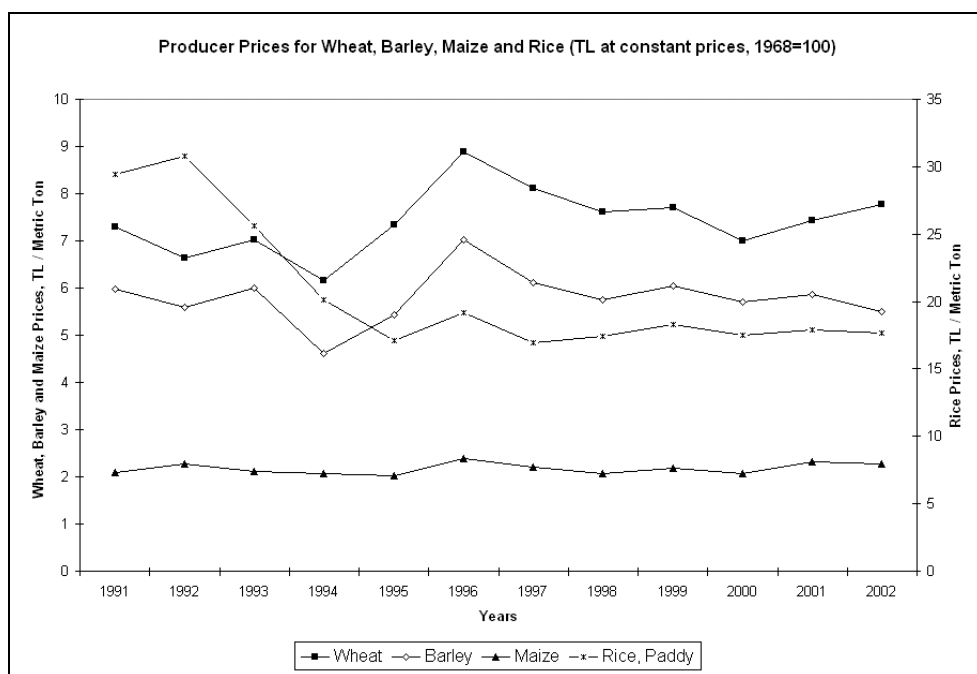
## 6.4 – Prices and comparative support to cereals

### 6.4.1 - Development in prices and relative price structure

Figure 6.9 and Table 6.10 report the producer prices for wheat, barley, maize and (paddy) rice at constant TL prices (1968=100) and in US\$, respectively.

With the exception of rice, the real producer prices of the major cereals do not exhibit any drastic changes. As is indicated in the second section, the WTO ceiling commitment and the applied tariff on rice is rather low compared to other cereals. The producer price of rice displayed a drop of almost 40% with the implementation of the WTO Agreement on Agriculture.

**Figure 6.9 – Producer prices for cereals (TL at constant prices)**



Source: FAOSTAT, 2005a.

Wheat and barley prices moved together and the maize price was stable during the period under review. The fluctuations in real prices and in US dollars are similar except in the crisis years in 1994 and 2001, where the dollar prices registered significant drops.



**Table 6.10 - Producer prices for cereals (\$/metric tonne)**

Years	Wheat	Barley	Maize	Rice, paddy
1991	163	133	164	657
1992	167	140	200	771
1993	180	153	190	655
1994	132	99	156	432
1995	190	141	183	444
1996	224	177	209	483
1997	202	152	192	421
1998	193	146	184	442
1999	170	134	169	405
2000	159	130	164	398
2001	126	100	137	304
2002	164	116	167	371

Source: FAOSTAT, 2005a.

As will be explained below, almost all cereal price support is achieved through border measures, which are generally accompanied by intervention purchases by the government.

#### **6.4.2 - Transfers to agriculture and cereals**

The contribution of agricultural policies to farmers' incomes increased almost threefold, from US\$3.4 billion to US\$11.6 billion from the late 1980s to 2004 (Table 6.11). The general effects of the ARIP are noticed with a significant decline in support to agriculture in 2001. State intervention in the output markets was severely restricted in 2001, and the implementation of direct income support was delayed. The domestic market has been adjusting fast. The market price support provided by the border measures picked up again in 2002 with significant increase in intervention purchases in 2003 and 2004.

**Table 6.11 - Producer support and transfer to agriculture in Turkey (million US\$)**

	1986-89	1996-99	2000	2001	2002	2003	2004 <sup>e</sup>
Producer Support Estimate	3 408	7 927	6 989	829	5 614	10 846	11 635
Market Price Support	2 423	5 685	5 857	131	4 079	8 655	9 037
Total Support Estimate	3 818	11 181	10 715	3 987	7 642	11 750	12 063

Note: <sup>e</sup> provisional estimate.

Source: OECD (2005).

Another category in the total transfers is the General Services Support Estimate (GSSE) which consists of private or public general services provided to agriculture in general and not to individual farms. To put it simply, it is just the difference between the total transfers and the Producer Support Estimate (PSE). The most important item in this category is the financial cost of the intervention agencies. The burden of the mismanagement before 2000 played an important role in the total transfers following the start of the structural adjustment policies. Historical costs of intervention agencies accounted for significant shares in the total support estimate in 2001 and 2002.

The financial cost of the intervention agencies can easily be seen in Table 6.12. The shares of the transfers to the relevant state economic enterprises in total transfers increased from 5% in 1986-89 to 77% in 2001; this was followed by a drastic decline in 2004.

**Table 6.12 - Indicators of transfers to agriculture (%)**

	1986-89	1996-99	2000	2001	2002	2003	2004 <sup>e</sup>
TSE/GDP	4.2	5.9	5.4	2.7	4.2	4.9	4.0
Percent PSE	16.9	22.3	21.4	3.8	20.4	28.5	26.6
Percent CSE	-16.7	-20.5	-22.5	-1.7	-17.4	-26.3	-22.2
GSSE/TSE	10.6	29.2	34.8	79.2	26.5	7.7	3.5
R&D/TSE	1.5	0.4	0.2	0.7	0.4	0.3	0.2
Transfers to SEEs (million \$) <sup>a</sup>	188	3 088	3 605	3 054	1 909	772	272
Transfers to SEEs/TSE	4.6	27.5	33.6	76.6	25.0	6.6	2.3

Notes: <sup>a</sup> Duty losses and capital injections to TMO, TŞFAŞ, TEKEL, ÇAYKUR and transfers to ASCUs.

<sup>e</sup> provisional estimate.

Source: OECD (2005).

The share of total support in GDP increased from 4.2% to almost 6% from the late 1980s to the late 1990s. It decreased to 4% in 2004, which is still high in the OECD countries. The Percent Consumer Support Estimate (CSE) indicates that the major source of transfer to agriculture is consumers, who are taxed through distorted domestic prices. About four-fifths of the supports to producers are achieved through market price support (Table 6.13); the remainder falls on the taxpayer. The major item in budgetary support has changed from input subsidies to direct income payments.

**Table 6.13 - Types of producer support (%)**

Type of Support	1986-89	1996-99	2000	2001	2002	2003	2004 <sup>e</sup>
Market price	71	72	84	16	73	80	78
Payments based on output	0	2	5	55	3	2	3
Payments based on area	0	0	0	0	0	0	0
Payments on hist. entitlement <sup>a</sup>	0	0	0	8	22	17	18
Payments based on input use	29	26	11	21	2	1	2
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Note: <sup>a</sup> Including the DIS payments. <sup>e</sup> provisional estimate.

Source: OECD (2005).

Commodity-based producer support estimates are reported in % in Table 6.14. Following the drastic decreases in support to producers in 2001 due to the launching of the project to reform the agricultural support system coupled with the serious economic crisis, support to farmers seems to be picking up again in recent years. Recovery in non-cereal commodities is faster than in cereals. The % PSEs for sugar and beef are back to more than twice as high as the average for all commodities.

The Percent PSEs for cereals show different trends. Support to barley is back to the levels recorded in the 1990s. Support to wheat has started to fluctuate more in the recent past, whereas support to maize recovered faster reaching its peak of the last two decades. The main reason for the increasing support to maize farmers is the government's tendency to resort to import substitution. With the expanding needs of the feed industry coupled with isoglucose production, maize imports amounted to some 1.5 million tonnes in 2004.

**Table 6.14 – Commodity-based PSEs, 1986-2004 (%)**

	1986-89	1996-99	2000	2001	2002	2003	2004 <sup>e</sup>
Wheat	35	29	23	-4	13	39	16
Maize	21	36	32	7	16	38	43
Barley	25	39	27	5	5	23	27
Other grains	25	39	27	5	5	23	27
Oilseeds	21	39	42	27	11	25	23
Sugar	18	53	56	30	49	61	63
Beef and veal	13	47	54	44	53	61	53
Milk	53	49	43	-2	34	35	34
Sheep meat	14	14	21	-18	7	12	4
Poultry	24	27	30	15	28	24	41
Eggs	19	29	35	23	22	2	37
<b>All commodities</b>	<b>17</b>	<b>22</b>	<b>21</b>	<b>4</b>	<b>20</b>	<b>29</b>	<b>27</b>

Note: <sup>e</sup> provisional estimate.

Source: OECD (2005).

The shares of market price support in commodity-specific support to farmers for cereals are presented in Table 6.15. Almost all of the support to cereal farmers is achieved through the distortionary output price supports.

**Table 6.15 - Share of market price support in PSE for cereals, 1986-2004 (%)**

	<b>1986-89</b>	<b>1996-99</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004<sup>e</sup></b>
Wheat	53	59	73	n.a.	95	99	97
Maize	58	72	86	88	98	100	100
Barley	n.a.	73	82	75	95	100	100
<b>All commodities</b>	<b>71</b>	<b>72</b>	<b>84</b>	<b>16</b>	<b>73</b>	<b>80</b>	<b>78</b>

Note: <sup>e</sup> provisional estimate; n.a. not applicable (PSE are negative in at least one year of the period).

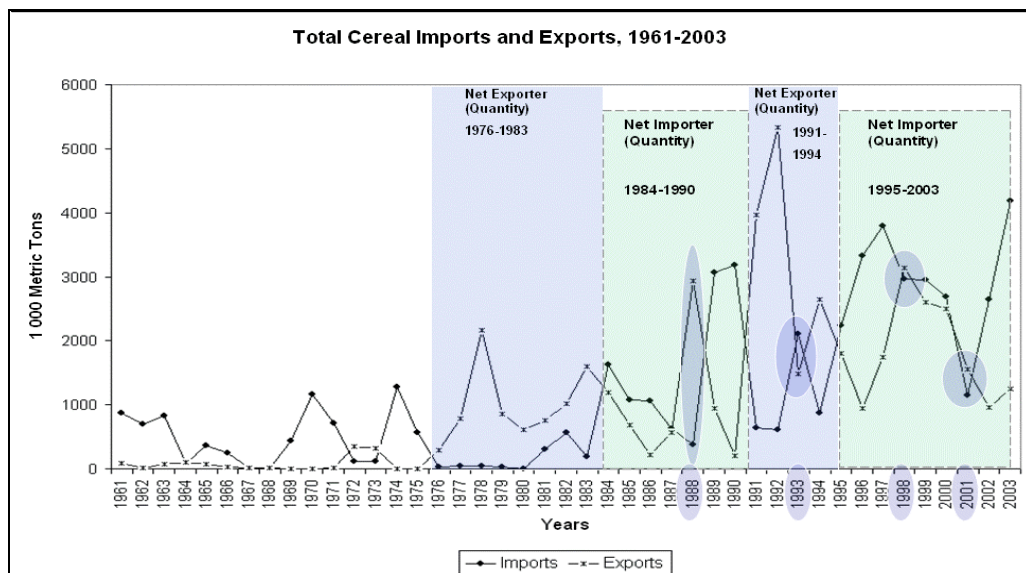
Source: OECD (2005).

## **6.5 – Trade in cereals**

In this section we shall first review Turkey's overall cereal trade flow and then in the following sub-section we shall analyse commodity-specific trade in greater detail.

### **6.5.1 - Overall trade in cereals**

Looking at the last 30 years in Figure 6.10, after 1976, one basically observes four periods for Turkey's cereal trade with several exceptional years. These four periods are marked in Figure 6.10 by dark areas. The first period can be defined as the period between 1976 and 1983. In this period, Turkey appears as a net exporter of total cereal products. However, from 1984 onwards, consistent with the economic liberalisation waves taking place in the country, Turkey switched to a net cereal importer position until 1990 with the exception of 1988. The years between 1991 and 1994 represent a short net exporter period for Turkey except for 1993. In the following period from 1995 to 2003, with the exception of 1998 and 2001, Turkey switched again from net exporter to net importer of cereal products.

**Figure 6.10 - Total cereal imports and exports (1 000 metric tonnes)**

Source: FAOSTAT, 2005a.

**Table 6.16 - Cereal import and export shares by country groups (shares of quantity, %)**

Years	IMPORTS				EXPORTS			
	EU10	EU15	EU	ROW	EU10	EU15	EU	ROW
1991	0.8	64.5	65.3	34.7	4.6	3.5	8.1	91.9
1992	1.4	26.9	28.3	71.7	1.3	1.9	3.2	96.8
1993	2.2	40.6	42.8	57.2	3.1	0.9	4.0	96.0
1994	6.6	53.5	60.1	39.9	2.1	3.8	5.9	94.1
1995	17.0	23.9	40.9	59.1	5.0	4.6	9.6	90.4
1996	10.0	24.3	34.3	65.7	4.7	5.5	10.2	89.8
1997	2.9	21.2	24.1	75.9	16.4	1.4	17.8	82.2
1998	24.2	12.6	36.8	63.2	1.0	2.8	3.8	96.2
1999	11.7	20.9	32.7	67.3	1.1	5.6	6.7	93.3
2000	4.1	16.0	20.1	79.9	2.4	18.5	20.9	79.1
2001	7.9	11.6	19.5	80.5	0.7	13.0	13.7	86.3
2002	29.8	10.2	39.9	60.1	1.3	24.6	25.9	74.1

Note: EU=EU10+EU15.

Source: FAOSTAT, 2005b.

Cereal import and export shares by country groups monitored are summarised in Table 6.16. Note that EU10 represents the new members of the EU; EU thus

denotes the sum of EU10 and EU15. In terms of imports, the first important finding is the sharp increase in the share of EU10 within the EU aggregate with some wide deviations. The EU10 countries' share of total EU cereal import share rose from 0.8% in 1991 to 29.8 % in 2002. In other words, in 2002, 29.8% of the total 39.9% EU cereal import share was the result of EU10 countries, yet this figure was only 0.8% in 1991, which was quite insignificant. This is an important change. There is a steady decrease in EU15's share within total EU cereal imports to Turkey after 1991.

If we take the 1991-2002 period average, EU cereal imports account for approximately 37% of Turkey's total cereal imports, leaving a 63% share for the rest of the world (ROW). However, after 1995, a decrease in imports from the EU is observed; accordingly, if we take the 1995-2002 period average, EU cereal imports account for about 31% of Turkey's total cereal imports.

Having investigated the general trend, now let us turn to the top five export and import partners of Turkey in the cereal trade in the 1990-1992 and 2000-2002 periods. According to the 1990-1992 averages, the biggest cereal exporter to Turkey was France with close to 301 000 tonnes and about 50 million US\$, the second was Argentina with about 190 000 tonnes and close to 36 million US\$, the third was Namibia with close to 80 000 tonnes and about 11.5 million US\$, the fourth was Spain with about 41 500 tonnes and 5.7 million US\$, and the fifth was Romania with about 40 000 tonnes and 7 million US\$. When we investigate the 2000-2002 averages, we see that the US replaced France to become Turkey's largest cereal exporter with about 877 000 tonnes and 111 million US\$, the second largest exporter was Germany (replacing Argentina) with close to 211 000 tonnes and about 30 million US\$, the third was Slovenia (replacing Namibia) with about 164 000 tonnes and close to 19 million US\$, the fourth was Hungary (replacing Spain) with about 149 000 tonnes and 17.5 million US\$, and the fifth was Serbia and Montenegro (replacing Romania) with close to 136 000 tonnes and 18 million US\$.

Regarding exports, from Table 6.16, a gradual increase in Turkey's total cereal exports to the EU is observed with some wide fluctuations. The EU's 8.1% share within Turkey's total cereal exports climbed to 25.9% in 2002 leading to a corresponding decrease in the share of the rest of the world from 91.9% to 74.1% in 2002. Note, however, that due to wide variations the overall period average is 10.8% for the EU and 89.2% for the rest of the world. In conclusion, although one can say that Turkish cereal exports to the EU increased after 1995, the main trade partner of Turkey in terms of Turkish cereal exports are not EU countries. According to the 2000-2002 average cereal export figures, Tunisia is the biggest importer of Turkish cereals with about 255 000 tonnes; the second is Bangladesh with close to 169 000 tonnes; the third is Egypt with 154 000 tonnes; the fourth is Ukraine with 125 000 tonnes, and the fifth is Italy with close to 124 000 tonnes.

Table 6.17 - Turkey's total cereal trade

TURKEY'S TOTAL CEREAL IMPORTS								
FROM	TONNES	SHARES		1 000 US\$		SHARES		
	2000-	1990-	2000-	1990-	2000-	1990-	2000-	
	1990-1992	2002	1992	2002	1992	2002	1992	2002
EU25	433 337	593 104	50.9	28.2	67 624	77 483	49.2	28.2
Argentina	190 222	101 005	22.4	4.8	35 734	14 781	26.0	5.4
Australia		104 576	0.0	5.0		17 512	0.0	6.4
Canada	30 588	32 714	3.6	1.6	4 264	4 911	3.1	1.8
USA		877 270	0.0	41.7		111 041	0.0	40.5
ROW	196 465	394 006	23.1	18.7	29 769	48 715	21.7	17.8
<b>TOTAL</b>	<b>850 612</b>	<b>2 102 676</b>	<b>100.0</b>	<b>100.0</b>	<b>137 391</b>	<b>274 443</b>	<b>100.0</b>	<b>100.0</b>

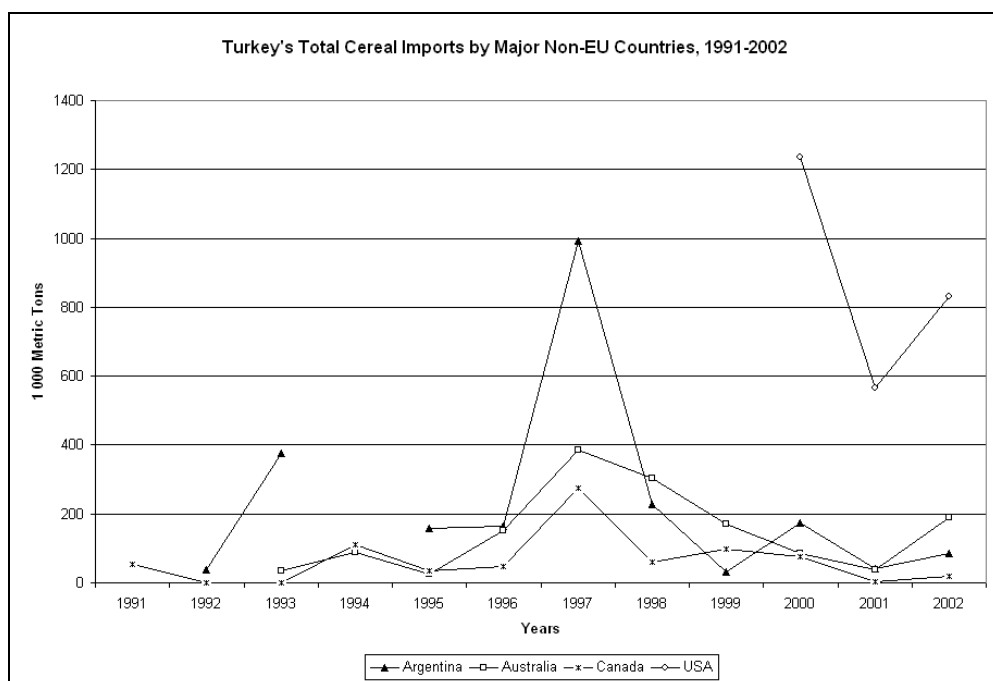
TURKEY'S TOTAL CEREAL EXPORTS								
TO	TONNES	SHARES		1 000 US\$		SHARES		
	2000-	1990-	2000-	1990-	2000-	1990-	2000-	
	1990-1992	2002	1992	2002	1992	2002	1992	2002
EU25	114 062	251 614	5.7	19.3	16 973	36 685	9.7	24.0
Argentina			0.0	0.0			0.0	0.0
Australia		1	0.0	0.0		0	0.0	0.0
Canada	1	4	0.0	0.0	0	2	0.0	0.0
USA		21	0.0	0.0		45	0.0	0.0
ROW	1 900 647	1 049 663	94.3	80.7	157 919	116 278	90.3	76.0
<b>TOTAL</b>	<b>2 014 709</b>	<b>1 301 303</b>	<b>100.0</b>	<b>100.0</b>	<b>174 892</b>	<b>153 009</b>	<b>100.0</b>	<b>100.0</b>

Source: FAOSTAT, 2005b.

We should consult Table 6.17 in order to analyse the situations of some important trade partners of Turkey which are non-EU countries. In terms of quantity imported, according to the 1990-1992 averages, the biggest share was achieved by the EU with 50.9%, followed by ROW with 23.1% and, third, Argentina with 22.4%. However, if we look at the 2000-2002 averages, we do not observe a similar trade flow pattern since Argentina's share falls drastically to 4.8% and the US share increases sharply from zero to 41.7%. In addition, the Australian share rises from zero to 5% (in 1990-1992), and the shares of ROW countries drop from 23.1% to 18.7%. The sum of Argentina, Australia, Canada and the US amounts to a share of 53.1% in the 2000-2002 period, although their share was only 33.7% in 1990-1992. In addition to these developments, the EU share drops from 50.9% in 1990-1992 to 28.2% in 2000-2002. Another important finding from Table 6.17 is the large increase in the amount of Turkey's total cereal imports from 0.85 million tonnes to 2.1 million tonnes. These quantities correspond to a total cereal import volume of 137 million US\$ in 1990-1992 and 274 million US\$ in 2000-2002. This situation reveals Turkey's growing cereal import market because of the insufficient increase in production coupled with the country's significant population growth. With regard to the EU, no significant change is observed in the total volume of cereal imports since the figure of 67.6 million US\$ recorded in 1990-1992 increased to only 77.5 million US\$ in 2000-2002 due to the considerable decline in the US share within Turkey's total cereal imports.

Figures 6.11 and 6.12 represent the time series data for Turkey's total cereal imports by major non-EU countries monitored, namely Argentina, Australia, Canada and the US. One can see from the figures that the US entered Turkey's cereal import market in 2000 and rapidly captured the main share of trade volume. Lastly, note that, in 1997, Argentina alone exported close to 1 million tonnes of cereals to Turkey with a trade volume of about 160 million US\$. This situation in fact shows Argentina's trade potential as a cereal exporter to Turkey.

**Figure 6.11 - Turkey's total cereal imports by major non-EU countries  
 (1 000 metric tonnes)**

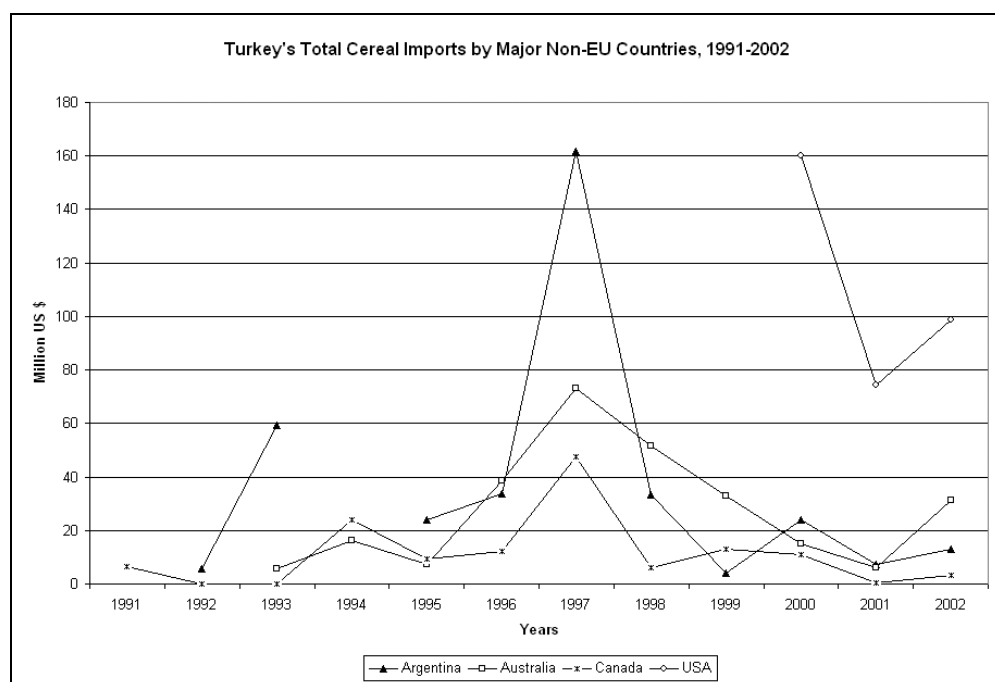


Note: The "Cereal" aggregate represents the sum of wheat, rice (paddy), barley, maize, rye, oats, millet, canary seed, and mixed grain products.

Source: FAOSTAT, 2005b.



**Figure 6.12 - Turkey's total cereal imports by major non-EU countries (million US\$)**



Note: The "Cereal" aggregate represents the sum of wheat, rice (paddy), barley, maize, rye, oats, millet, canary seed, and mixed grain products.

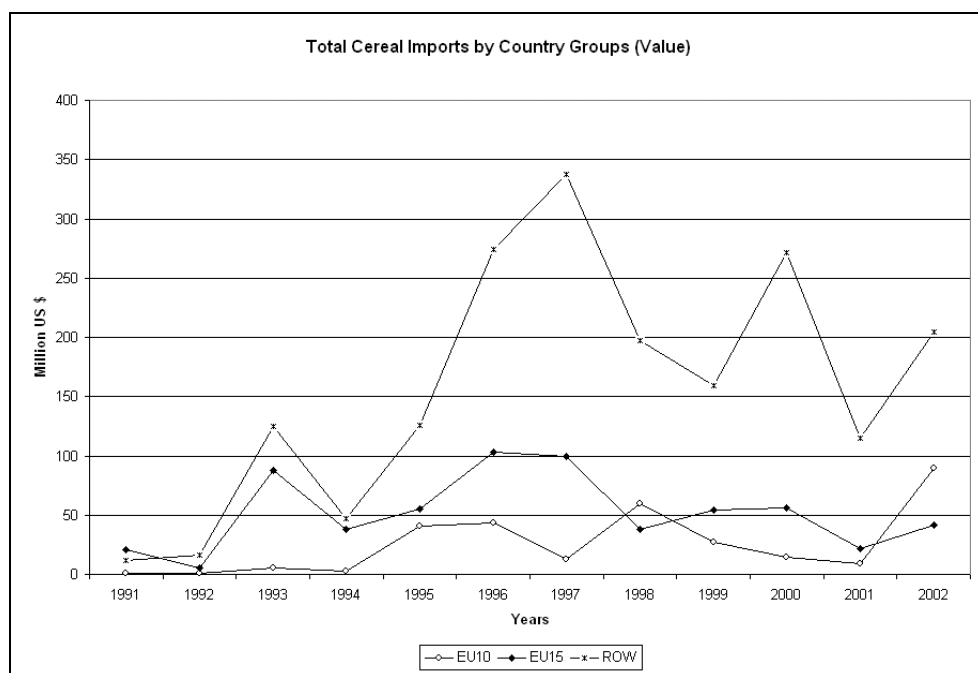
Source: FAOSTAT, 2005b.

Figures 6.13 to 6.16 summarise the flows and volumes of Turkey's cereal imports and exports by EU and ROW country groups. Note that the EU aggregate has been divided into EU10 and EU15 in order to reflect the trends for each group separately. Figure 6.13 shows that the total cereal import volume of the EU15 countries fluctuates between about 25 million US\$ and 110 million US\$ in the period from 1991 to 2002. The total cereal quantity imported from the EU15 countries ranges from about 250 000 tonnes to about 650 000 tonnes in this period. When we look at the EU10 countries, we see that, after the collapse of the USSR in 1992, their imports started to increase with some variations but the data shows a positive trend over the years 1993-2002. When we look at to the non-EU countries, we see that after 1995 there is a rise in their exports to Turkey. From the graph, after 1995, one can point out that Turkey's increasing cereal demand has been satisfied basically by non-EU countries rather than by EU members. This situation shows first of all the tremendous potential for trade in cereals between the EU and Turkey and, secondly, it shows the good trade performance of several non-EU countries such as

Argentina, Australia, Canada and the US. As shown in Figure 6.14, the total quantity of non-EU member countries' cereal exports to Turkey ranges from 750 000 tonnes to about 2 100 000 tonnes in the period from 1995 to 2002. From Figure 6.13, for the same period, we see that cereal import volumes from non-EU countries range from a value of about 125 million US\$ to about 340 million US\$.

As for Turkey's cereal exports, we see from Figure 6.15 that the EU10 countries show a negative trend over the period. The downward trend in Turkey's cereal exports to EU15 countries reversed and Turkish cereal exports started to increase particularly after 1997 with wide fluctuations. Note that the decreasing trend in Turkish cereal exports to non-EU member countries also reversed in 1997 and there was then a sharp increase in 1998 amounting to some 250 million US\$ and about 2 500 000 tonnes. However, in the following years exports started to decline steadily and ended up at about 50 million US\$ and 500 000 tonnes in 2002.

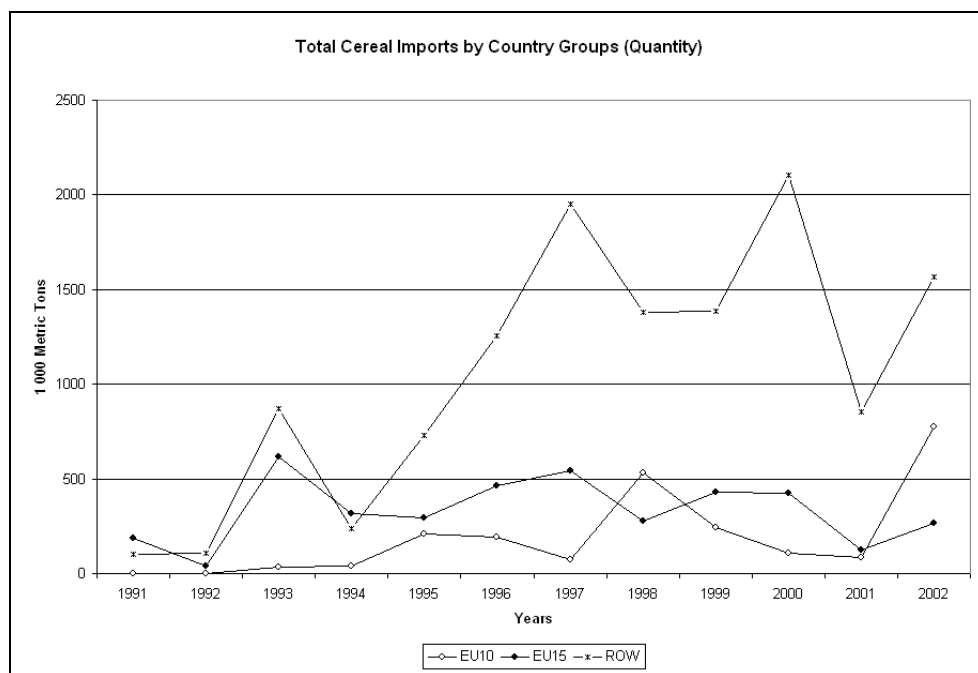
**Figure 6.13 - Turkey's total cereal imports by country groups (million US\$)**



Note: The "Cereal" aggregate represents the sum of wheat, rice (paddy), barley, maize, rye, oats, millet, canary seed, and mixed grain products.

Source: FAOSTAT, 2005b.

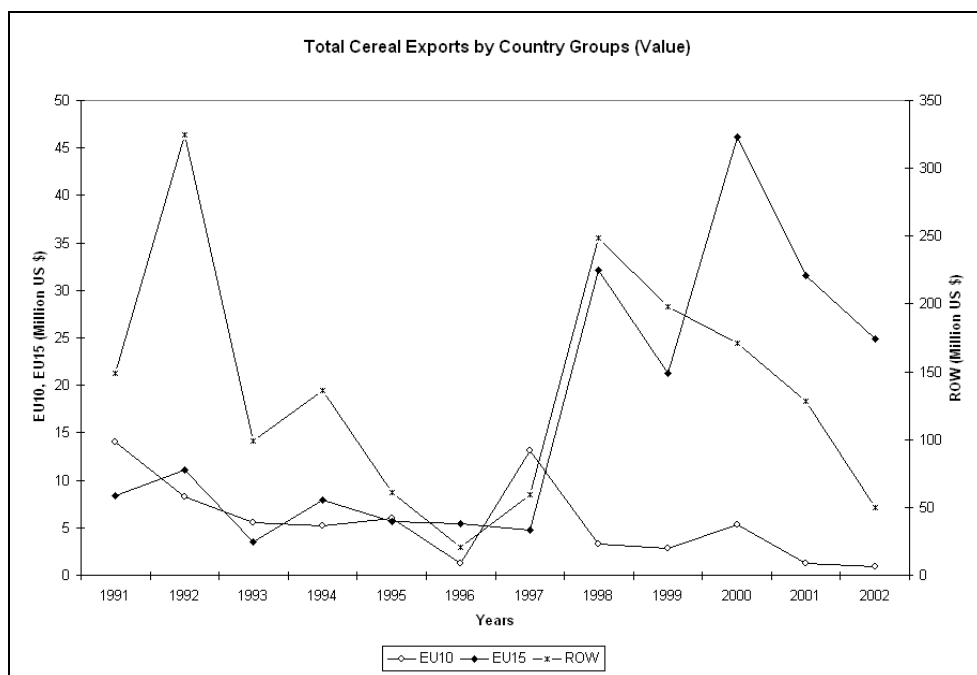
**Figure 6.14 - Turkey's total cereal imports by country groups  
(1 000 metric tonnes)**



Note: The "Cereal" aggregate represents the sum of wheat, rice (paddy), barley, maize, rye, oats, millet, canary seed, and mixed grain products.

Source: FAOSTAT, 2005b.

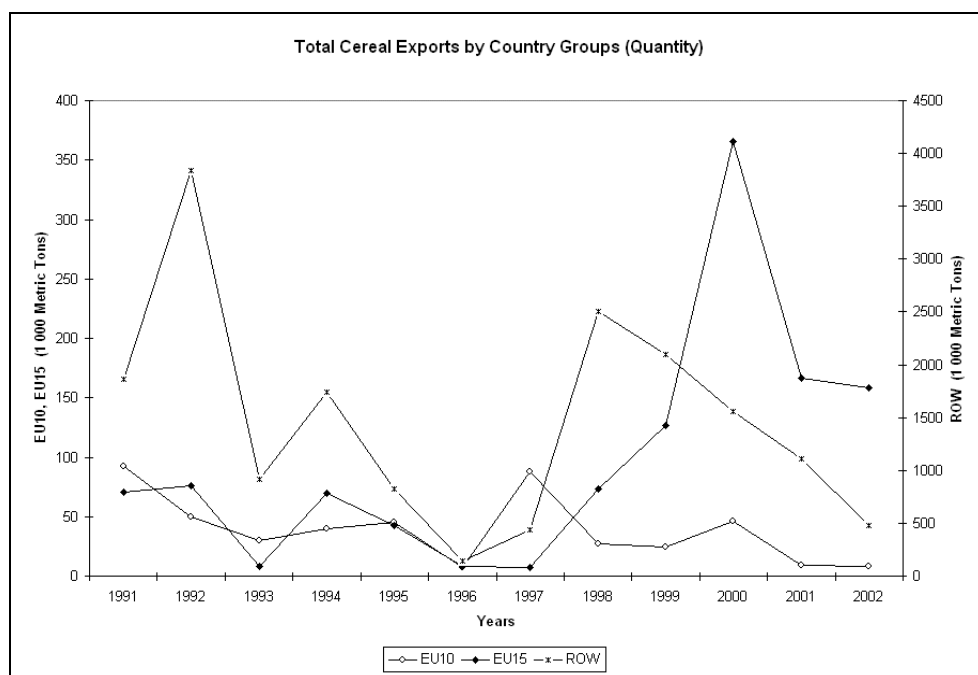
**Figure 6.15 - Turkey's total cereal exports by country groups (million US\$)**



Note: The "Cereal" aggregate represents the sum of wheat, rice (paddy), barley, maize, rye, oats, millet, canary seed, and mixed grain products.

Source: FAOSTAT, 2005b.

**Figure 6.16 - Turkey's total cereal exports by country groups  
(1 000 metric tonnes)**



Note: The “Cereal” aggregate represents the sum of wheat, rice (paddy), barley, maize, rye, oats, millet, canary seed, and mixed grain products.

Source: FAOSTAT, 2005b.

**Table 6.18 - Total cereal trade unit values for 1991-2002  
(US\$/ metric tonnes)**

Years	Exports			Imports		
	EU10	EU15	ROW	EU10	EU15	ROW
<b>1991</b>	151	119	124	302	112	124
<b>1992</b>	166	145	151	333	124	151
<b>1993</b>	186	424	144	159	143	144
<b>1994</b>	131	112	178	66	118	178
<b>1995</b>	133	133	178	195	188	178
<b>1996</b>	179	634	219	225	221	219
<b>1997</b>	149	626	173	166	183	173
<b>1998</b>	121	441	135	113	138	135
<b>1999</b>	118	168	115	112	126	115
<b>2000</b>	114	126	129	132	132	129
<b>2001</b>	133	189	133	111	175	133
<b>2002</b>	111	157	125	115	157	125

Note1: The "Cereal" aggregate represents the sum of wheat, rice (paddy), barley, maize, rye, oats, millet, canary seed, and mixed grain products.

Source: FAOSTAT, 2005b.

Table 6.18 shows that the unit value of exports and imports did not vary as much as the volume of exports and imports, except with a drastic fall in the prices of Turkish exports to EU15 countries. The effect of this fall is reflected as a boost in exports to these countries. The unit value for exports shows a downward trend especially after 1996. The same trend, although less marked, can be observed in import prices. The average import unit prices for the 2000-2002 period are 119 US\$, 155 US\$ and 129 US\$ for EU10, EU15 and ROW respectively. Thus, in terms of import unit prices, those of imports from the EU15 countries are highest, then comes ROW, and the cheapest import unit values are from the EU10 countries. When one examines the average export unit prices, approximately the same price pattern is observed with 119 US\$, 157 US\$, and 129 US\$ for EU10, EU15 and ROW respectively. Note lastly the really high unit prices for exports to EU15 countries in 1993, 1996, 1997 and 1998; these high figures are interesting but could result in part from statistical mistakes in trade data.

### **6.5.2 - Commodity specific trade flows in cereals**

Table 6.19 summarises the flow and volume of Turkey's total cereal trade for 2002. It can be seen that Turkey was a net importer of all cereal products, except barley, in 2002. The trends depicted in Figures 6.13 to 6.16 suggest that this is likely to continue.

Turkey is a net barley exporter with a volume totalling some 56.5 million US\$. When we look at the country groups in Table 6.20, we can see that the same pattern is valid for Turkish cereal trade with both the EU and the non-EU group.

**Table 6.19 - Turkey's trade in cereal products with world (2002)**

	Exports (tonnes)	Exports (1 000 US\$)	Imports (tonnes)	Imports (1 000 US\$)	Net exports (1 000 US\$)
<b>Wheat</b>	38 680	6 549	1 097 768	148 007	-141 458
<b>Barley</b>	595 825	58 909	16 756	2 435	56 474
<b>Maize</b>	7 643	9 945	1 177 660	133 754	-123 809
<b>Rice paddy</b>	183	168	292 025	48 803	-48 635
<b>Rye</b>	0	0	18 279	1 727	-1 727
<b>Oats</b>	0	0	5 188	317	-317
<b>Millet</b>	136	33	3 653	475	-442
<b>Canary Seed</b>	11	4	735	127	-123
<b>CEREALS</b>	<b>642 478</b>	<b>75 608</b>	<b>2 612 064</b>	<b>335 645</b>	<b>-260 037</b>

Source: FAOSTAT, 2005b.

When we look at the overall cereal trade from Table 6.19, we see that Turkey is a net cereal importer with about 260 million US\$ in 2002. Of this total, wheat and maize shared approximately 141 million US\$ and 124 million US\$ respectively.

Table A5 in the Appendix reports Turkish export and import data for 2002 for each cereal product and for each EU member country. In 2002, for example, Germany and Italy were the most important importers of Turkish wheat. The main EU wheat exporters to Turkey were Germany and Slovenia with about 217 000 tonnes amounting to a total of some 34 million US\$ and 395 000 tonnes amounting to a total of some 45 million US\$ respectively. Interestingly, France was not a major trade partner of Turkey in terms of wheat either as importer or as exporter in 2002.

Spain is the most prominent trade partner of Turkey in barley exports. On the other hand, France is the biggest barley exporter to Turkey with approximately 16,750 tonnes and approximately 2.4 million US\$.

In 2002, France, Italy and Spain are seen as the main maize importing countries from Turkey; exports to France amounted to about 1 900 tonnes with a value of 3.2 million US\$. About 1 400 tonnes of maize were exported to both Italy and Spain. The total volume of maize exported to these three countries accounted for more than 75% of Turkey's total maize exports to the EU. The only significant maize imports in 2002 came from a new member: Hungary's exports to Turkey accounted for almost all of Turkish maize imports from the EU25, amounting to approximately 316 000 tonnes and approximately 35 million US\$.

As for (paddy) rice, the only exporter from the EU to Turkey in 2002 was Slovenia with about 2 500 tonnes and 294 000 US\$. On the other hand, we see in Table A5 that Turkey's rice exports to EU countries are negligible.

**Table 6.20 - Turkey's trade in cereal products with the EU and ROW (2002)**

	EU						
	Exports (tonnes)	Export share (%)	Exports (1 000 US\$)	Imports (tonnes)	Import share (%)	Imports (1 000 US\$)	Net exports (1 000 US\$)
<b>Wheat</b>	24 139	62.41	4 146	689 858	62.84	90 888	-86 742
<b>Barley</b>	135 929	22.81	12 920	16 756	100.00	2 435	10 485
<b>Maize</b>	6 219	81.37	8 561	316 151	26.85	36 239	-27 678
<b>Rice, paddy</b>	160	87.43	149	2 561	0.88	294	-145
<b>Rye</b>	0	0.00	0	17 783	97.29	1 698	-1 698
<b>Oats</b>	0	0.00	0	4	0.08	7	-7
<b>Millet</b>	38	27.94	17	2	0.05	1	16
<b>Canary seed</b>	11	100.00	4	0	0.00	0	4
<b>CEREALS</b>	<b>166 496</b>	<b>25.91</b>	<b>25 797</b>	<b>1 043 115</b>	<b>39.93</b>	<b>131 562</b>	<b>-105 765</b>
	ROW						
	Exports (tonnes)	Export share (%)	Exports (1 000 US\$)	Imports (tonnes)	Import share (%)	Imports (1 000 US\$)	Net exports (1 000 US\$)
<b>Wheat</b>	14 541	37.59	2 403	407 910	37.16	57 119	-54 716
<b>Barley</b>	459 896	77.19	45 989	0	0.00	0	45 989
<b>Maize</b>	1 424	18.63	1 384	861 509	73.15	97 515	-96 131
<b>Rice, paddy</b>	23	12.57	19	289 464	99.12	48 509	-48 490
<b>Rye</b>	0	0.00	0	496	2.71	29	-29
<b>Oats</b>	0	0.00	0	5 184	99.92	310	-310
<b>Millet</b>	98	72.06	16	3 651	99.95	474	-458
<b>Canary seed</b>	0	0.00	0	735	100.00	127	-127
<b>CEREALS</b>	<b>475 982</b>	<b>74.09</b>	<b>49 811</b>	<b>1 568 949</b>	<b>60.07</b>	<b>204 083</b>	<b>-154 272</b>

Source: FAOSTAT, 2005b.



## **6.6 – Conclusion**

Some 14 million hectares of land have been devoted to growing cereals in Turkey during the last two decades. The growth in cereal production has been achieved basically through increase in yields. A minor degree of substitution occurred on the supply side with declining areas of rice and other cereals such as rye, and wheat, barley and maize occupied slightly larger areas. Jumps in production were achieved basically through technological improvements in wheat during the late 1970s and maize in the mid 1980s, apart from the expansion of irrigated land. The average growth in yield was still less than the growth in population. Per capita human consumption of cereals declined as a result of growth in income. The increase in production was closely followed by the increase in the use of cereals as feed and seed, with fluctuating imports and exports.

Commodity-based self-sufficiency (rather than food security) is the basic policy objective of governments, and high border protection combined with non-tariff barriers in cereals help to achieve this goal. However, due to the climate dependency of cereal production, Turkey's supply to the world markets fluctuates widely. When the weather conditions are favourable, Turkey becomes a net exporter; however, its position as net importer of all major cereals has prevailed in recent years.

One word of caution with regard to trade statistics is necessary here. The trade statistics in this study show trade in primary commodities only, but it would seem that the exports of agro-food products have been expanding in the recent years (Çakmak and Akder, 2005). This rather positive development of exporting value-added products rather than bulk commodities to the world markets may be improved through the shift of producer-oriented transfer policies in agriculture towards productivity-enhancing technological improvement policies. Furthermore, primary commodities cannot be exported without export subsidies, since the domestic prices of cereals are at least 50% higher than border prices. The major exporters of cereals in Turkey are state economic enterprises and the difference between procurement and export prices is made up by the Treasury as "duty losses".

Past experience has shown that import substitution policies (except in the case of barley) have been foremost in the minds of policy makers. Price distortionary transfers to the cereal sector were not effective in increasing output and decreasing the fluctuations in production. During the last two decades, the only significant increase in production and yield has been achieved in maize due to the use of hybrid varieties. The recent increase in the production of rice is due to the government output price support for rice.

The interaction between animal and cereal production should be borne in mind. The major reason for the stagnation of livestock in the animal sector is due to the

price policies on the cereal markets. Highly distortionary support in intermediate inputs results in policies creating even greater distortions on the animal product output markets with limited or no growth and even contraction in domestic supply.

Turkey is on the verge of trade liberalisation in agricultural products, especially in cereals. The new negotiating round of the WTO Agreement on Agriculture and the candidacy for EU membership will put enormous pressure on the cereal markets in about ten years' time. The delays in finalising the new WTO Agreement on Agriculture and the EU accession period may allow Turkey to pursue past policies in cereals for about a decade, but the country will eventually be forced to shift to policies which will enhance the structure of production. Turkey seems to have two effective policies to consider: upgrade land and decrease the semi-arid nature of production (increasing access to irrigation) and/or invest in R&D for technology transfer.

## **Appendices**

### **A1 – NUTS<sup>2</sup> regions of Turkey (TR)**

TR1	TR2	TR3	TR4	TR5	TR6
<b>Istanbul</b>	<b>Tekirdağ</b> Edirne Kırklareli <b>Balıkesir</b> Çanakkale	<b>Izmir</b> <b>Aydın</b> Denizli Muğla <b>Manisa</b> Afyon Kütahya Uşak	<b>Bursa</b> Eskişehir Bilecik <b>Kocaeli</b> Sakarya Düzce Bolu Yalova	<b>Ankara</b> <b>Konya</b> Karaman	<b>Antalya</b> Isparta Burdur <b>Adana</b> Mersin <b>Hatay</b> K.Maraş Osmaniye

TR7	TR8	TR9	TRA	TRB	TRC
<b>Kırıkkale</b> Aksaray Niğde Nevşehir Kırşehir <b>Kayseri</b> Sivas Yozgat	<b>Zonguldak</b> Karabük Bartın <b>Kastamonu</b> Çankırı Sinop <b>Samsun</b> Tokat Çorum Amasya	<b>Trabzon</b> Ordu Giresun Rize Artvin Gümüşhane	<b>Erzurum</b> Erzincan Bayburt <b>Ağrı</b> Kars Iğdır Ardahan	<b>Malatya</b> Elazığ Bingöl Tunceli <b>Van</b> Muş Bitlis Hakkari	<b>G.Antep</b> Adiyaman Kilis <b>Şanlıurfa</b> Diyarbakır <b>Mardin</b> Batman Şırnak Siirt

Note: Turkey has 12 NUTS regions at Level 1. There are 26 NUTS regions at Level 2 with the bold represented cities. All cities are regional entities at NUTS Level 3.

Source: EUROSTAT, [http://europa.eu.int/comm/eurostat/ramon/nuts/codelist\\_en.cfm?list=cec](http://europa.eu.int/comm/eurostat/ramon/nuts/codelist_en.cfm?list=cec)

<sup>2</sup> La Nomenclature des Unités Territoriales Statistiques (Nomenclature of Territorial Units for Statistics).

**A2 – NUTS regions of Turkey at level 1**

TR1	TR2	TR3
Istanbul	Batı Marmara (West Marmara)	Ege (Aegean)

TR4	TR5	TR6
Doğu Marmara (East Marmara)	Batı Anadolu (West Anatolia)	Akdeniz (Mediterranean)

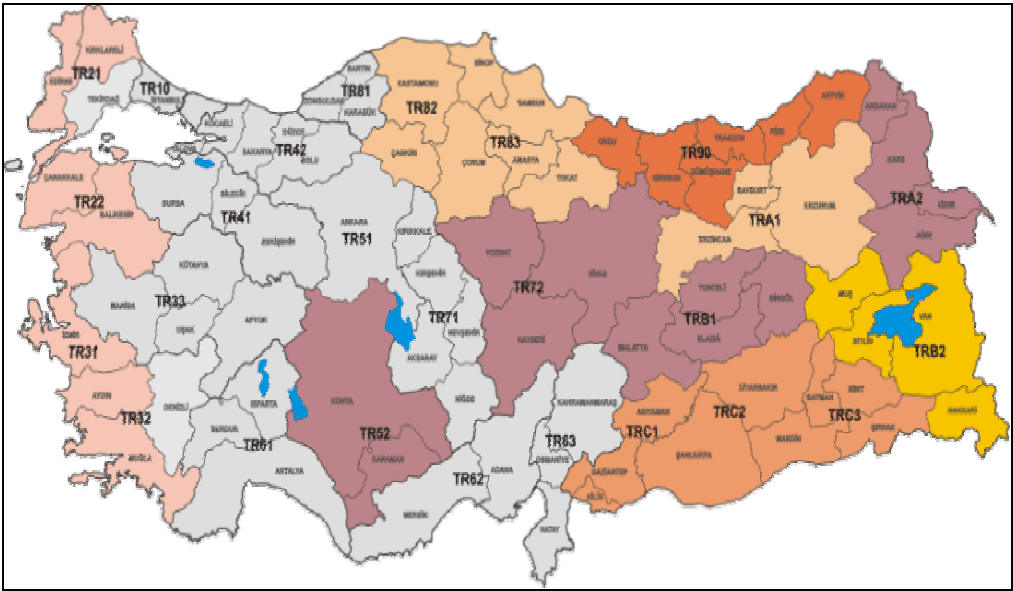
TR7	TR8	TR9
Orta Anadolu (Central Anatolia)	Batı Karadeniz (Western Black Sea)	Doğu Karadeniz (Eastern Black Sea)

TRA	TRB	TRC
Kuzey Doğu Anadolu (North-East Anatolia)	Orta Doğu Anadolu (East-Central Anatolia)	Güney Doğu Anadolu (South-East Anatolia)

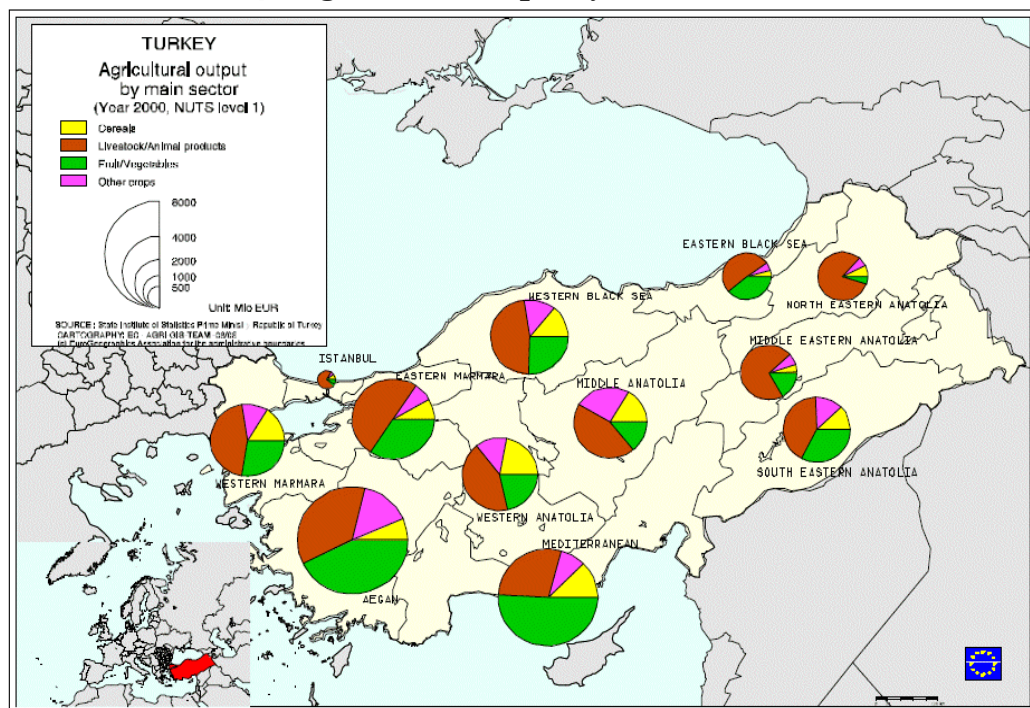
Source: EUROSTAT, [http://europa.eu.int/comm/eurostat/ramon/nuts/codelist\\_en.cfm?list=cec](http://europa.eu.int/comm/eurostat/ramon/nuts/codelist_en.cfm?list=cec)

**A3 – Map of Turkey (NUTS regions)**



Source: SPO, 2005.

### A4 – Agricultural output by sub-sector



Source: EU Commission (2003). Agricultural Situation in the Candidate Countries. Country Report: Turkey. DG-AGRI. November 2003. Brussels.

### A5 – Turkey's trade in cereal products with EU countries (2002)

	Exports (tonnes)	Export share (%)	Exports (1 000 US\$)	Imports (tonnes)	Import share (%)	Imports (1 000 US\$)	Net exports (1 000 US\$)
<b>WHEAT</b>							
Austria	4	0.02	2				2
Cyprus	62	0.26	10				10
Denmark	48	0.20	15				15
France	8	0.03	4				4
Germany	10 709	44.36	1 864	216 562	31.39	33 904	-32 040
Greece				5 723	0.83	1 121	-1 121
Hungary	9	0.04	4	39 374	5.71	5 721	-5 717
Italy	13 201	54.69	2 210				2 210
Lithuania				24 401	3.54	3 103	-3 103
Netherlands	51	0.21	21				21
Slovakia	20	0.08	5				5
Slovenia				395 413	57.32	45 390	-45 390
Spain				8 385	1.22	1 649	-1 649
Sweden	9	0.04	4				4
United Kingdom	18	0.07	7				7
<b>BARLEY</b>							
Cyprus	8 000	5.89	781				781
France	2	0.00	1	16 750	99.96	2 434	-2 433
Germany	1	0.00	0	5	0.03	1	-1
Hungary				1	0.01	0	
Spain	127 926	94.11	12 138				12 138
<b>MAIZE</b>							
Austria	2	0.03	1				1
Cyprus	205	3.30	43				43
Czech Republic	2	0.03	1				1
Denmark	3	0.05	3				3
France	1 901	30.57	3 162	138	0.04	522	2 640
Germany	690	11.10	947	11	0.00	124	823
Greece	107	1.72	239				239
Hungary				315 862	99.91	35 240	-35 240
Italy	1 426	22.93	1 793	3	0.00	37	1 756
Malta	9	0.14	5				5
Netherlands	401	6.45	640	70	0.02	157	483
Portugal	29	0.47	41				41
Spain	1 439	23.14	1 684	67	0.02	159	1 525
Sweden	3	0.05	1				1
United Kingdom	2	0.03	1				1
<b>RICE, PADDY</b>							
Cyprus	83	51.88	76				76
Germany	24	15.00	21				21
Greece	3	1.88	3				3
Netherlands	7	4.38	6				6
Slovenia				2 561	100.00	294	-294
United Kingdom	43	26.88	43				43

**A5 (contd.)**

	Exports (tonnes)	Export share (%)	Exports (1 000 US\$)	Imports (tonnes)	Import share (%)	Imports (1 000 US\$)	Net exports (1 000 US\$)
<b>RYE</b>							
Germany		0.00		17 783	100.00	1 698	-1 698
<b>OATS</b>							
Germany		0.00		4	100.00	7	-7
<b>MILLET</b>							
Cyprus	9	23.68	4				4
Germany	2	5.26	2				2
Netherlands	6	15.79	5				5
Portugal	21	55.26	6				6
Slovenia				2	100.00	1	-1
<b>CANARY SEED</b>							
Cyprus	11	100.00	4				4

Source: FAOSTAT, WATM, 2005b.

**A6.1 – Regional distribution of spelt production (2003)**

NUTS1	Area (ha)	Production (tonnes)	Yield (tonnes/ha)
TR8-SİNOP	3 598	2 742	0.762
TR8-KARABÜK	1 000	2 192	2.192
TR8-KASTAMONU	1 794	1 808	1.008
TR8-SAMSUN	1 100	1 356	1.233
TR4-BOLU	85	90	1.059
TR4-BİLEÇİK	23	12	0.522

Source: SIS, 2005.

**A6.2 – Regional distribution of rye production (2003)**

NUTS1	Area (ha)	Production (tonnes)	Yield (tonnes/ha)
TR7	66 878	117 499	1.757
TR5	26 807	44 575	1.663
TRA	17 605	26 666	1.515
TR4	8 545	16 008	1.873
TR2	5 241	11 193	2.136
TR6	3 648	9 081	2.489
TR3	3 936	6 058	1.539
TR8	3 556	4 364	1.227
TR9	2 312	2 787	1.205
TRB	1 469	1 758	1.197
TR1	3	11	3.667

Source: SIS, 2005.



### **A6.3 – Regional distribution of oats production (2003)**

<b>NUTS1</b>	<b>Area(ha)</b>	<b>Production (tonnes)</b>	<b>Yield (tonnes/ha)</b>
TR4	29 403	66 509	2.262
TR5	34 489	61 769	1.791
TR2	20 248	51 013	2.519
TR7	8 941	20 925	2.340
TR8	10 739	18 129	1.688
TR1	5 443	14 894	2.736
TR6	7 272	14 580	2.005
TR3	7 579	14 426	1.903
TR9	3 700	4 850	1.311
TRA	2 058	2 671	1.298
TRB	128	234	1.828

Source: SIS, 2005.

### **A6.4 – Regional distribution of mixed grain production (2003)**

<b>NUTS1</b>	<b>Area (ha)</b>	<b>Production (tonnes)</b>	<b>Yield (tonnes/ha)</b>
TR6-ADANA	2 185	3 267	1.495
TR8-KASTAMONU	2 526	3 266	1.293
TR9-GÜMÜŞHANE	1 142	1 635	1.432
TR5-KARAMAN	274	471	1.719
TR6-KAHRAMANMARAŞ	79	157	1.987
TR6-ANTALYA	189	141	0.746
TR3-MANİSA	105	63	0.600

Source: SIS, 2005.

**A6.5 – Regional distribution of millet production (2003)**

<b>NUTS1</b>	<b>Area (ha)</b>	<b>Production (tonnes)</b>	<b>Yield (tonnes/ha)</b>
TR3-KÜTAHYA	1 423	4 280	3.008
TRC-Dİ YARBAKIR	1 398	1 079	0.772
TR3-MUĞLA	853	954	1.118
TR3-İZMİR	80	199	2.488
TR6-İCEL	49	148	3.020
TRB-BİTLİS	64	145	2.266
TRB-BİNGÖL	20	59	2.950
TR6-ANTALYA	88	58	0.659
TR6-KAHRAMANMARAŞ	16	57	3.563
TR4-YALOVA	8	20	2.500
TRA-ERZURUM	1	1	1.000

Source: SIS, 2005.

**A6.6 – Regional distribution of canary seed production (2003)**

<b>NUTS1</b>	<b>Area (ha)</b>	<b>Production (tonnes)</b>	<b>Yield (tonnes/ha)</b>
TR1-İSTANBUL	364	450	1.236
TR2-TEKİRDAĞ	128	133	1.039
TR3-KÜTAHYA	5	11	2.200
TR7-AKSARAY	3	6	2.000

Source: SIS, 2005.

## **PART III**

# **Consumers and the health and environmental quality of products**

Martine PADILLA, CIHEAM-IAM Montpellier (France)  
Rachid HAMIMAZ, IAV Hassan II, Rabat (Morocco)  
Hiba EL DAHR, CIHEAM-IAM Montpellier (France)  
Rami ZURAYK, American University of Beyrouth AUB (Lebanon)  
Fadi MOUBARAK, ENSAM/IAMM/AUB (Lebanon)

## ***Introduction***

Man has known for over 25 centuries that his diet influences his health. The idea that a foodstuff is both a nutrient and a remedy has long marked man's behaviour ever since the teachings of the ancient Greek physicians: "Let your food be your medicine" was one of the maxims of Hippocrates. Now, centuries later, all of the actors on the food markets seem to have realised that food is the guarantee for maintaining well-being, and this has made health a convincing sales argument and an appreciable opportunity for developing the goods that claim to promote it.

Interest in health does not result in the same eating habits in all population groups, however. The development of the food markets in industrialised countries shows that the food system process is conditioned by consumer behaviour and by the strategies of private enterprises (Rastoin, 2004), which differ from those in southern Mediterranean countries in several respects. This process has led to the emergence of a ready market known as the "health food" or "health-enhancing food" market, which is a source of differentiation and profitability. But whereas the main cause of this mobilisation is the desire to seek new markets in sectors where goods have become commonplace, the broader issue of "health" supply in the countries of the South is still often related to food security in terms of quantity and even of food safety and harmlessness of foodstuffs.

Since most Mediterranean countries realise that they cannot compete on the mass market, they now fill a slot on these "health" or "environmental protection" market segments, two essential components to which consumers reportedly attach great importance in their preferences and choices. These choices are closely related to the risks perceived by consumers, as we shall see in the first section of this chapter. Markets are developing in Europe but also in the southern and eastern Mediterranean countries according to these risks: the market of organically produced products is expanding as is that of hydroponic products, products with a guaranteed nutrient content, or more sophisticated products such as health foods. Does the Mediterranean have a role to play in these market segments? This question will be examined in the second section. But can these products be developed in Mediterranean countries or are they doomed to be exported to effective demand markets? How do Mediterranean consumers view these types of foods? This will be discussed in the third section.

## ***7 The perception of risks and quality by Mediterranean consumers: elements of debate on the case of Morocco***

One of the effects of globalisation today is the fact that the slightest food problem is transmitted instantly throughout the world by the media. International food crises such as ESB, dioxin, or bird flu but also major cases of food poisoning such as the mortadella and fish incidents in Morocco now are certain to have an impact on consumer confidence in the products offered by the food production system. Consumers' perception of foodstuffs is seriously affected. The question thus arises of whether consumers in third world countries have an accurate perception of risks based on the real and objective attributes of the various products or whether, on the other hand, they are influenced by incomplete information which has not been checked and which comes from foreign media or is fuelled by rumour. A number of real risks go unnoticed due to the asymmetrical information typical of the markets in developing countries. The "consumerist" culture is underdeveloped and does not provide a basis for verifying the information and rumours which circulate from various sources. Other real risks can be grasped because there is a high level of consumer awareness (in the case of foreigners residing in Morocco or highly educated Moroccans) or because consumers have had direct experience of the risks involved (in the case of food poisoning, for instance). In both cases consumers face risks which they cannot identify, and they will therefore seek reassurance in the form of quality marks which are designed to boost consumer confidence and provide the desired security, since they are subject to stringent and reputable certification procedures (Caswell et Modjaska, 1996). Foodstuff qualification systems are thus reportedly sought and often preferred to trademarks or brand names, since they provide credible information and reduce the information asymmetries between producers and consumers.

The purpose of the present section is to cast light on a socio-economic issue which is one of the questions least examined in market research in developing countries: product quality as seen by consumers.

In standard economic theory it is presumed that consumers make their choices on the basis of quality in particular, but attention has never been devoted to what consumers actually perceive as quality, i.e. the quality that determines their choices rather than the quality determined by producers and industrialists. In their guidelines, the World Bank and other institutions lay the main emphasis on measures to improve quality for export and worry little about the quality of products consumed locally in developing countries.

The question that arises thus not only concerns how consumers perceive quality and what the health risks actually are, but also the national monitoring system and the new technologies used by the AFIs.

### **Our objectives are thus:**

- to highlight the issues at stake in foodstuff quality and safety in developing countries by analysing quality on both external and domestic markets on the one hand and presenting the current institutional organisation of quality in Morocco on the other;
- to determine how Moroccan consumers perceive foodstuff quality and to identify the main criteria on which they base their opinions as well as the health risks inherent in certain products, the aim being to evaluate the level of consumer awareness of the actual quality of foodstuffs in Morocco;
- to assess how tourists perceive the quality of Moroccan foodstuffs and to analyse their purchasing patterns;
- to compare the quality assessment criteria – of Moroccan consumers and experts, of Moroccan consumers and tourists, and of Moroccan consumers and French consumers (CREDOC survey, 1999);
- to compare how toxicological risks are perceived by Moroccans with the actual data on food poisoning incidents;
- to evaluate the importance of the toxicological risk factor in the explanation of the demand for quality marks on certain products.

### **7.1 - The challenges of quality and risks in developing countries**

Defining foodstuff quality and safety is a universal imperative. What is dangerous for the European citizen is also dangerous for any other citizen throughout the world. It is different from other quality aspects such as organoleptic quality, which is more a question of cultural reference or of learning than of objective criteria.

***In order to define the concept of health risk we shall take as a basis the definition proposed by the Regulation of the European Parliament establishing the European Food Safety Authority and laying down the procedures concerning foodstuff safety.***

**Food shall be deemed to be unsafe if it is considered to be:**

- a) injurious to health;
- b) unfit for human consumption.

**In determining whether any food is unsafe, regard shall be had:**

- a) to the normal conditions of use of the food by the consumer and at each stage of production, processing and distribution, and
- b) to the information provided to the consumer, including information on the label, or other information generally available to the consumer concerning the avoidance of specific adverse health effects from a particular food or category of foods.

**In determining whether any food is injurious to health, regard shall be had:**

- a) not only to the probable immediate and/or short-term and/or long-term effects of that food on the health of a person consuming it, but also on subsequent generations;
- b) to the probable cumulative toxic effects;
- c) to the particular health sensitivities of a specific category of consumers where the food is intended for that category of consumers.

*Article 14: Food safety requirements, Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002.*

The quality challenge is of a dual nature. It is international in that certain products of developing countries are exported to the demanding markets of rich countries with the risk that a product will be rejected if it does not meet the required health standards. And it is national, since certain foodstuffs whose export is refused due to a health hazard are sold on domestic markets. This is possible due to the absence of effective quality control and the very low level of consumer awareness.

### **7.1.1 - Quality and safety of exported foodstuffs**

One way of assessing the quality and safety of Moroccan products on export markets is to analyse the cases reported by the European RASFF (rapid alert signal for food and feed).

The rapid alert system set up by the European Commission informs the competent authorities in one of the member states of the existence of a food product entailing a serious risk for consumer health hazard. A distinction is made in this system between alert notification and information notification. The former means that the product presenting a contamination risk is already on the market of one of the member states and that it has been, or is in the process of being, withdrawn. And an information notification is issued for products for which a contamination hazard has been identified before it enters the European market and all measures have been taken to ensure that it is rejected. The following table lists the various types of contaminated products that have been identified over the last four years by the

rapid alert system set up by the Directorate General for Health and Consumer Protection of the European Commission. Products coming from Asia pose the most problems; they are followed by products from Europe, Latin America, Africa, North Africa, North America and, finally, Oceania (Figure 1).

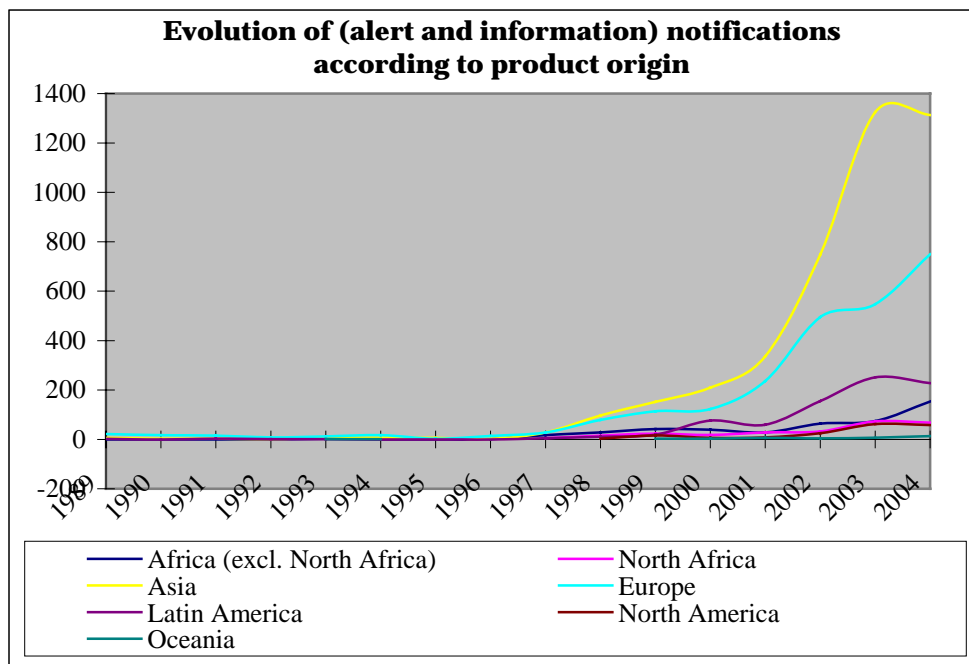
**Table 7.1 – Types of contamination and incriminated products (all origins) identified by the rapid alert system (RASFF) of the DG Health and Consumer Protection of the European Commission (2002 to 2005)**

<b>Types of poisoning</b>	<b>Incriminated products</b>
Aflatoxins and mycotoxins <sup>1</sup>	nuts, nut products and snacks, fruit and vegetables, cereal products and bakery products
Microbiological contamination	poultrymeat and poultrymeat products, shell fish and seafood products, fish and fisheries products (other than shellfish and molluscs), milk and milk products
Residue of veterinary products	shellfish and seafood products, fish and fisheries products (other than shellfish and molluscs), confectioners' honey and royal jelly, eggs and egg products, milk products and milk, animal feed, meat products and meat (other than poultrymeat)
Heavy metals	fish and fisheries products (other than shellfish and molluscs), shellfish and seafood products
(Other) chemical contamination	fats and oils, herbs and spices, fruit and vegetables, fish and fisheries products (other than shellfish and molluscs), soups, stocks and sauces, cereal products and bakery products

Source : Annual Report on the Functioning of the RASFF, 2002, 2003, 2004, Rapid Alert System for Food and Feed (RASFF), European Commission, Directorate-General for Health & Consumer Protection.

<sup>1</sup> Aflatoxin is a generic term denoting a group of toxins which are produced by two moulds, *Aspergillus flavus* and *Aspergillus parasiticus*. These moulds develop naturally and are present in several products that are used for human and animal consumption. Depending on the quantity present in the incriminated product, these toxins can be injurious to health as the cause of the development of certain cancerous tumours.



**Figure 7.1**

Source : based on the data published in the Annual Report on the Functioning of the RASFF, 2004, Rapid Alert System for Food and Feed.

When one examines the frequency with which products are called in question, Morocco was only concerned once in 2005 (according to the Weekly Reports already available) and 2003, and was not concerned at all in 2004. The contaminations were only of a microbiological nature (case of live bivalve molluscs). There is no comparison at all with certain Asian and Latin American countries.

It can thus be concluded that the efforts that have been made since the 1980s with a view to upgrading the export sectors in terms of foodstuff quality and safety have more or less borne fruit. This observation confirms certain analyses (Hamimaz et al, 2002) of the number and type of infringements detected by the Moroccan fraud authorities in the various types of agro-food sectors. The number of offences and the number of cases filed with the public prosecution department has decreased in the liberalised sectors (fisheries, pasta manufacture), which have to contend with high internal and external competition, compared to sectors which are still relatively protected and where products are intended for the domestic market

(milk, flours, etc.). These conclusions must, of course, be qualified, since there are still shortcomings<sup>2</sup>, but considerable adjustments have been made on the whole.

### **7.1.2 - Quality on the domestic market in Morocco**

So what is the situation on the internal market? Can it be said that export quality is to be found on the domestic market? There is no guarantee since, in the absence of a clear signal from consumers with regard to quality, and given the inefficiency of the structures for monitoring quality, there are no incentives to induce producers to achieve a level of quality equivalent to that required on entry to the European or American market.

Progressive market deregulation has had mixed effects on non-quality. There are fewer incidents of fraud in the pasta and couscous sectors due to competition from imported pasta (good value for money) and the availability of durum wheat semolina. The fruit and vegetable and seafood canning industries have had to cope with hygiene problems and have made considerable efforts because of the quality requirements on export markets. As regards milling plants, there has been a marked decrease in certain types of fraud but other infringements (damp, extraction above the authorised thresholds) have continued and are even on the increase. Instances of watering down are frequent in the milk processing industry, a fact which can be explained if one analyses milk collection practices. In low lactation periods quantity takes precedence over quality and firms are less concerned with standards. The aim is to satisfy demand (particularly when the low lactation period coincides with a period of high demand in connection with Ramadan, which has been the case for several years).

It is conceivable that in a completely open market a number of quality constraints will be lifted (as is the case with dairy products in particular), but non-quality is a highly profitable strategy in a market which is dominated by population segments with low purchasing power and where institutional structures for providing support, education, monitoring and justice are ineffective. Furthermore, the minimum conditions for the "consumerist culture" that is necessary if the population is to realise what is at stake in the quality context are still far from being met.

In the pasta and couscous sector, which has been exposed to foreign competition since the late 1990s, quality has improved appreciably, as can be seen from the decrease in offences detected by the fraud authorities. Within 10 years only dynamic undertakings that have been anxious to maintain quality standards have withstood the competition brought by market liberalisation.

---

<sup>2</sup> European Commission, Directorate-General for Health and Consumer Protection (2001), Final Report on a Mission to Morocco (28 May to 9 June 2001), whose purpose was to evaluate the official departments responsible for monitoring the production and export of fisheries products and live bivalve molluscs.

Can this scenario be extrapolated to sectors that are still relatively protected (milling plants, dairy firms, etc.) and that are developing on oligopolistic markets where demand is extremely elastic in terms of prices and unelastic in terms of quality? A tentative answer can be suggested by observing the Moroccan consumer rush on imported milk during Ramadan.

It is not necessarily the case that competition from abroad always brings quality. There is no reason why competitors (such as Turkey, Spain or even agro-food multinationals) should not develop a supply on the national market in view of the inadequacies of the institutional monitoring and information structures and of course the low purchasing power of the population. The same countries identified by the European RASFF are liable to "dump" their contaminated products (see Table 1) on Moroccan markets. Only reliable and efficient institutions will be able to impose the necessary safeguards on competitors and ultimately protect dynamic national industrialists from the unfair competition that can come from "above" (imports or multinational companies) and "below" (small national firms for which non-quality is a strategy).

Monitoring structures and structures for consumer education:

In Morocco the mission of monitoring the quality of agri-foodstuffs is the responsibility of the public authorities. It is split up between 9 structures under the authority of 4 ministerial departments, and this fragmentation poses dire problems of overlapping and coordination.

**Table 7.2 – Quality control structures in Morocco**

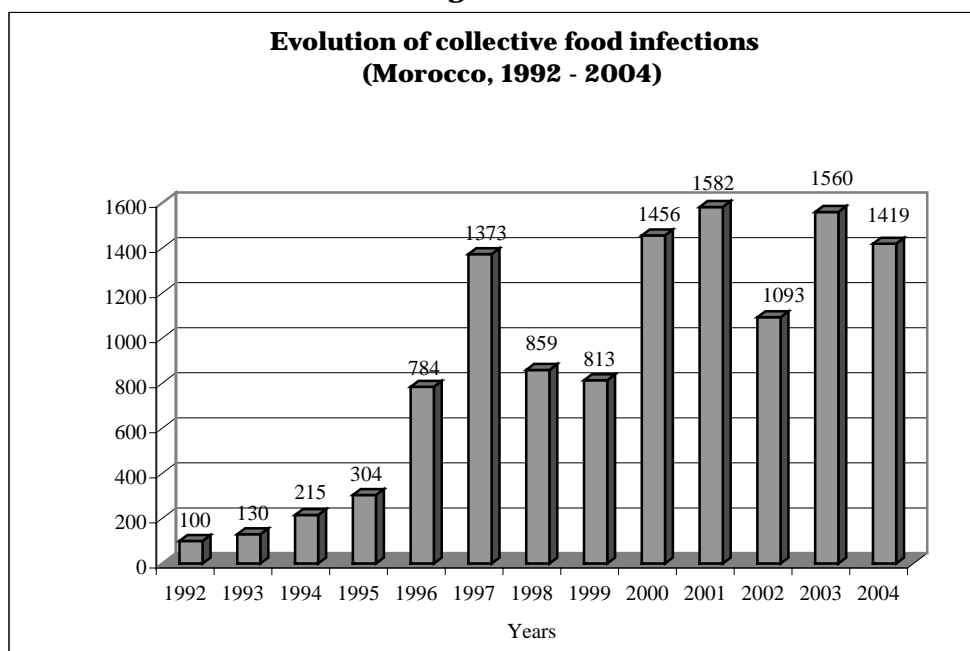
<b>Ministerial departments</b>	<b>Structures in charge</b>	<b>Coordinating bodies</b>
<b>Department of Agriculture</b>	<p>Directorate for Crop Protection, Technical Control and Fraud Control</p> <p>Directorate for Animal Husbandry</p> <p>Autonomous establishments for the control and coordination of exports</p> <p>ONICL (national interprofessional office for cereals and leguminous plants),</p> <p>Official analysis and research laboratory</p>	<p>Standing Interministerial Committee for Food Monitoring and Fraud Control in the Sale of Goods (established by law in 1968)</p> <p>the National Committee of the Codex Alimentarius (set up in 1998)</p> <p>the National Health Watch Unit (established by joint circular in September 2000 following the mortadella food poisoning incidents)</p>
<b>Department of Health</b>	Directorate for Epidemiology and for Disease Control	<p>Higher Interministerial Council for Quality and Productivity (established by decree in 1970)</p>
<b>Department of the Interior</b>	Mouhtassibs, DCAE (Ministry of the Interior) and DGCL (Directorate General for Local Authorities)	
<b>Department of Trade and Industry</b>	SNIMA (Moroccan Industrial Standardisation Department)	

This multiplicity of departments is an important factor in the inefficiency of the monitoring system. The consecutive budget cuts in the structural adjustment programmes in the 1980s resulted in a substantial reduction of means (for example, the official cars for inspectors who constantly have to go out into the field were done away with...).

Interviews with certain officers in quality institutions have confirmed that monitoring activities have been reduced in the past few years, a fact which can be seen from the limited number of statements actually filed (by the fraud authorities), whereas on the other hand economic activities (production, agro-food processing and the agro-tertiary sector of the food industry) are expanding as the result of urbanisation, population growth and the opening of the national market.

The increase in the number of instances of food poisoning (Figure 2) can also be attributed to this reduction of monitoring activity. The fact that certain national leaders and officials in international institutions (FAO)<sup>3</sup> are painfully aware of the need to reunify these departments in an independent Food Quality and Safety Control Agency such as the FDA in the United States has not yet produced any results due to the inveterate "clique mentality" and conflicts between the various departments.

**Figure 7.2**



Source: Ministry of Health, Directorate for Epidemiology and Disease Control.

The consumer associations, which should compensate for the chronic inadequacy of State structures by informing consumers about real foodstuff hazards are virtually ineffective. There is a consumer organisation in practically every major city, but the activities of these organisations lack visibility. Since they lack means (both human and financial), they are unable to play their vital role of informing the population and raising awareness. So, in these circumstances, just how aware are Moroccan consumers of the health problems posed by foodstuffs?

<sup>3</sup> FAO/WHO workshop on effective food control systems, Rome, 24 January 2005.

## **7.2 - Consumers and food risks in Morocco**

### ***7.2.1 - Methodology for evaluating consumer perception***

In order to evaluate consumer perception two one-to-one surveys (quota method) were carried out at an interval of one year (2004 and 2005) with two different, but complementary, objectives. The first survey aimed to determine the perception of the health risks entailed in food products by Moroccan consumers and passing tourists; it was conducted in 2004 and covered 200 inhabitants of Rabat and 100 tourists in Marrakech. The second objective was to determine the factors explaining a potential demand for quality marks on the part of Moroccan consumers and foreign residents. This survey was conducted in Rabat in 2005 and covered 200 Moroccan clients in the large-scale retail trade and 40 foreign residents. In the first survey, the products entailing a health hazard were selected on the basis of studies conducted by food experts and specialists. And the second survey involved a comparative crossing between the products on which consumers were consulted with regard to the affixing of a quality mark and the data of the Ministry of Health on products responsible for food-borne diseases. The city of Rabat was chosen because the level of education and awareness of food risks are higher there in relative terms than in other cities in the country. All results should therefore be revised downwards.

In the case of beef and veal, poultrymeat, bananas and honey the opinions of experts working on these issues in the Hassan II Institute of Agronomic and Veterinary Studies (Rabat) were taken into account. The other plant products were selected on the basis of discussions with officials in the Directorate for the Protection of Plant Products, Technical Control and Fraud Control (Ministry of Agriculture) and the analysis of data from statements filed and files forwarded to the Public Prosecution Department.

The products selected on the basis of the most probable types of contamination are set out in the following table.

**Table 7.3 – Real hazards entailed in the foodstuffs selected (expert opinion)**

<b>Foodstuffs selected</b>	<b>Type of contamination possible</b>	<b>Experts' perception</b>
<b>Industrial chickens</b>	Microbiological and chemical	Significant risks of residues of veterinary drugs such as nitrofurans (furaltadone and furazolidone) <sup>4</sup> and fluoroquinolons <sup>5</sup> Bacteriological salmonellosis problems
<b>Beef and veal</b>	Microbiological	Hygiene conditions. Defective transport and delivery system. Bacteriological quality with major gastro-enteritis-related <sup>6</sup> hazards Concern – as yet unconfirmed – with regard to cattle that was imported before the ESB crisis Risk of tuberculosis transmission
<b>Fish</b>	Microbiological	Freshness not ensured either because of interruption of the cold chain, faulty handling or fraud at market level.
<b>Milk</b>	Fraud without any known health effects	Fraud in the form of watering down or reconstitution during low lactation periods. In 1999, 68.5% of the samples taken by the fraud departments were found to be sub-standard. (The figure was 26% in 1991.)
<b>Apples</b>	Chemical	Treatment with antioxidants ("diphenylamine") to prevent the fruit from going brown when refrigerated, but also residues of pest control products in the fields where the crops are grown and at storage level. Residue problems
<b>Tinned fish</b>	Microbiological	Quality problems in the past (histamine, etc.) Quality improving because of export requirements
<b>Honey</b>	Chemical	Product subject to high levels of fraud (addition of sugar) + more recent problems of pest control residues and residues of antiparasitics and antibiotics used to treat certain bee diseases (in the case of modern beehives)
<b>Bananas</b>	Indirect health effects due to the deterioration of the ozone layer	Problem of soil nematode control treatment: methyl bromide, which has significant effects on the deterioration of the ozone layer and is due to be completely banned by the Montréal Protocol (already banned in Europe as of one in January 2005)

Source: Our interviews with experts and analyses of scientific documents.

<sup>4</sup> Cf. Results of the research programme launched by Prof. A. El Hraiki and the Ministry of Agriculture (National Laboratory for Veterinary Drug Control) on nitrofurans residues in poultrymeat products, 1997-2000.

On the effects of nitrofurans on human health: Information Bulletin no. 78 - Directive of the Swiss Federal Public Health Office: Nouvelles concentrations maximales pour les résidus de nitrofuranes dans les denrées alimentaires d'origine animale (New maximum concentrations for nitrofurans residues in foodstuffs of animal origin), Bern, 9 August 2002.

<sup>5</sup> A. El Hraiki (2005).

<sup>6</sup> Cohen N, Enaji H, Karaouane B, Karib H (2003).

### **7.2.2 - General perception of food quality**

#### **a) Perception of quality development:**

In the case of 5 of the 8 products selected on the basis of expert opinion, quality has developed favourably (poultry 60%, apples 57%, honey 58%, bananas 62% and milk 40%), whereas the quality of the other 3 products – fish, beef and veal and tinned fish – has been maintained. In the case of milk, consumers were divided as to how its quality was developing, 50% of the persons interviewed considering that the quality had deteriorated and 50% considering that it had improved.

**Table 7.4 – Moroccan consumers: perception of quality development**

<b>Commodity</b>	<b>Perception of the development of its quality</b>
Poultry	has improved (60%)
Apples	has improved (57%)
Honey	has improved (58%)
Bananas	has improved (62%)
Fish	has remained the same (47%)
Beef and veal	has remained the same (42%)
Tinned fish	has remained the same (42%)
<b>Milk</b>	has improved (40%) has deteriorated (37%)

Source: Data from the survey conducted by Mounir I (Rabat and Marrakech, 2004).

The tourists, on the other hand, said they enjoyed Moroccan products more after visiting Morocco: 53% of them enjoyed Moroccan products before visiting the country, and 80% said they enjoyed them after their visit. The proportion of persons who considered that the quality was average dropped from 45% to 18%. One thus observes a positive evolution in the tourists' perception of the quality of Moroccan food before and after their visit to Morocco. This positive perception is related in particular to the **organoleptic quality (taste)** of the products, which the tourists often cite as the main assessment criterion.

#### **b) The criteria used for evaluating a product's quality are its taste, its freshness and its composition:**

The inhabitants of Rabat judge the quality of a foodstuff on the basis of three main criteria: **taste** comes first (27% of the population), and this criterion is even more important for men. **Freshness and appearance** are the second criteria used. And finally, the **composition of the product** influences the judgement of 25% of consumers; it is a factor cited more often by graduates. The criteria used for assessing product quality of the products studied differ from one product to another and depend on socio-occupational category and age. Women seem to



attach more importance to the freshness of food. The higher the level of education the greater the importance attributed to information on the manufacturing of the product such as composition and food safety marking. Freshness, appearance and taste are the criteria more typical of citizens with lower sociocultural status.

Compared to the study conducted by CREDOC<sup>7</sup>, this work shows that Moroccans use the same criteria as the French to assess foodstuff quality, the only difference being the hierarchy, since **freshness** is more important for the French than **taste** and **composition**.

Thus the French, who have higher sociocultural status and live in a consumerist country with a developed agro-food sector, assess the quality of their foodstuffs according to the same criteria as Moroccans.

Whenever consumers are looking for a quality product, what they trust most is the **brand**, the “**use-before**” **date** and the **information on the composition** of the product.

The **brand** is the **primary criteria for choosing a quality product** for persons seeking food safety.

Tourists give precedence to **freshness and appearance** (20%); 17% of them choose the criterion of **local product** and 16% choose **taste**. They appreciate the organoleptic aspect but are suspicious regarding health aspects. They say nevertheless that they prefer national products and are particularly interested in fruit and vegetables.

What tourists are looking for is adventure, tradition, taste and the discovery of the local culture, and they favour traditional markets, the merchants on the famous “jama lafna” Square, and mid-range restaurants. Those who seek convenience, trustworthy products and quality tend more to shop in supermarkets and to frequent up-market restaurants.

The taste criterion is not assessed the same way by everyone, however. Contrary to Moroccans, who have no objective information on the real quality of products, tourists evaluate taste from a perspective based on a sound level of education and information and, ultimately, on “consumerist awareness”. When one considers the excessive use of artificial flavouring by the AFIs<sup>8</sup>, this would not be to the “taste” of the well-informed tourist, who is aware of the noxious effects of flavourings and seeks authentic natural flavours.

---

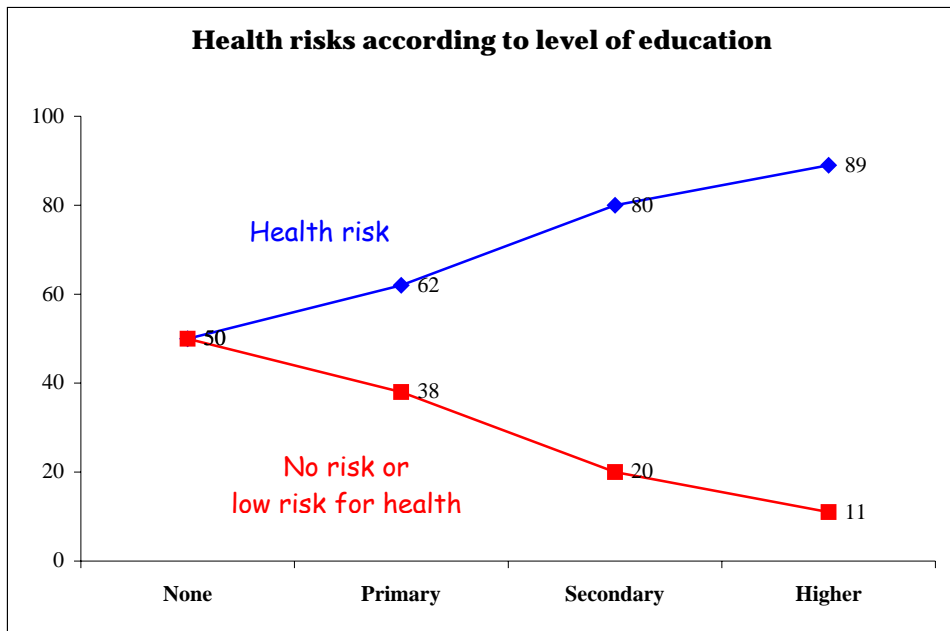
<sup>7</sup> CREDOC ([French] research centre for the study and observation of living conditions), « Les opinions des français sur la qualité et sur les risques sanitaires des produits alimentaires » (“The opinions of the French on the quality and health risks of foodstuffs”), April 1998.

<sup>8</sup> Ait El Mekki A, Gheris G, Hamimaz R, Rastoin J-L (2002), ONA, Prospective agro-alimentaire 2010 (Agro-food outlook 2010).

### 7.2.3 - The perception of food risks

The majority of the inhabitants of Rabat think that food products now present health risks: 80% believe this, and 48% even go as far as considering the risks “significant”. This phenomenon concerns all categories of the population. It is mainly consumers with a higher level of education who are more aware of these risks, since they are better informed than the rest of the population.

**Figure 7.3**



Source: Data from the survey conducted by Mounir I (Rabat and Marrakech, 2004).

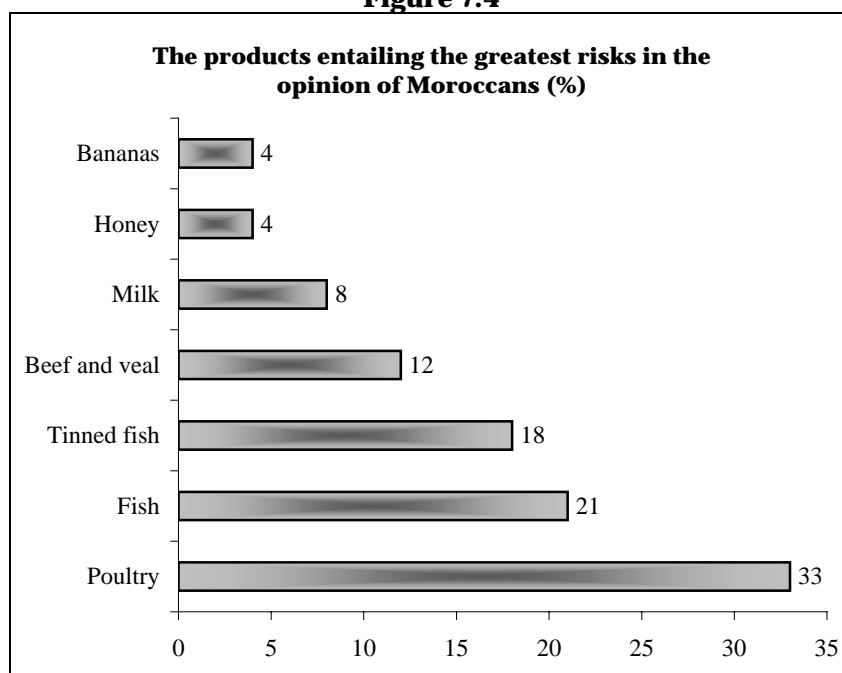
#### a) Tourists less perceptive of risks:

Tourists are less concerned than Moroccan consumers. One out of two tourists thinks that the foodstuffs available on the Moroccan market do not present any health hazards. It is to be noted, however, that 33% of tourists have already had health problems with Moroccan products, a fact which raises the question of the influence of this proportion on the non-return and satisfaction rates of tourists.

b) Comparative perception of food risks (2004 survey):

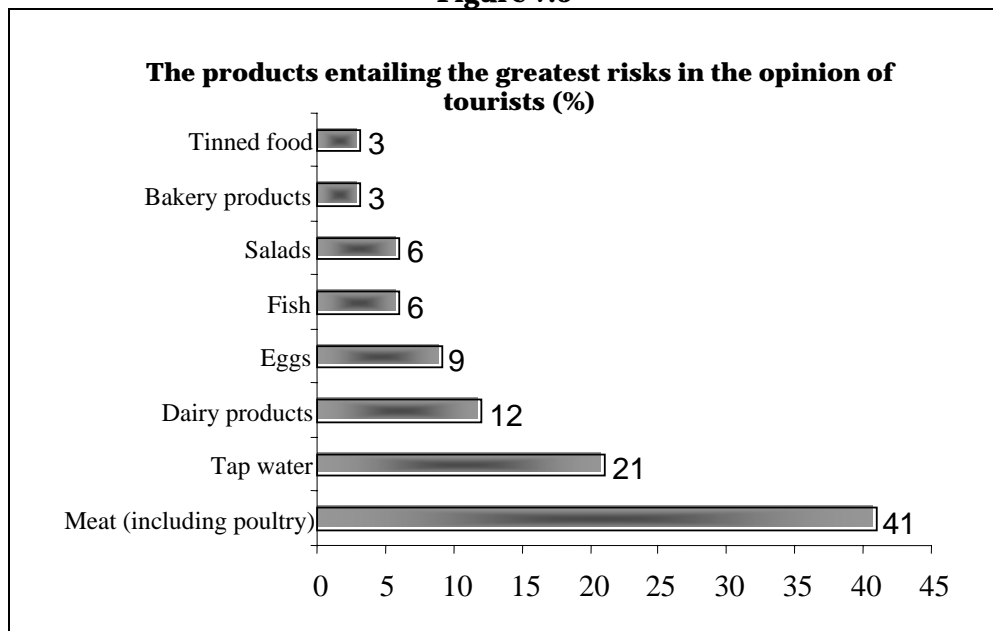
The surveys conducted in Rabat and Marrakech in 2004 demonstrated that meat, and in particular poultrymeat, are the products which worry consumers in the city of Rabat most. This opinion is shared absolutely not only by 41% of tourists but also by the experts interviewed, who recognise the high risk for consumer health presented by industrial chickens due to residues of veterinary drugs but also by fish “if it is not handled properly”. This apparent similarity can be deceptive since the real risk factors are not perceived at all. This apprehension is often to be explained in part by the information received through the media (on dioxin etc.).

**Figure 7.4**



Source: Data from the survey conducted by Mounir I (Rabat and Marrakech, 2004).

**Figure 7.5**



Source: Data from the survey conducted by Mounir I (Rabat and Marrakech, 2004).

Tourists cite tap water as a major hazard, but this is not the case with Moroccan consumers. Here again, information sources play an important role. In the “food” recommendations made to tourists in travel guides and other documents, tourists are advised to avoid drinking tap water and to drink mineral water instead<sup>9</sup>.

Expert opinions converge (Table 5), except on bananas and honey. The public at large is not yet aware of the problem of pest control residues. Very few Moroccan consumers and tourists can explain the effects of the substances used for treating nematodes (banana trees and other horticultural crops) on the ozone layer and thus indirectly on human health. Similarly, people are not particularly concerned about the quality of honey. The type of fraud to which this product is subject (addition of sugar) does not affect the health. Very few consumers are aware of the problem of pest control residues used on trees<sup>10</sup> on which bees gather pollen or of the residues of the antiparasitics and antibiotics used to treat certain bee diseases<sup>11</sup>. Moroccan

<sup>9</sup> See the web sites of two sources as different as the French Ministry of Foreign Affairs (advice for French nationals) and the “Guide du routard” (French backpacker’s guide).

<sup>10</sup> D. Belpomme, Les produits phytosanitaires et la santé humaine (Pest control products and human health), “l’Abeille de France” magazine (apicultural journal).

<sup>11</sup> Opinion of the French Food Safety Agency, to which a case of possible risk related to the presence of residues of tetracyclines and streptomycin in honey was referred by the Directorate General for

consumers do not have a high opinion of tinned fish, yet this is one of the products subject to the strictest quality controls due to export requirements and the considerable efforts made by the Moroccan canning industry to upgrade these products.

**Table 7.5 – Consumer perception compared with expert opinion**

<b>Commodities</b>	<b>What consumers think</b>	<b>Consumer assessment criterion</b>	<b>What the actual situation is</b>	<b>Expert opinion</b>	<b>Level of awareness of quality problems</b>
Poultry	Poor quality	Freshness, appearance, origin	Quality entailing risks	Residues of antibiotics	Very low as regards residues, average as regards hygiene
Fish	Average quality	Freshness, appearance, cold storage	Good quality (if properly handled)	Not properly handled, incidents of fraud	High
Beef and veal	Average quality	Freshness, food safety mark	Very average quality	Bacteriological risks related to hygiene	Very low
Milk	Average quality	Taste, freshness	Average quality	Fraud	Nil
Apples	Good quality	Freshness, taste	Average to good quality	Residue problems	Low
Tinned fish	Poor quality	"Use by" date, composition	Good quality	Export requirements	Nil
Honey	Average quality	Taste, origin	Average quality	Widespread fraud residues	Low
Bananas	Good quality	Taste, appearance	Average to good quality	Soil nematode treatment problems	Very low

Moroccan opinion is divided as to the development of the quality of some of the foodstuffs studied over the past 10 years: a large proportion of the persons interviewed considered that the quality of poultry, apples, honey and bananas had improved slightly, whereas that of fish, beef and veal and tinned fish had remained unchanged, the most controversial product in this respect being milk. In the case of meat, the above-mentioned sources agree unanimously that meat quality has

developed favourably despite the problems encountered by this product. According to the same sources, this improvement in quality also concerns tinned fish and milk. Honey is the only product whose quality has deteriorated due to the fraud to which it is subject.

As for tourists, before visiting the country they considered Moroccan foodstuffs to be of average quality. These opinions depend on sources of information such as travel agencies and tourist guides. This perception develops, however, once they visit the country, since more than 50% of tourists consider that the national products are of good quality. It is to be noted, however, that for a large proportion of tourists good quality is synonymous with good taste.

The results of a survey conducted on a representative sample of 200 Moroccan consumers and 40 foreign residents in Rabat in 2005 were fairly similar. The conclusions drawn in that study were compared with the data on food poisoning issued by the Ministry of Health.

d) Recorded instances of food poisoning and consumer perception (2005 survey):

In the case of foodstuffs entailing a health hazard Moroccans' perception is in keeping with the data on food poisoning. 26% of the persons interviewed cited dairy products and tinned fish. Chicken and red meat were cited by 23% and 16% of the interviewees respectively. Rabat consumers are much more suspicious of fruit and vegetables (13%), however, which is not the case with foreign consumers. Some of the incriminated products were not mentioned by Moroccan consumers.

In the foreign residents' opinion, the main products entailing a health hazard are red meat (22%), chicken (19%), dairy products (14%), fish (16%) and eggs (12%). These results tally with the data of the Directorate for Epidemiology and Disease Control on the products responsible for cases of food poisoning in 2003 and 2004. It should be noted, however, that some of the products identified (by the Ministry of Health) in food poisoning incidents – couscous, drinking water and snails – were not mentioned by the foreign consumers. On the other hand, foreign consumers are suspicious of products such as tinned fish (8%) and honey (2%), even though they are not included in the list of products incriminated in cases of food poisoning.

#### ***7.2.4 - Negative perception of quality control***

When asked directly to state their opinion of food control or regulations, consumers express distrust on the whole. The majority of the population questions Moroccan food regulations, 59% considering them to be inadequate. It must be noted, however, that 30% of the population does not know anything about those regulations.

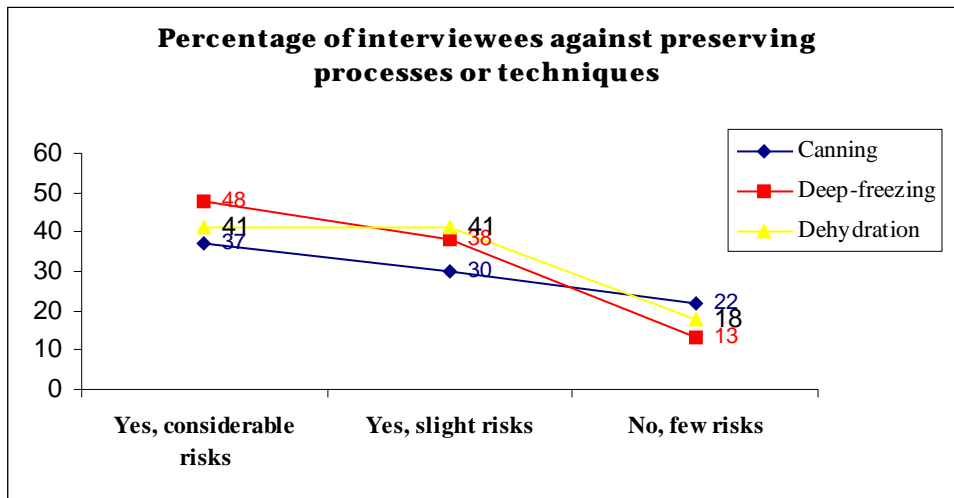
Control procedures are considered inadequate on the whole, irrespective of the stage of the food chain.

Inspections concerning the manufacturing of foodstuffs and sales points were severely criticised: 77% of the population consider that the inspections carried out at sales points are inadequate, whereas the figure for manufacturing inspections was 69%. As regards the inspection of imported products, 42% of the Moroccan interviewees stated that they did not have any opinion on these controls, and 49% considered them inadequate.

Moroccan consumers thus seem to be distrustful of the inspections carried out on the whole. This image has negative effects on the perception of the technologies used by the AFIs. The more concerned consumers are about quality control the more they are against new technologies.

- 75% of those who consider that food regulations are inadequate are of the opinion that foodstuffs present health hazards.
- 84% of those who consider that manufacturing inspections are inadequate are of the opinion that foodstuffs present health hazards, and 54% of this group consider that the risks are considerable.
- Similarly, 82% of those who consider inspections conducted at food sales points to be inadequate are of the opinion that foodstuffs entail a health hazard.
- And the situation is similar with regard to imported foods (84% of those who consider that import controls are inadequate are of the opinion that these products entail risks for consumer health).

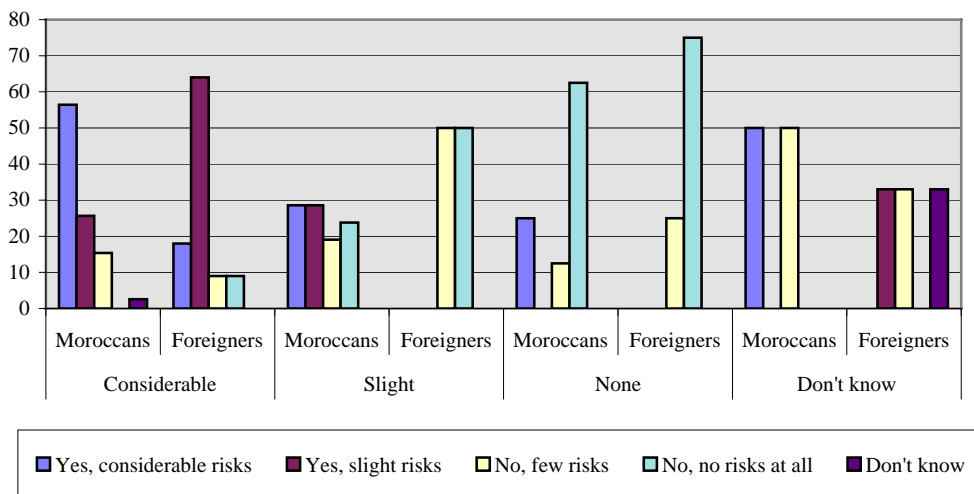
Here again, opinions on whether controls and regulations are adequate or inadequate are related to the attitudes adopted to new technologies.

**Figure 7.6**

### 7.3 - Food risks and quality marks

a) The demand for quality marks depends on the perception of health risks:

**Figure 7.7 - The demand for quality marks taking account of the perception of health risks**



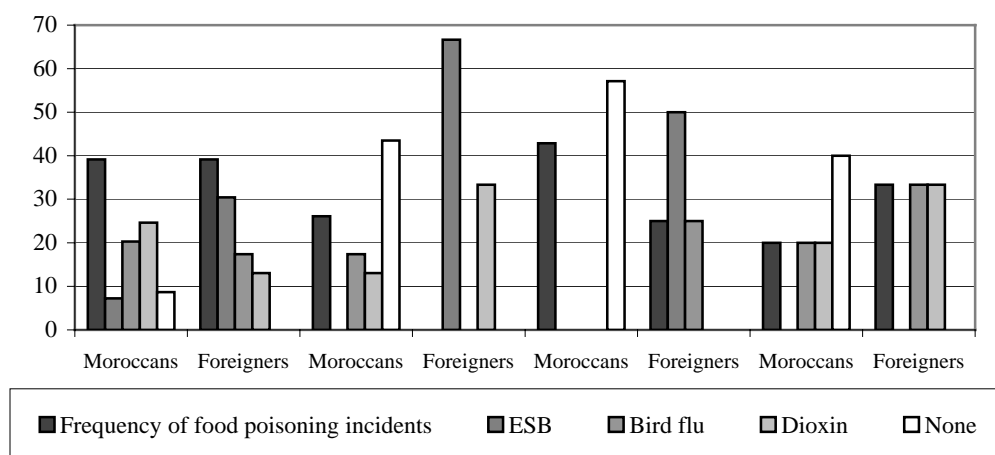
Source: surveys conducted by El Baz F (city of Rabat, 2005).



In the case of both Moroccan consumers and foreign residents, the perception of the role played by quality marks in improving food quality is closely related to the risks entailed in foodstuffs. For approximately 80% of the Moroccan and foreign interviewees who attach great importance to quality marks consider that foodstuffs present slight to considerable risks. However, 63% of the Moroccan interviewees and 75% of the foreigners who do not attach importance to quality marks consider that foodstuffs present no risks whatever.

b) The demand for quality marks depends on the influence of food crises:

**Figure 7.8 - The demand for quality marks and food crises**



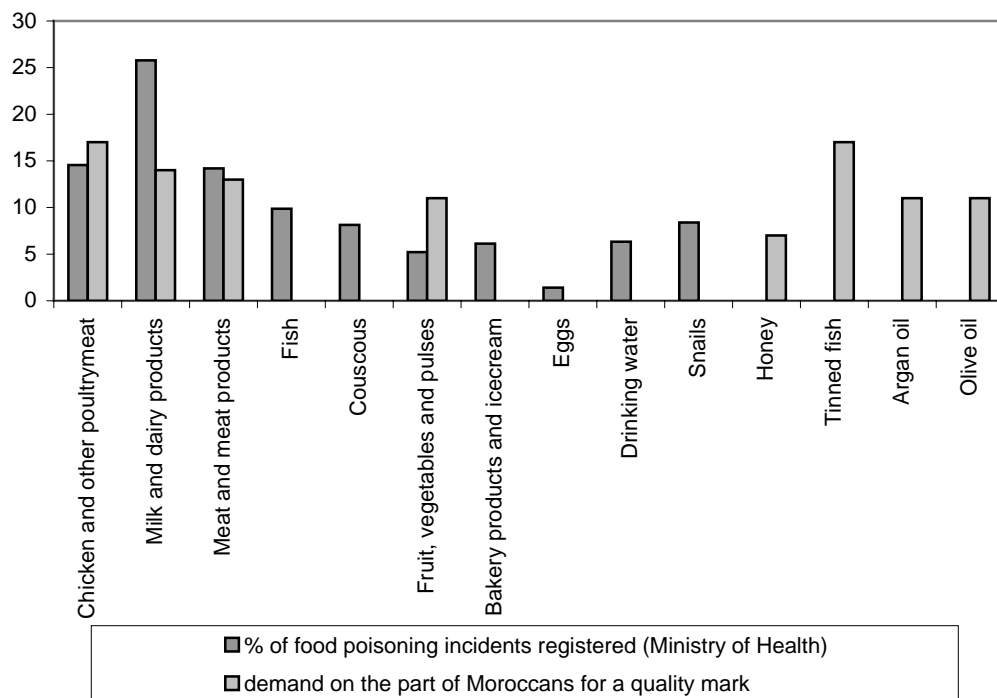
Source: surveys conducted by El Baz F (city of Rabat, 2005).

Most of the Moroccan interviewees who said that they attached importance to foodstuff certification were influenced by the recent crises in the agro-food sector (at both the national and the international level) such as the frequency of food poisoning incidents (39%), dioxin chickens (25%), and bird flu (20%). However, 57% of the Moroccan interviewees who said they attached no importance to quality marks also said that they were not influenced by food crises.

Although the foreign consumers said they were very concerned about the food crises, this factor nevertheless did not seem to influence their demand for quality marks.

c) Quality marks for the products incriminated in food poisoning incidents:

**Figure 7.9 – Food poisoning incidents recorded and Moroccan demand regarding the products requiring quality marks**



Source: Surveys conducted by El Baz F (city of Rabat, 2005) and data on food-borne diseases provided by the Ministry of Health.

Moroccan consumer demand for the certification of certain foodstuffs is closely linked to the frequency of food poisoning involving those products. Chicken (17%), dairy products (14%), and red meat (12%) are in fact the principal foods for which Moroccan consumers are calling for certification; these products have been incriminated in numerous cases of food poisoning. Tinned fish was cited by a considerable proportion of the interviewees (17%) despite the fact that it does not in fact constitute any real health hazard; this can perhaps be explained by inadequate perception.

As for the products which have not been incriminated in food poisoning incidents such as olive oil or argan oil, there could be other valid reasons explaining the demand for certification such as the need to safeguard the authenticity of these oils or to protect them against the fraud to which they are often subject (sale in bulk, etc.).

The foreign consumers also called for certification of certain foodstuffs incriminated in numerous cases of food poisoning such as dairy products (16%), red meat (21%), fish (16%) and chicken (17%). As was the case with the Moroccan consumers, the foreign interviewees mentioned products which, according to Ministry of Health data, have not been identified as major sources of food poisoning. The reasons may be connected with the desire to upgrade a local product by giving it a designation of origin (as is the case with honey, argan oil and olive oil), the fraud to which products of this nature are subject or, lastly, the influence of certain foreign media (in the case of snails).

## **7.4 - Conclusions**

In a national environment marked by the absence of preventive and monitoring structures and structures for consumer information and education, consumers (and in the case of Rabat they are relatively "well-educated") perceive risks through a prism of information on international problems that are given wide media coverage or of food poisoning rumours. Since these consumers base their opinions mainly on criteria such as freshness, taste and appearance in order to evaluate the quality of foods, they do not always perceive the real risks involved. Even if the opinions expressed on products entailing health hazards sometimes tally with expert opinion, the reasons given are not the same. This is the case, for example, with industrial chicken, on which beliefs are formed that are fostered by the dioxin and bird flu problems discussed on satellite TV. The experts, on the other hand, place more emphasis on residues of veterinary drugs.

Other products are perceived as entailing health hazards, whereas this is not in fact the case. This applies to tinned fish, whose quality and safety has improved as the result of export requirements. This is a case where Moroccan consumers base their opinion on beliefs and rumours which have not been confirmed.

Consumers' loss of confidence in the quality monitoring structures that are intended to protect them has repercussions not only on their perception of foodstuffs but also on their perception of the technological processes used in the processing industry such as dehydration or deep-freezing.

The 2005 survey demonstrated that the products that had been incriminated in food-borne diseases were relatively well perceived, a fact which can be explained by experience and information by word of mouth. But the data on food poisoning incidents do not take account of all of the cases of chemical contamination such as residues because this type of contamination is propagated very slowly. It is only cases of food poisoning that are due to lack of hygiene in the preparation, transport and preserving of foodstuffs or to the excessive use of pesticides and are thus more spectacular which are consequently more easily identified and registered. Tourists and foreign residents, who are more aware of food problems, are influenced by

information from tourist guides or other more "official" recommendations. Their attitudes become more positive after their stay in the country, the taste of the local food being one of the major culinary discoveries.

The desire to be "reassured" by labels and quality marks or, as the case may be, "safe investments" such as the reputation of a brand that is supposed to diminish doubts is no doubt to be explained by the fact that people perceive the risks but are unable to identify them exactly.

The reasoning is clear. The only way to have a favourable impact on the national agro-food system is to provide several forms of information (education, awareness raising, knowledge, etc.) in particular by developing a strict system of quality marks, by encouraging and supporting consumer associations and thus enabling them to play an effective role, and by stimulating prevention and control structures within the framework of one single body. This information would reassure consumers and develop their knowledge thereby reducing unwarranted doubts, creating real opportunities for competitive new quality products, and contributing to the development of tourist loyalty and the preservation of the tourist market, on which considerable efforts are being focused.

## ***8 The development of products protecting the health and the environment in the Mediterranean region***

The term "health" products is classically used to denote health-enhancing foods or functional foods. Yet in 2004 there was still no legal definition for "functional foods" in Europe. World regulations classify these products between foodstuffs and drugs. Probiotic or prebiotic milk products<sup>1</sup> F1 and vitamin and mineral-enriched foods are well-known examples in Europe and North America (El-Dahr, 2003). Although organic products are by definition "environment" products<sup>2</sup> by virtue of the methods employed to produce them, the vast majority of consumers buy them mainly as foods that are "better" for the health.

Certain products known as "hydroponic" products could also be classed in the same "environment" category; they are produced in soilless cultures in which inputs are very accurately controlled and the irrigation water is recycled.

### **8.1 - The health-enhancing food market**

In the following section we shall examine the evolution of the health food market in the major countries of the northern Mediterranean region, in particular France, which has followed this trend in its own specific way while keeping an eye on the prospects for developing the market in the southern Mediterranean countries.

#### ***8.1.1 - Emergence of the market***

The concept of health food or health-enhancing food is currently developing in Europe after emerging in Eastern Asia, and more specifically in Japan in 1984 (Le monde alimentaire, 1999). The Americans subsequently took over in this sector, becoming the world leader of a market estimated at US\$156 billion<sup>3</sup> (cited by Kitous, 2003). This new generation of products has now hit the European market, particularly in France, with the emergence of health foods or health-enhancing foods. The French term denoting such foods ("aliments") is a contraction of the French word for "food" and the French word for "medicine", and these products contain a "health" component and differ from conventional foods by the properties

---

<sup>1</sup> Pro-biotics: "good bacteria" that are found in the intestine. These bacteria help the body to digest proteins and contribute to good bowel health.

Pre-biotics : the precursors of "good digestive bacteria", which nourish those bacteria and help them to develop normally.

Source : [http://www.nutri-site.com/dossiers/index\\_probiotique.htm](http://www.nutri-site.com/dossiers/index_probiotique.htm)

<sup>2</sup> "Environment" products: products that are produced by methods which are ecologically favourable for the environment and ecosystems.

<sup>3</sup> Including organic foods, plants and herbal supplements, oral cosmetics and medical foods.

which assimilate them more to medicine or drugs in addition to their basic nutritional input.

Approaches differ widely between western countries and Japan in the perception and marketing of health-enhancing foods. The Japanese regard these products as a class of food in their own right, a category which received a label in 1991 denoting them as food of special health uses - "FOSHU"<sup>4</sup>, whereas in western countries they are classed in the same category as other foods. Vested with scientific names – functional foods, nutraceuticals, pharmafoods, cosmeto-foods, etc. –, the market of these new products is expanding rapidly in industrialised countries and, more recently in emerging countries (Eastern Europe, etc.). The launching of health foods has been so successful that the market has become a contest between the agro-food industry and the pharmaceutical industry, to the extent that the regulation of these products, particularly in Europe, has fallen into a grey area between foodstuffs and drugs.

### **8.1.2 - Evolution of the market**

Despite the difficulties encountered in the delimitation of the sectoral perimeter of the health food market, supply was estimated at €23 billion in 2003 according to the figures of the Canadian government, with a share of between 10% and 50% for the various health ingredients and a growth rate of 12% to 15% per year. It is in fact consumer interest in health that has been the mainspring of the growth on food markets. The food categories registering the most rapid growth in 2004 were those of health foods, for instance. The study conducted by A.C. Nielsen in 2004 on the evolution of the agro-food markets<sup>5</sup> shows that 75% of the 24 most dynamic food categories contain a health component. Furthermore, of the seven leading categories classed as registering the most rapid development in 2003 and 2004 six are perceived by consumers as being related to health and special diets (Table 1). And 12 of the remaining 17 categories (which have annual growth rates of +6% to +9%) are also associated with a healthy diet.

---

<sup>4</sup> Food of Special Health Use. This term replaces the term "functional foods". FOSHUs are a subcategory of foods for special dietary use for which provision is made in the Food Hygiene Improvement Act.

<sup>5</sup> The study covers 89 food categories and 59 countries in the continents of North and South America, Asia and Europe (including Mediterranean countries such as France, Italy, Greece, Spain and Turkey) and emerging countries in Eastern Europe, Egypt and Morocco.

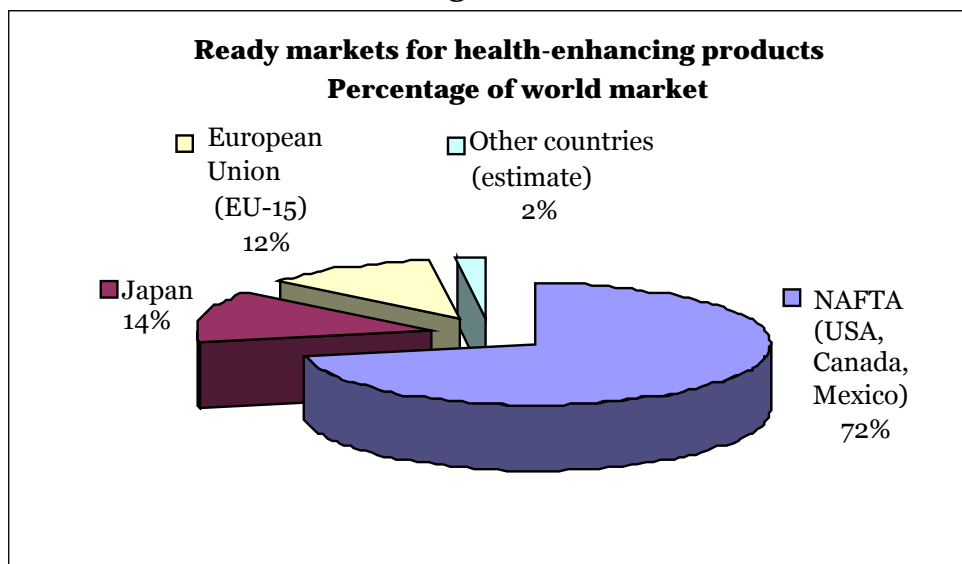
**Table 8.1 - Six of the seven food categories registering the highest growth rates at world level in the "health" line**

PRODUCT	CATEGORY	Growth rate 2003-2004	Growth in value (€ million)
Soybean beverages	Soft drinks	31%	244
Yogurt beverages	Soft drinks	19%	655
Eggs	Meat, fish and eggs	16%	802
Cereals, muesli, fruit bars	Confectionery and snacks	14%	314
Energy and sports beverages	Soft drinks	10%	438
Sugar substitutes	Staple foods	10%	77

Source: A.C. Nielsen (2004).

Seen in the world perspective, certain countries are well ahead of the others, offering substantial market outlets for health products. **Europe** is currently lagging behind compared to the dynamism of the Americans and the Japanese, although studies have revealed that several European States have real potential for the years that lie ahead. The most recent figures show that in 2000 the European market (15 countries) was estimated at US\$30 million, i.e. 12% of the world market (Figure 1). Europe's backwardness in the field of health-enhancing foods compared to the other continents is to be explained first of all by the reluctance of legislators to use health claims in order to market products but also by the cultural disparities amongst the member states, which influence food consumption habits. Due to the combined effects of local traditions and the tastes of their various populations, southern European countries prove to be more conservative than the Nordic countries, where the progress made in the nutritional research field is a favourable factor. The Danish, Finnish and Swedish governments encourage industrialists to draw up scientific reports validating the health claims they make about their products. At a time when the incidence of cardiovascular risk is five times higher in Finland and Italy (in view of the excessive consumption of saturated milk fats), two-thirds of European research projects are run under the aegis of the countries of the North including the Netherlands and the United Kingdom, to the detriment of the countries of the South (Kitous, 2003). Germany, for example, was for many years the leader in the sale of functional products in Europe, surpassing France, Italy and Spain by far.

**Figure 8.1**



Source: Leatherhead and Elizabeth Sloan, Trends & Solutions, Health Ingredients Europe, Frankfurt (2000); cited by Kitous (2003).

The **southern European** countries armed themselves with their famous "Mediterranean diet" for many years as a protection against certain types of illness. However, as health problems have developed with changing lifestyles and health budgets have reached saturation point governments have been forced to define public health policies focusing on prevention (such as the PNNS<sup>6</sup> in France). The health-enhancing food market has excellent prospects in this context. The lack of harmonisation of regulations amongst the member states remains the main constraint on the marketing of health foods, however. Industrialists in each country are meanwhile endeavouring to implement marketing strategies that are adapted to their specific national context until new legislation is passed. **Spain** is trying to follow the example of the Nordic countries, for instance, by establishing charters of good conduct. In **Italy**, any health-enhancing food can be produced and exported to the member states of the European Union (Kitous, 2003). Until 1999, no legal definition had yet been laid down in either of these two countries (Italy and Spain) concerning health claims (DG SANCO<sup>7</sup>, 2000). As for **France**, inertia in the field of regulations remains a powerful factor of conservatism with regard to the marketing of products alleged to enhance the health, even though 10% of the products launched on the food market since 1997 are in the health and fitness line (RIA, 2002).

<sup>6</sup> 5-year National Nutrition and Health Programme launched officially in 2001.

<sup>7</sup> Directorate General for Health and Consumer Affairs.



### 8.1.3 - The health-enhancing food market in France

Following the various reports which have clearly hailed the emergence of a fundamental trend in the health food sector, French industrialists have realised that the main challenge is to innovate in order to meet the steadily growing demand in the sector. For 82% of the French and 76% of Europeans now agree that the diet contributes (or should contribute) to improving one's state of health (RISC survey, 1999). It should be pointed out that the number of persons who shared the opinion that "a healthy diet is the best medicine" was larger in the southern European countries such as France, Italy and Spain, compared to Germany and the United Kingdom (Table 2).

**Table 8.2 - "In my opinion, a healthy diet is the best medicine"**

%	EU	France	Germany	Italy	Spain	United Kingdom
absolutely	38	41	27	4	42	30
agree more or less	38	41	43	4	43	30
<b>total</b>	<b>76</b>	<b>82</b>	<b>70</b>	<b>9</b>	<b>85</b>	<b>60</b>

Source: R.I.S.C. survey<sup>8</sup>, cited by Antoine (1998).

The greater majority of French consumers nevertheless seem to watch their diet – not in terms of quantity (the share of food in total household consumption dropped by more than 50% in the period from 1960 to 2000 [INSEE<sup>9</sup>, 2000]), but in terms of quality. At the same time, the family budget devoted to (non-food) "health, beauty, fitness" is steadily increasing: +58% between 1970 and 1990 (INSEE cited by Guillon and Willequet, 2002). Per capita consumption of "health and fitness" foods increased sixfold in volume in the period from 1960 to 2001. In this context, at a time when 5% of health expenditure is spent on inappropriate diets (Grenier et al., 2002), the French are tending more and more to consume products which guarantee a certain balance and well-being. The annual growth rate in the consumption of health foods has thus been evaluated at +3% to +20% depending on the segments studied. These values are much higher than the average annual growth rate in per capita food consumption, which is evaluated in France at +1.6% in terms of volume (INSEE, 2002).

Despite the profusion of products on the market, France has in fact remained a consumer country in the health-enhancing food sector in the past few years rather than a producer, for the share of French industry in this sector is still limited (apart from the role played by certain actors such as Danone). The health-enhancing foodstuff market in France was estimated at US\$3.6 billion in 2000, i.e. 2% of the

<sup>8</sup> Research Institute on Social Change.

<sup>9</sup> National Institute of Statistics and Economic Research, France.

world market, with relatively low per capita consumption compared to other developed countries (US\$63 per capita per year compared to US\$438 in NAFTA countries) (Table 3). According to a Eurostat survey, France already accounted for 20% of European sales in 2003 at a value of over €5 billion, almost level with the United Kingdom (18%), but lagging far behind Germany (39%) (Eurasanté, 2005).

**Table 8.3 - Estimation of per capita health-enhancing food consumption (in 2000)**

<b>Country or region of the world</b>	<b>Market \$ billion</b>	<b>World</b>	<b>Population million</b>	<b>Annual consumption \$ per capita</b>
NAFTA (US, Canada, Mexico)	175	72	400	438
Japan	35	14	120	291
European Union (EU-15)	30	12	380	79
of which France	3.6	2	60	63
Other countries (estimate)	10	2	4 100	2.5
<b>TOTAL</b>	<b>250</b>	<b>100</b>	<b>5 000</b>	<b>48</b>

Source: Leatherhead and Elizabeth Sloan, Trends & Solutions, 2000 (data supplemented by Kitous, 2003).

However, in order to estimate this market some authors have tried to delimit its boundaries using a "restricted perimeter" (Guillon & Willequet, 2002), which is defined by dietary foods, food supplements and functional foods, these products being in principle the subject of scientific reports proving their effectiveness on the specific body functions. According to the authors, other categories of food can be added to the restricted perimeter such as diet foods and enriched foods, organically produced products, fruit and vegetables, sugar and fat substitutes, etc. This is then referred to as the "broader perimeter" of health foods, which can be up to 10 times as large as the restricted perimeter and can amount to up to one-third of total food (Arts-Chiss & Guillon, 2003).

In France, the value of the health food market defined by the restricted perimeter was €1.4 billion in 2000 with a penetration rate of 1.1% compared to the home food market (Guillon & Willequet, 2002).

Others have endeavoured to assess the French health-enhancing food market within the broader perimeter by including products which are presented to consumers with an argument of health benefit. According to these estimates the market value was over €5 billion in 2000, thus amounting to 3% to 5% of the value of the food and drug markets (Kitous, 2003). The 10 segments included in these estimations are as follows:

- diet foods and enriched foods
- organically produced products

- food supplements, nutritional pharmaceuticals and self-medication foods
- dietetics
- “good form – fitness – slimming” products
- liquids and waters (for which functional claims are made)
- novel foods (new products in the health ingredient field)
- recommended remedies (unregistered specialities such as homoeopathic products)
- herbal therapy products
- cosmeto-foods (oral cosmetics).

Whatever the estimates of the size of the market in France, the functional food segment is still one of the most dynamic health food segments. A functional food is by definition similar in appearance to a traditional food but, according to Professor Robertfroid (1996), it contains a (nutritive or non-nutritive) ingredient which specifically affects one or several body functions with a view to obtaining favourable effects which can justify functional (physiological) claims or even health claims).<sup>10</sup>

France ranks second in Europe as regards the sale of functional foods (with a value of US\$336 million) when only products whose labelling or publicity explicitly mentions a health advantage are taken into account (Leatherhead Food RA, cited by Inter/Sect Alliance, 2001). The largest European market is in Germany with a value of US\$406 million. France is closely followed by the United Kingdom with a total of US\$285 million. When one uses a broader definition covering products ranking or perceived as functional foods (even if their manufacturers do not make any specific health allegation), France ranks third and after the United Kingdom and Germany, with a total sales value of US\$907 million (Hillian, 1999 cited by Inter/Sect Alliance, 2001). These products include in particular enriched milks, energy beverages and beverages for sportspeople, spreads, breads, vitamin-enriched sweets and sugar-free chewing gum.

There are two families of products in the functional product category which register a growth rate of 50% in France: probiotic yoghurts and low-cholesterol margarines (Guillon & Willequet, 2002). Functional dairy products account for a considerable share of health-enhancing food sales in France (45% in northern Europe). Whereas the share of dairy products in total sales in France is still low – less than 10% –, enrichment processes and the addition of live and prebiotic cultures have enabled manufacturers to thwart stagnation in the milk sector.

Two other categories – high-fibre breakfast cereals and diet biscuits – are developing just as rapidly as dairy specialities.

---

<sup>10</sup> According to CNERNA/CNRS Director Gérard Pascal, since there is no global agreement on the definition of “functional food”, the European meaning of this term could be that proposed by Prof. M. Robertfroid (Catholic University of Louvain).

### **8.1.4 - Health food demand at the European level**

Although the European health food markets still lack maturity compared to their American and Japanese competitors, the combined effects of growing consumer expectations, public incentives and the role played by industrialists are helping this sector to gradually catch up and develop.

In fact the demand data show that the potential of the European consumer market is considerable for a variety of reasons:

- The growing awareness of the need for a healthier diet in a western society where food is abundant; the fact that in its 2003 report, the WHO clearly stressed the influence of diet as a risk factor and a factor for preventing disease.
- The increase in the number of women in employment, the decrease in the size of the family unit and the development of away-from-home catering; the fact that meals are becoming less structured and that people are tending more to eat snacks or other forms of fast food; the fact that the consumption of processed products is steadily growing in the diet of most Europeans.
- The ageing of a population that is anxious to keep as fit and healthy as possible. By 2025 eight of the ten "oldest" populations in the world will be in Europe – i.e. Europe will have the highest percentage of people over 60 years of age, of whom there will be at least 10 million. It is estimated that by 2050 35% of the European population will be over 60 years of age, compared to 20% at the present time (Eurasanté, 2005).
- The increase in health expenditure: according to OECD projections, an ageing European population entails higher health and long-term care costs, which would increase from the current 6% of GDP to 9% by 2040. In this context of increasing longevity, the development of certain illnesses which are highly disabling and considerably impair people's quality of life is a matter of particular concern. Multifactorial illnesses are the primary illnesses concerned in this context, particularly those related to diet. Obesity accounts for 5% of public health expenditure in the world at the present time and concerns 10% of the French population.
- The increase in the number of food crises – mad cow disease, listeriosis, dioxin, etc. – has greatly affected consumers in the various countries, who say that they are concerned about the advent of GMO-based foodstuffs and seek above all products which are reassuring and have "health" virtues.
- The emergence of a new clientele of young women who are obsessed with body hygiene brings the prospect of expansion of the market of certain types of health-enhancing foods such as cosmeeto-foods.

### **8.1.5 - Health supply opportunities**

The government indecision which is reflected in the lack of a sufficiently concise definition of health foods, particularly in the South (of Europe and around the Mediterranean), has not impeded the development of the health food market. Industrialists in these countries have found a new outlet for diversifying their products by means of a new form of supply without falling into the pharmaceuticals trap<sup>11</sup>. So why venture into this field and how can the new consumer expectations be fulfilled?

In a virtually deflationary context where margins have dwindled, firms compete on both prices and innovation by developing in new market niches, which they see as growth areas. Foodstuffs with a strong “health” image are a source of differentiation and profitability in certain agro-food branches where there is marked stagnation, such as the milk sector. In their pursuit of value added industrialists have used the health argument to segment their products: the value added rate for dietary products, for example, is one of the highest in the agro-food industries (over 20%), whereas the rates registered in milk processing are low (13% on average in France as a whole, according to Agreste, 2004).

However, since the key to success on the health-enhancing food market is innovation, the barriers to market access are formidable for agro-food industrialists. For the segments which product supply has to fit are becoming increasingly narrow, and this leads to highly developed product segmentation with a view to meeting the rigorous expectations regarding health. In order to satisfy this demand the agro-food industries (AFIs) are forced to specialise to a very great extent and thus to effect very costly physical and intangible investments. Research and development (R&D) and communication mobilise large sums in connection with the high-tech aspect of their products. In order to innovate they thus have to achieve the critical size in relation to the target market, which is very dependent on the spin-offs of technological advancement.

In developed countries only large firms are in a position to allocate resources to R&D. Small and medium-sized enterprises (SME) and small enterprises in less industrialised countries have a low or zero investment rate compared to the rate observed in the countries of the North.

In this context, the AFIs have to adopt lines of strategy such as collaboration with pharmaceutical firms through partnership operations (mergers and takeovers) with a view to ensuring growth in both areas. The supremacy of the pharmaceutical

---

<sup>11</sup> In Europe, subject to provisions applicable to foodstuffs intended for a specific purpose, food labels must not list properties preventing, treating and/or curing a human disease or mention such properties. Claims which mention a connection between a substance and a health-related state without referring to an illness are allowed, on the other hand. A label may thus contain a statement such as “calcium improves bone density”, whereas statements such as “calcium prevents osteoporosis” are prohibited.

industry in these collaboration operations is due to its higher research potential and its close links with the medical world. But the AFIs have the advantage of knowledge of consumers and mass marketing and of conserving the “pleasure” aspect in health foods.

A new avenue is thus opening to firms in the South, and in particular to those in the southern Mediterranean countries, through partnership between agricultural suppliers and the agro-food industry. By capitalising on the functional properties of agricultural raw materials from the countries in the South the AFIs can now find new outlets for growth by developing health foods with a high value added. Contributing to the production of functional foods is a new challenge for agriculture in the countries of the South where the wealth of flora can be a major source of high-quality functional ingredients. This expanding market is opening to innovating actors who are capable of working together as mutually supportive players and can demonstrate the legitimacy of this new market niche.

## **8.2 - The organic and hydroponic product market**

### ***8.2.1 - Description and concepts***

#### **8.2.1.1 - Organic products**

##### ***i) Definitions of organic farming:***

There are several definitions of organic farming which vary in their degree of detail (Codex Alimentarius: [www.codexalimentarius.net](http://www.codexalimentarius.net), IFOAM standards: [www.ifoam.org](http://www.ifoam.org), etc.).

Organic agriculture is defined first and foremost as a method of crop and animal husbandry which is practised in harmony with nature. The value of an organic product is thus related to the set of principles governing its production. Contrary to what is often thought, organic agriculture is not a simplistic form of farming: very elaborate techniques are actually used.

Let us explain the fundamental principles of organic agriculture.

The Codex Alimentarius describes organic agriculture as: “a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. The philosophy of organic agriculture is to take account of the interdependence of soil, plant, animal and human life.” It is a form of agriculture based on specific and precise crop and animal husbandry methods that are based mainly on the total banishment of all synthetic inputs in cultivation (such as pesticides, chemical fertilisers, antibiotics, genetically modified organisms, etc.) and observance of procedures

such as the treatment of animals and the space allocated to them (Codex Alimentarius, 1999).

For all organic crops the organic farming specifications thus require that any use of synthetic chemicals (pesticides, weedkillers, fungicides, fertilisers, etc.) be totally prohibited. Only natural fertilisers, green (grass-based) manure crops, compost and dung are allowed. Crop rotation and constant tilling are needed in order to control parasites, diseases and weeds.

At the international level organic farming has been part of the guidelines of the Codex Alimentarius for plants since 1999 and for animals since 2001. Private framework rules have furthermore been decreed by the IFOAM (International Federation of Organic Farming Movements) since 1980 and are regularly revised.

The European regulations to which organic agriculture is subject also provides that “No claim may be made on the label or advertising material that suggests to the purchaser that the indication shown in Annex V constitutes a guarantee of superior organoleptic, nutritional or salubrious quality.” (amended Art. 10, §2 of Regulation EEC/2092/91).

*ii) General presentation of organic agricultural production in the Mediterranean region:*

There are considerable differences between the Euro-Mediterranean and the other Mediterranean countries as regards the history and development of the application of the organic farming concept. Organic agriculture actually emerged in the Euro-Mediterranean countries 20 years before it began to develop in their southern counterparts. In addition, there is a considerable difference in production area between the two shores of the Mediterranean (the northern countries account for 93% of production).

Due to the excessive use of synthetic chemicals in conventional agriculture in the second half of the 20<sup>th</sup> century in order to considerably increase food production, one of the major objectives to be pursued is to identify sustainable methods of farming the land in order to limit the degradation of natural resources as well as the destruction of the rural environment and biodiversity. Soil management using the concept of organic agriculture can be a sustainable development model. However, the application of this production method requires additional knowledge in terms of technique, agronomy, legislation and the state of the market if farmers are to be able to produce and sell on the market in accordance with the rules imposed by the certification and control system (Fersino and Petruzzella, 2002). It was thus pointed out at the international colloquium on organic agriculture in the Mediterranean region (Agadir, Morocco, October 2001) that action must be taken to support the development of the organic sector such as measures(a) to establish specific rules for control and certification in the southern Mediterranean countries;(b) to train technicians; (c) to disseminate information; (d) to step up

research and (e) to develop markets, particularly local markets (Fersino et Petruzzella, 2002).

In short, the definition of organic agriculture as construed by international organisations seems to be based essentially on production methods (standards) and the environmental advantages of this type of farming. However, this conception of organic farming is not exactly shared by consumers in general, since the main reason for purchasing organic products is still the “health” argument (Agence Bio, 2004). Furthermore, it is also to be presumed that consumer perception of organic products varies from one Mediterranean country to another, and more specifically from Euro-Mediterranean to other Mediterranean countries, in view of differences in culture, eating habits, living standards, etc.

#### 8.2.1.2 - Hydroponic products

##### *i) Description of hydroponics:*

Soilless cultures are also known as “hydroponic cultures”. They are classed in two categories:

- (a) Solution cultures (true hydroponic culture), where the nutritive solution is recirculated after re-aeration and adjustment of the pH and nutrient levels (closed systems); an example is the NFT (Nutrient Film Technique) system: [www.nutriculture.com](http://www.nutriculture.com).
- (b) Substrate cultures, where the nutritive solution is supplied to the plants via a special irrigation system and excess solution is either directly eliminated (open system) or recirculated; examples of this method are perlite culture, sand culture, gravel culture, coconut coir culture, etc. (Olympios, 2002).



**Table 8.4 – Description of hydroponic growing systems**

Solution culture (true hydroponic method)	Aggregate systems		
	Inorganic (“hydroponic”) medium		Organic medium
	Natural medium	Synthetic medium	
Static solution Circulating solution ‘Aeroponics’	sand, gravel rockwool glass wool perlite vermiculite pumice	(PUR) foam mat “Oasis” (plastic foam) hydrogel	sawdust, bark chips wood shavings peat, fleece pulp coconut coir

Source: Olympos, 2002 (CIHEAM, 2002).

**Table 8.5 – Distribution of the use of hydroponic production systems**

System categories	System	Percentage of the use of the system in industry
Solution culture	NFT	5%
	water culture (Gericke system)	3%
	gravel culture	1%
	<b>Subtotal</b>	9%
Substrate culture	rockwool (rock medium: inorganic medium)	57%
	other inorganic media	22%
	organic media	12%
	<b>Subtotal</b>	91%

Source: Donnan, 1998 (modified).

Hydroponic culture is seen as a very efficient method for supplying water and nutrients to cultures. Crops develop more rapidly when the roots are given a balanced supply of water, nutrients and oxygen. Crop density and yields per unit of area can be increased with more rapid crop rotation (Cooper, 1979).

Most hydroponic greenhouses in the region have a fairly simple structure: they are covered with plastic sheeting and equipped with relatively simple irrigation technologies and systems for controlling the cultivation environment. These systems are chosen to a large extent in view of the low cost of this type of greenhouse due to the specific features of the Mediterranean climate.

## **8.2.2 - Estimation of the size of the health and environment product market in the Mediterranean region: products and produce destinations**

### **8.2.2.1 - Organic products**

The present section aims essentially to present organic agricultural production as a whole in Mediterranean countries and to identify the differences in production between the Euro-Mediterranean countries and the other Mediterranean countries. To do so we have selected the most recent information available, but despite our efforts to be precise some of the information is relatively dated and must be interpreted and used with precaution.

**Table 8.6 – Summary of organic production in Mediterranean countries**

<b>Country</b>	<b>Date</b>	<b>Acreage farmed organically (ha)</b>	<b>%</b>	<b>Number of farms</b>	<b>%</b>
<b>Cyprus</b>	2004	500	0.44	150	n.c.*
<b>Spain</b>	31.12.2004	733 182	2.9	17 688	1.4
<b>France</b>	31.12.2004	540 000	2	11 025	1.7
<b>Greece</b>	31.12.2003	244 455	6.24	6 028	0.7
<b>Italy</b>	31.12.2003	1 052 002	6.86	44 043	2.0
<b>Malta</b>	2003	14	n.c.*	20	n.c.*

\* n.c.: not communicated

Sources: data compiled by Calleja, 2004; Papastylianou, 2004; Agence Bio 2004; Lampkin, 2004; Spanish Ministry of Agriculture, 2005, and Italian Ministry of Agro-Food Policies, 2004.

### *i) Organic production and certification in the Euro-Mediterranean countries:*

#### **Cyprus**

Legislation was passed in 2001 on the control of organic agriculture. Certification and inspection are carried out by local certification bodies and the national action plan makes provision for subsidies for plantations and animal production units (Papastylianou, 2004).

**Table 8.7 – Some data on the organic sector in Cyprus**

Years	Number of farms	Acreage (ha)	Development of acreage farmed organically	Percentage of the total agricultural area
2002	45	166.5	---	0.12
2003	85	301	+81%	0.22
2004	150	500	+66%	0.44

Source: Papastyliaou, 2004 (CIHEAM, 2004) (modified).

### **Spain**

The total organic production acreage is approximately 733 182 ha (31/12/2004). The average size of an “organic” farm in Spain is 28 hectares compared to 18 hectares for “conventional” farms (Spanish Ministry of Agriculture (MAPA), 2005: [www.mapya.es](http://www.mapya.es)).

Although, according to the Ministry of Agriculture, Spain was exporting approximately 99.6% of its organic produce in 2003 (MAPA, 2004), the percentage of organic products exported varies according to the source (>80% according to the SEAE [Sociedad Española de Agricultura Ecológica] – Spanish association for organic agriculture).

### **France**

In 2004, 540 000 ha were farmed organically, i.e. approximately 2% of the total agricultural area (-3% compared to 2003). These figures include acreage under conversion: 61 000 ha (compared to 145 000 in 2003) (Agence bio, 2004).

Exports account for some 17% of French organic production and consist mainly of high value-added products. France's main organic exports are cereals, which go to Germany and the Scandinavian countries. Most of the dairy, meat, poultry and fruit and vegetable exports are sold to the neighbouring countries in the European Union (EU) (Paison, 1999).

Organic agriculture was recognised by the public authorities in France in 1980 and it constitutes one of the four official marks for identifying quality and origin alongside the Protected Designation of Origin (PDO), Red Label and Certification of Product Conformity (CCP) marks. It differs from those marks in that synthetic chemicals and GMO derivatives are not used, organic matter is recycled, crops are rotated and pest control is biological. In organic animal husbandry, which is extensive, farmers use “alternative” medicines (homoeopathy, herbal therapy) and respect animal welfare.

France was one of the first European countries to establish very comprehensive regulations on organic agriculture. These regulations currently govern organic farming in the country and are composed of two essential instruments: Regulation

EEC/2092/91 of 24 June 1991 in its amended form, which has been in effect since 24 August 2000; it concerns the methods used in the organic production of plant products and includes the provisions of Regulation EC/1804/99 of 19 July 1999 on animal products. The French specifications REPAB F of 28 August 2000 concern the methods used in animal husbandry and the production and preparation of animal products.

### **Greece**

Organic agriculture has been developing rapidly in Greece ever since it was established, with annual growth rates of between 50% and 120%, although the growth rate dropped to 20%-30% from 1999 to 2000. According to the Ministry of Agriculture, the total acreage devoted to organic crops in Greece was estimated at 22 000 ha in 2001 compared to only 1 200 ha in 1994. In 2004 the organically farmed acreage was estimated at 244 455 ha, i.e. 6.2% of the total agricultural area in Greece (Lampkin, 2005).

Approximately 50% of Greek organic produce – more specifically olives, olive oil, wine, fresh fruit and lemons – is exported, mainly to European countries and, to a lesser extent, to the United States and other countries (Rose, 2001).

### **Italy**

In 2004, the estimated agricultural area occupied by the 44 034 organic farms was 1 052 002 ha (Italian Ministry of Agro-Food Policies, 2004), i.e. 6.8% of the total agricultural area. Italy is Europe's biggest producer in the organic farming field.

The average acreage of organic farms is approximately 21 ha, 80% of which is farmed organically. It should be noted that in the case of 6.3% of these farms organic agriculture is combined with agro-tourism, and many farms also have a small-scale processing unit. The typical producer is an entrepreneur – an image which shocks no one in Italy. These farm managers, whose labour force is composed mainly of family members, declare an average turnover of €28 050, €18 000 of which is obtained from their organic farming activities (Pinton and Zanolì, 2004).

The national consumption rate is still low, although the annual growth rate is between 20% and 40%. The fruit and vegetables grown in the south of Italy could be added to these figures; this produce is sold through the conventional channels without any reference to organic agriculture. These products account for quite a sizeable share – probably around 13% (Pinton et Zanolì, 2004).

Exports go mainly to northern Europe – 30% of the products consumed in Europe come from Italy (Chicco, 2002) – but also to the United States and Japan. They consist mainly of fresh products or products which have undergone very little processing such as cereals, flours and pasta, olive oil or fruit and vegetables. In order to cover its needs Italy resorts to imports amounting to €305 million (Pinton

and Zanolì, 2004): dairy products and agri-foodstuffs from other European countries and fruit and vegetables from South America.

### **Malta**

The organic sector in Malta has developed considerably since the country entered the EU. National regulations have been introduced and a competent national authority has been set up within the Ministry of Agriculture to support the sector at all levels: economic, technical, social, etc.

There were 20 farms registered with the organic agriculture authority by May 2004; 15 of them are situated in Malta, 4 in Gozo and 1 in Comino (the latter are Mediterranean islands close to Malta); 19 of these farms harvest and sell their produce as well as their derivatives. No animal farm had yet been registered by the end of May 2004. The acreage farmed has increased – from 3.2 ha (registered in October 2003, Petruzzella and Verrastro, 2003) to 14.45 ha (Calleja, 2004), but this area has not yet been certified since there is no certification system as yet in Malta.

### *ii) Organic production in the Mediterranean countries (excluding Europe):*

#### **Albania**

The first organic farms were established in 1997. The total area farmed organically is estimated at 200 ha (Isufi, 2004), whereas it was estimated at only 4 ha in 2001 (Furrùni, 2001). The Albanian parliament passed a law on organic agriculture in 2004, but there is as yet no national policy for developing the organic sector.

#### **Algeria**

The first attempts to introduce organic agriculture in Algeria began in 2001 with several integrated farming units, which enjoyed considerable support from the Ministry of Agriculture. According to the statistics of the national marketing board of the vines and wines programme, the organic sector is estimated at approximately 1400 ha (Telmat and Hadgeres, 2003). A unit for the control and certification of organic products was set up within the Ministry of Agriculture in 2002 and is responsible for training and extension as well as for drawing up regulations and establishing an approval system.

#### **Egypt**

It was as the result of a German initiative that organic agriculture was introduced in Egypt. The first certifications were carried out 20 years ago in order to meet the requirements of foreign importers of medicinal plants (El-Araby, 2001). Local and foreign bodies are responsible for inspection activities. There is as yet no national certification and subsidisation policy, but this has not been an impediment to the marketing of organic products.

There are two major “organic and biodynamic” farming projects that are now well established in Egypt: the Sekem and UGEOBA (Union of Growers and Exporters of

Organic and Biodynamic Agriculture) initiatives. Over 3 500 ha were farmed organically in Egypt in 2004, and a wide range of products is available both on the domestic market and for export (El-Araby, 2004).

Exports account for approximately 85% of total organic markets, the remaining 15% of products being sold on the domestic market (El-Araby, 2004). Great efforts are being made in this field to improve local markets and encourage organic markets. The main exports generally go to EU countries, Scandinavian countries, the United States, Japan, Australia and the countries of the Gulf.

### **Israel**

Organic agriculture emerged in Israel about thirty years ago (Adler, 2001), but was not tremendously successful. A special department of the Ministry of Agriculture is responsible for certifying products intended for export. Both the domestic market and the export market are developed markets. The 400 farms practising organic agriculture have a total acreage of approximately 5 640 ha; they include cooperatives, private farms and industries producing organic goods (Eshel and Rilov, 2004).

### **Jordan**

The organic sector is just emerging in Jordan but seems to be developing rapidly. It began in Jordan in 2001 once the Department of Organic Agriculture had been set up within the Ministry of Agriculture (Zaabi, 2003). The organic sector in its entirety covers an agricultural area of approximately 7 ha (Al-Damarat, 2004).

### **Lebanon**

Organic farming developed in Lebanon about 10 years ago in response to the mismanagement and "non-sustainability" of the production system employed in the agricultural sector after the war. It was launched through private initiatives and non-government organisations (NGOs). Various activities have been established to promote the development of the domestic market. National regulations have already been submitted to the authorities, which are expected to approve them by the end of 2005. In the past two years, the organic sector increased from an area of 185 ha in 2003 to 750 ha in 2004 including farms under conversion (Khoury, 2004), i.e. an increase of over 310%.

### **Morocco**

Although Morocco was one of the first Mediterranean countries to introduce organic production, there is still no control of the activity at the national level. This lack of control was not a major obstacle to the first organic farmers, and the organic sector registered an area of approximately 20 000 ha by 2004 (Kenny, 2004). Although there is great potential in the country for organic farming, which should be supported by a national strategy, no such strategy has yet been established.

**Syria**

Although organic farming is still in embryo in Syria occupying an agricultural area of only 260 ha, the Syrian government is taking great interest in the sector and planning to support it to the full. A committee on organic agriculture is due to be set up and a national strategy established for supporting the organic sector (Makhoul, 2004).

**Tunisia**

Organic agriculture began in Tunisia in the mid-1980s as a result of private initiatives and developed slowly until 1997. The sector (which covered an area of 35 000 ha in 2004) has registered a high growth rate in the past few years due to government support based on a national strategy. Tunisia was in fact one of the first Mediterranean countries to pass a national law on organic agriculture (promulgated in 1999), and it is the first country to subsidise organic farmers. This subsidisation takes various forms: direct support covering up to 70% of costs in the case of certification, or various forms of incentives such as tax relief, VAT exemption, etc. (Ben Kheder, 2004).

The bulk of production is intended for export and sold as typical Tunisian produce, the main products being olive oil and dates (Ben Kheder, 2004). A strategy is currently being elaborated which aims to encourage local marketing and consumption of organic products.

**Turkey**

Organic farming began in Turkey in the mid-1980s. National regulations were established in 1994, the competent authority being the Ministry of Agriculture, which is responsible for the overall management of the sector. Turkey is the only Mediterranean country which has designed an official body responsible for collecting statistical data (Babadoğan and Koç, 2004). A production area of 103 190 ha was registered in the sector in 2003, i.e. 0.4% of the total agricultural area (Turkish Ministry of Agriculture and Rural Affairs).

Foreign importers are becoming more and more familiar with Turkish organic products – there were some 37 countries importing such products in 2003 (according to the above Ministry). Most exports go to European countries such as Germany, the Netherlands, the United Kingdom, Italy and France, and further export markets are developing in Switzerland, the US, Belgium, Denmark, Austria, Thailand, Spain, Canada, Australia, Sweden, Bulgaria, India, Japan, Slovenia and New Zealand (Babadoğan and Koç, 2004).

There are two further points which clearly differentiate the Euro-Mediterranean countries from the other (developing) Mediterranean countries. First, the relative significance of organic production in the southern Mediterranean countries is still limited (a total acreage of 0.18 M ha and an average farm acreage of approximately 6.8 ha) compared to Mediterranean organic production as a whole (2.75 M ha and an average farm acreage of 34.8 ha), i.e. approximately 7% (compared to 4% in

2001 and an average farm acreage of 5.1 ha in non-EU Mediterranean countries and 24 ha per farm in the Euro-Mediterranean countries [Fersino, 2001]). However, the growth rates registered in these countries in the last few years suggest that the sector is developing rapidly in the southern Mediterranean (increasing from 81 000 ha in 2002 to 182 000 ha in 2004 [Al-Bitar, 2004], i.e. an increase of approximately 230%). Furthermore, a considerable difference is observed (in the period from 2001 to 2004) in the average farm acreage that is farmed organically. Organic farms in Euro-Mediterranean countries are in fact five times larger and have the largest production capacities. And in addition to this difference in production area there is also a difference in the use of organic products. For whereas the Euro-Mediterranean countries – such as France, for example – produce, consume and even import organic products, organic production in the countries of the South is geared to a very large extent – almost exclusively – to export (Algeria, Egypt, Tunisia, Turkey, etc).

#### 8.2.2.2 - Hydroponic products

This section aims to describe the situation regarding hydroponic production in the Mediterranean region, despite the difficulty in finding recent information on hydroponic production units in that zone.

**Table 8.8 –Hydroponic production area in several Mediterranean countries**

Country	Date	Production area (ha)	Sources
<b>Cyprus</b>	1999	3	Production in 1999 (Chimonidou and Pavlidou, 1999)
<b>Egypt</b>	1996	115	Production in 1996 (Olympios, 2002)
<b>Spain</b>	1996	1 000	Production in 1996 (Donnan, 1998); Production in 2001 (MAPA, 2002)
	2001	4 000	
<b>France</b>	1996	1 000	Production in 1996 (Donnan, 1998); Production in 2002 (Padilla and Oberti, 2005)
	2002	1 500	
<b>Greece</b>	1996	33	Production in 1996 (Donnan, 1998) ; Production in 1999 (Mavrogianopoulos, 1999)
	1999	60	
<b>Israel</b>	1996	650	Production in 1996 (Donnan, 1998)
<b>Italy</b>	1996	36.8	Production in 1996 (Olympios, 2002); Production in 1999 (Pardossi et al. 1999)
	1999	400	
<b>Morocco</b>	1996	27.5	Production in 1996 (Olympios, 2002)
<b>Tunisia</b>	1996	10	Production in 1996 (Olympios, 2002); Production in 1999 (Kouki, 1999)
	1999	30	
<b>Turkey</b>	1999	10	Production in 1999 (Tüzel and Gül, 1999)

#### **Cyprus**

The area devoted to soilless culture in Cyprus was evaluated at 3 ha in 1999 (Chimonidou and Pavlidou, 1999); rockwool is used as the substrate.



**France**

France had 3 000 ha of greenhouse horticulture in 2002, 50% of which was devoted to soilless production, and 1000 ha of these soilless cultures were devoted to tomatoes.

Foreign competitors in this field of production are China, Italy and Spain. All cucumber production in France is soilless, and strawberry production is also tending to become hydroponic. Furthermore, farms are only viable if they have a soilless tomato production area of at least 4 ha and production is continued throughout the year (Padilla and Oberti, 2005). They have contracts with the large-scale retail trade, which stipulates very strict specifications causing difficulties for small multi-product farms, which can only sell their produce on alternative markets in the informal sector.

**Tunisia**

It was following the emergence of problems due to the accumulation of salts in the soil and the rapid spread of disease that soilless culture was introduced in Tunisia. The total soilless production area was estimated at 30 ha in September 1999 (Kouki, 1999).

**Turkey**

Interest in soilless cultivation techniques is growing in Turkey, a total area of 10 ha being devoted to hydroponic production in 1999. Research is focusing mainly on soilless culture, various substrates having been tested with various crops (tomatoes, cucumbers, eggplants, lettuces and strawberries) (Tüzel and Gül, 1999).

As is the case with organic products, there is a difference in hydroponic production area between the Euro-Mediterranean countries and their southern counterparts. In 1996, the Euro-Mediterranean countries registered a production area of approximately 2 570 ha, whereas the production area registered in the other (non-European) Mediterranean countries was only around 803 ha. This difference in production area is probably due to the high investment costs, which many producers in non-European Mediterranean countries can ill afford. It must be borne in mind, however, that these data are fairly dated and do not cover all hydroponic production units in Mediterranean countries; they must therefore be used and interpreted with precaution.

In addition, a further point which draws attention is the rapid growth of the organic and hydroponic production sector in the Mediterranean region (+ 300% in the period from 1996 to 1999 in Tunisia, for instance, and + 55% in the period from 1996 to 2002 in France). This development raises the question of the advantages, limitations and specific features of these production methods in the Mediterranean region.

The following section aims to present the advantages and limitations of organic and hydroponic production methods in the Mediterranean region and then to explain

the specific features of these methods in the case of the few countries for which we have been able to collect data on organic production (Egypt, Lebanon, Tunisia and Turkey).

### **8.2.3 - The advantages and limitations of these production methods in the Mediterranean region**

#### 8.2.3.1 - Organic production

##### *i) General comments:*

Mediterranean organic agriculture experiences all of the problems affecting the agricultural sector in general (Europe & Liberté magazine, 2004), such as:

- the introduction of new varieties which are more prone to the influence of biotic and abiotic factors;
- the excessive use of mineral fertilisers, particularly nitrogen, which makes certain plants more prone to fungous diseases and parasites;
- the development of the resistance of pathogenic microbes to insecticides, weed killers and fungicides;
- the modifications in plant physiology caused by certain pesticides making the plants more prone to attack and to disease;
- little or no use of biological fertilisers.

In addition to the above problems there is also the problem of adapting the current international and European regulations to the specific features of the region. For all of the rules on organic production methods (Rush-Muller, Biodynamics; Lemaire, IFOAM standards and EEC regulations) have been established historically in northern European countries and do not take account of the specific characteristics of Mediterranean countries. ((Fersino and Petruzzella, 2002). Problems concerning the applicability of the regulations are due to the specific features of the Mediterranean sector and make access to this production method difficult (as is the case in Egypt).

##### *ii) Case study covering several Mediterranean countries:*

#### **The case of Egypt**

The following are the main problems encountered in the development of the organic sector in Egypt:

- Several standardisation aspects concerning the long conversion period (three years) and the conversion conditions required by the EU;(the crop season is no longer than 4 or 5 months a year in certain regions, products are sold as conventional products during the conversion period, and there is no subsidisation whatever for farms undergoing conversion).

- Organic seed is difficult to obtain and very expensive.
- Organic treatment products (insecticides) are imported and very expensive. (El-Araby, 2004).

### **The case of Lebanon**

Although the climate and soil are suitable for organic production, the absence of control, the limited size of organic farms (164 farms occupy an agricultural area of approximately 758 ha [Khoury, 2004], i.e. an average farm acreage of less than 5 ha), and difficulties in cooperation amongst producers make it difficult to develop the organic sector.

### **The case of Tunisia**

Due to very favourable production conditions – weather conditions that are unfavourable for parasites and disease, the existence of traditional production techniques (Ben Khedher and Nabli, 2002) – many agricultural zones can easily be converted to organic production zones.

These environmental advantages create excellent conditions for production and for increasing organic production. However, the lack of fertilisation products, products for controlling parasites and diseases, equipment used in organic agriculture (e.g. for managing compost and weeds), veterinary medicines, and experience in marketing organic products constitutes a major difficulty for converting farms in certain regions of Tunisia (Ben Khedher and Nabli, 2002).

And as regards agronomic aspects, the soil is generally poor (low content of biological matter, low biological activity and fragile soil structure). The main problems concerning improvement of soil fertility concern: a) the introduction of green manure in rotation programmes; b) the training of farmers in compost management; c) finding (a sufficient quantity of) authorised biological and mineral fertilisers in Tunisia (Ben Khedher, 2004).

### **The case of Turkey**

Although organic farming is developing in Turkey, if sustained growth is to be achieved in the organic sector a national strategy must be imposed, institutional and legislative changes must be made, and technical and financial support must be provided for the various farmers undertaking conversion measures; this would support research in priority regions and training through the production chains. (Maloupa, 2000).

To sum up, the main limitations of organic production in Mediterranean countries seem to be the gap between the requirements set by foreign importers and the specific features of production units in Mediterranean regions, the lack of subsidies for farms undergoing conversion, the lack of crop treatment products and the absence of national coordination and control.

### 8.2.3.2 - Hydroponic production

#### *i) Advantages:*

Several of the advantages of hydroponic production methods (reduction of labour, increase in productivity, effectiveness of sterilisation practices, economisation of water and control of culture nutrition, control of the root environment, the possibility of growing many different crops without needing to have the soil suited to those crops) are more important in the specific case of Mediterranean countries.

First of all, in regions of the Mediterranean where arable acreage is limited, hydroponic production techniques provide an advantageous alternative.

Secondly, hydroponic production could bring higher yields, for accurate control of the nutrition of plants in soilless cultures would result in higher yields and better quality, but this does not necessarily mean that the yields of the best crops (grown in soil) are appreciably lower. (Olympios, 2002). However, if there are soil problems (saline soil, poor soil, etc.), soilless cultures will obviously produce much better harvests.

Thirdly, water is certainly the most important factor for plant production, particularly in the case of Mediterranean production. It is a limiting factor, not only in terms of availability but also in terms of quality. Hence the advantage of hydroponic cultivation systems, particularly those where water is recirculated and substantial quantities of water can thus be economised since drainage and surface evaporation are considerably reduced (NFT, "closed" systems, etc.). (Olympios, 2002). Basically, hydroponics can be regarded as a water conservation production system since it requires only 10% to 20% of the water needed to produce the same crop in soil culture (Bradley and Marulanda, 2000; UNDP, 1996). It is thus regarded as a prime technique in arid climate conditions (Schwarz, 1995). Such water economy is a major advantage of hydroponic production in the Mediterranean regions where water is very scarce.

Furthermore, soilless cultures offer an ideal alternative for growing crops whenever the soil is unsuitable (Moroccan land unsuited to production due to excessive use of methyl bromide) or whenever there is no soil at all (as is the case in certain regions of several Mediterranean countries such as Egypt, Libya, etc).

It can also be added that the nutrients in the soil which have not yet been used by the plants can be leached out by rain or irrigation water, and this "loaded" water seeps into the soil, eventually contaminating ground, river and lake water. Organic crop-growing methods seek to limit these phenomena. In the case of hydroponic systems where irrigation water is recirculated (closed systems) there is no seepage and no contamination of the environment. Most of the products that are added into the system are used by the plants (source: [www.thehydroponicum.com](http://www.thehydroponicum.com)). It is

thus indeed a “non-pollutant” method which requires less fertilisers and pesticides than conventional systems.

*ii) Limitations:*

The main limitations of hydroponic production systems remain the initial outlay involved in building the facilities and the maintenance costs. For in some Mediterranean regions there is little or no subsidisation of these production methods, particularly in the southern Mediterranean countries.

The construction of soilless production structures requires considerable initial investment compared to soil cultures, the level of these investments depending on the type of hydroponic culture chosen and the degree of sophistication of the control and irrigation measures (Olympios, 2002). In terms of agricultural production systems hydroponics was actually classed by Ruthenberg (in 1980) as a high risk system involving considerable inputs. The techniques available to date do in fact require considerable specialisation, sophisticated management and specific know-how, and they also involve high financial risks (Schwarz, 1995), for the deficits caused by poor harvests can be disastrous.

Furthermore, in order to practice hydroponics successfully one needs to have some knowledge of or be able to learn the rudiments of plant physiology and elementary chemistry and to understand how the control system works, and so on, but this knowledge can only be acquired through appropriate training or by recruiting technicians or engineers, which most producers in the southern Mediterranean cannot afford.

To sum up, the overall advantages of hydroponic production in the Mediterranean region are still water economy and increase in yields (in certain regions where the soil is not particularly suitable for growing crops), whereas the limitations of these production methods are no doubt the initial construction costs and the high level of training required in technique and management skills.

One might also wonder whether hydroponic products could be organic and could thus be regarded as “health” products. The answer to this question is ‘no’, since hydroponic products are by definition grown in soilless cultures, whereas in order for a product to qualify as organic it is absolutely essential that it be grown in soil. Furthermore, there is as yet no biological fertiliser for soilless cultures. Hydroponic production could constitute an alternative “ecological” cultivation method if combined with a policy of integrated pest control concerning the use of pest control products.

*iii) Outlook:*

In the Mediterranean region attention must be focused on developing and evaluating local substrates so that they can be used for hydroponic production (Olympios, 2002). For the use of less costly substrates which farmers are familiar with, such as sand from the Mediterranean region (the most abundant substrate in the zone), gravel, perlite, pumace, etc., could facilitate the development of hydroponic cultures in Mediterranean regions. What is more, it is important to use local substrates which are efficient when used with water of satisfactory quality.

In view of the productivity problems encountered by many Mediterranean countries (drought, poor soil, no soil, etc.), it is therefore urgently necessary to find a hydroponic production system which is easy to use and not too costly for farmers.

## ***9 Mediterranean consumers and products protecting the health and the environment***

The present-day context is marked by loss of citizen-consumer confidence in food products. Yet the operators in the agro-food sector (producers, industrialists, distributors) are undertaking measures which ought to reassure consumers more: more stringent control of quality and food safety, more information and greater transparency with regard to public opinion. These initiatives are not always effective; they can even help to increase public uncertainty, and they do not suffice to build or restore confidence amongst the actors themselves and between consumers and the agro-food sector.

In order to trust producers, consumers expect the actors in the sector to commit themselves to more environmental ethics, more social ethics and a health guarantee. Six major movements have thus emerged for building up agri-foodstuff quality around these commitments. In the case of the environmental component there is organic farming, integrated farming and hydroponics; in the case of the social component there is fair trade and ethical trade; and in the case of the health component there are health-enhancing foods, fortified foods or diet foods, and even products with a guaranteed nutritional content. These movements are growing in importance in terms of both product marks (multiple quality labels and marks) and consumer perception (Codron et al, 2002). In terms of history and origin, a distinction can be made between the organic farming and fair trade movements, which have developed in radical opposition to the dominant industrial system, and integrated farming, ethical trade and health movements, which are an integral part of the predominant model.

How do consumers react to these products? Do they really meet consumer expectations? Do they have an adequate future in consumption? Although there are in fact very few surveys at our disposal enabling us to answer these questions, particularly in the southern Mediterranean countries, where consumer awareness is very recent and still marginal, we shall nevertheless endeavour to outline the situation.

## **9.1 - Consumer perception and purchasing motives in the Euro-Mediterranean countries**

### **Spain**

In Spain, the term "bio"<sup>1</sup> is used to describe all health products and does not necessarily refer to organic production methods. It is a term very widely used by the food industries, which is confusing for consumers, only 3% of whom think "organic product" when they see the term "bio". (USDA, 2005). Consumers consider that their Mediterranean diet is natural and therefore biological. They are thus much more interested in how olive oil is extracted, for example, than in how olives are grown. Yet Spain is the fourth organic producer in Europe, with a market value of US\$300 million, 40% of which concerns olive oil.

Many consumers' motives for purchasing organic products focus on the wholesomeness and safety of food for themselves or their family. Others have more idealistic reasons for buying them that are connected with the environment and animal protection, for example. The purchasing motives of most clients, however, are related to health, taste, and the environment. (Joensen, 2003).

### **France**

A quality survey on all organic foodstuffs was conducted jointly by the CSA<sup>2</sup> and the Agence Bio<sup>3</sup> in October 2003 on a sample of 1000 people representing the French population. It revealed that 83% of the French view organic products positively and 54% have already consumed such products; 37% of the French population are regular consumers.

When one compares the virtues of organic products with those of non-organic products, one notes that consumers find that organic products are more natural (85%), better for the environment (84%), better for the health (79%), and respectful of animal welfare (74%), that they have higher nutritional qualities (66%), that they are manufactured non-industrially (62%), and that they taste better (59%) (CSA/Agence Bio survey, 2003). Consumers thus regard organic products as healthier and more natural.

In short, the main feature of organic farming seems to be that it is reassuring with regard to food safety. Although the "environmental" side of organic agriculture is visible (mentioned by 84%), it seems to come after health concerns.

Consumers have numerous expectations with regard to organically produced foods and their reasons for consuming these foods are evolving. The predominant reason

---

<sup>1</sup> One of the terms for "organic farming" in Spanish and French is literally « biological farming ». – T.N.

<sup>2</sup> French broadcasting regulatory body – T.N.

<sup>3</sup> French public interest grouping for the promotion of organic agriculture – T.N.



registered in 1991 was that they had health benefits (48% of the reasons given for consuming organic products). Quality and taste came next (22.1%), conformity with ideals (10.6%), and, finally, environmental concerns (9%); this latter reason is progressing slowly and is quoted mainly by young consumers (30-35-year age group) (Sylvander, 1998). Ten years later the CSA/Printemps Bio opinion poll (2001) highlighted four consumer motives for buying organic products: health benefits (73% of interviewees), quality and taste (66%), ethical, environmental and animal-welfare reasons (46%), and, finally, food safety (40%).

For the last five years or more, some of the new consumers have turned to organically produced goods and labels in general as the result of the various health or social crises ("mad cow disease", the debate on GMOs, dioxin, etc.) (Sylvander 1999). They seem to have even greater expectations in general with regard to food safety. In the CSA/Printemps Bio survey, for example, 57% of the French considered that organic farming provides a satisfactory solution to the current concern about food safety (almost 80% of this group were regular consumers and 70% occasional consumers).

The reasons for consuming organically produced products thus do not necessarily reflect the objectives of the specifications for organic farming: the vast majority of consumers consider that organic agriculture provides a means of obtaining more wholesome food which benefits the health, whereas the principal objective of organic farming specifications is environmental awareness in farming practices.

There are two categories of organic product consumers that can be identified: occasional consumers (consuming 1 to 5 different organic products per week), who make up approximately one-third of the general population, and regular consumers (consuming more than 6 different organic products per week), who make up less than 6% of the general population.

Botanical organic foods account for 3% of all plant products consumed. Animal organic foods account for 1.7% of all animal products consumed with the exception of eggs (they account for 3.5% of egg consumption).

The data from the INCA survey<sup>4</sup> show differences in the quantities of foodstuffs consumed (irrespective of whether they are organic or conventional products) between organic product consumers (regular or occasional) and consumers who do not consume organic products.

### **Italy**

The majority of Italian consumers are located in the north of Italy, where the major economic structures are established, whereas organic production units are generally situated in the south of the country. A survey conducted by the

---

<sup>4</sup> National survey on the food consumption of individuals – T.N.

“Demoskopea” research institute in May 2001 revealed that 73% of consumers are familiar with and can define the term “organic” and that 22% give definitions that are rather vague but not incorrect. In September 2000, a study of the “Ispo” opinion poll institute showed that some 77% of (adult) Italians thought that organic products were safer for the health, 75% of the persons interviewed thought that organic farming was healthier for the environment, and 63% thought that organic products tasted better; 42% of Italians seem to be willing to pay a higher price for this type of product. The study showed in conclusion that 14% of the Italians interviewed were regular consumers, whereas at the end of 2002 the figure had been only 11%. According to IRI infoscan, the consumer profile in 2002 was more a city dweller from the north of the country between 30 and 60 years of age with an average and/or higher level of education and average or high income (Pinto and Zanoli, 2004).

As can be seen, environmental concerns are not consumers' primary motive for purchasing organic products; this is also the case in France and Spain, as has already been mentioned, and it poses the problem of the sustainability of organic agriculture, since the primary purpose of organic products is not to preserve the health of human beings, and their beneficial effects on human health have not yet been scientifically proved.

We have some data at our disposal on the profile of non-European Mediterranean consumers and their purchasing motives, so that we can draw up a North-South comparison and check whether there is a homogeneous Mediterranean conception of organic products.

## **9.2 - Perception and purchasing motives of (non-European) Mediterranean consumers**

Very few consumer studies have been carried out on the perception of organic products in developing Mediterranean countries, so that it is impossible to have a general idea of the consumer profile. The limited number of surveys that have been conducted provide a means of explaining the behaviour in certain developing Mediterranean countries, however, but can on no account be applied as a general rule to the entire Mediterranean region.

### **Lebanon**

Lebanese organic product consumers buy these products for various reasons, which have scarcely changed over the last 20 years (Brombacher and Hamm, 1990; Crier, 2001). In the mid 1980s, the main reasons for consuming organic products were health reasons followed by disappointment with conventional products. A consumption survey conducted in 2002 shows that organic product consumers are relatively well-off, with an annual income of over US\$12 000 and sometimes over US\$24 000 (Bteich, 2004). These consumers thus have incomes between 5 and 10

times higher than the minimum annual income in Lebanon (approximately US\$2 400). So although no statistical study has been carried out on the percentage of the total population familiar with organic production methods, these figures suggest that the proportion is relatively low. In 2005, 61% of households still mention reasons of health followed closely by the contribution of these methods to the environment (55%). Approximately 58% of buyers choose organic products because of their added value and because they epitomise higher-grade foodstuffs, and almost 40% of consumers are attracted by the taste, which they find better (Annassi, 2005).

### **Turkey**

A consumer survey conducted in Turkey in 1999 (1005 households selected at random) revealed that 75% of the interviewees stressed the nutritive value of organic products and the fact that they contained no residues as the major reasons for buying such products (Akgüngör et al, 1999).

Whereas organic farming accounts for a relatively large proportion of Turkish agricultural production (103 190 ha in 2004 [Babadoğan and Koç, 2004]) accounting for 56% of Mediterranean production (excluding Europe) and 3.7% of total Mediterranean production in the organic farming sector, the percentage of persons aware of the existence of organic products (9%) is relatively low. This may be due in part to the fact that the vast majority of organic farms produce for export and to the limited development of local markets. Furthermore, one of the reasons for the low level of consumption is that most consumers have difficulty in differentiating between organic and conventional products (Babadoğan and Koç, 2004).

There thus seems to be quite a difference in organic product consumer profiles between the Euro-Mediterranean countries and the other Mediterranean countries, although consumers seem to be relatively well-off in general and motivated in particular by health reasons. For although the conception of organic products as "health" products is common to all of these countries, Euro-Mediterranean consumers are more aware of the environmental side of these products compared to their counterparts in the southern Mediterranean countries.

There are also differences in the percentage of persons who are aware of the existence of organic products. These differences may be due on the one hand to experience of organic farming (the countries in the North being about 20 years ahead of those in the South), to the fact that Euro-Mediterranean consumers have become more aware as the result of the food crises of the past 20 years such as the ESB crisis or the cases of dioxin contamination, and to the scale of the communication campaigns on organic products.

Other products such as those grown in soilless cultures can also be classed as "environmental" products. For in view of the methods used for producing these commodities they could provide a solution to consumer apprehension with regard

to the degradation of the environment and ecosystems and could play a role in environmental conservation.

However, only very few consumer studies on hydroponic products have as yet been carried out in the Mediterranean region. The data from a consumer survey in Morocco are the only data included in the present chapter; they cannot, however, be applied as a general rule to the Mediterranean region as a whole.

### **9.3 - Consumer perception of hydroponic products**

Consumer interest in the methods used for producing the foodstuffs they consume is growing in general. Consumers are worried by the increase in the use of chemicals, pesticides and biotechnology (Smith, 1996) and they therefore tend to seek foodstuffs whose production has a minimal effect on the environment (Ottman, 1992). These consumers could thus be interested in hydroponic products, which would be produced by environmentally sound methods such as solution cultures where the water is recycled, the production environment is controlled, and less weed killers, insecticides and pesticides are used.

The IAM thus conducted a consumer survey in Morocco in order to determine how Mediterranean consumers perceive hydroponic products (Oberti, Padilla, El Jabri, 2005). These original data concerned only one product – tomatoes – and cannot be applied generally to the other Mediterranean countries. Only very few plants are actually grown in soilless cultures (tomatoes, cucumbers, lettuces, sweet peppers, etc.). The limited information may be due to the limited number of consumer surveys on Mediterranean hydroponic products on the one hand and to the low percentage of consumers familiar with this type of production method on the other. For no matter where the products are purchased the production method is never mentioned.

This survey shows that, taken as a whole, environmental and health aspects are not the main criteria involved in the purchase of foodstuffs in Morocco; pleasure and the good taste of products are still the main criteria. Furthermore, when one pursues the analysis further one observes that men are more interested in production methods for reasons of safeguarding their health as opposed to women, who seemed to be more interested in the organoleptic qualities of products. The traditional production methods (Beldia) seem to be the only methods which fulfil all of the conditions for obtaining a "good product". Similarly, the urban population is more aware of the environmental and health aspects of certain hydroponic production methods (Oberti et Padilla, El-Jabri, 2005). These differences in the purchasing criteria of men and women could be due to the lifestyles of the Moroccan population. Surveys were also conducted in Turkey for comparative purposes. Products grown in soilless cultures are not well known to consumers, although the latter are quite in favour of these foods. In many cases, if products of

this type meet their expectations they do not reject them and are prepared to consume them without any apprehension. Turkish consumers make very conscious choices when purchasing their food and attach great importance to the organoleptic qualities of products in particular – they seek the "taste of bygone days".

#### **9.4 - Conclusion**

Farmers, industrialists and distributors have never been so concerned about the food safety of the products they supply to consumers, yet consumers have never exacerbated the risks connected with their diet to the extent they do today. There is an appreciable discrepancy between the real risks and the risks that are perceived. When problems occur they are spectacular and are given wide media coverage. Consumers therefore resort to new foods for which there is a certain guarantee that they have been produced according to methods which conserve the environment or which incorporate an ethic or which are declared to be good for the health. It is observed from the results of the various surveys conducted in both the northern and southern Mediterranean regions that the education and information provided for consumers in the north do not have the expected effects. Despite product labelling that is designed to provide information on the product, consumers still confuse environmentally friendly products and products which safeguard the health – to the extent that organic products, for example, are diverted from their initial purpose, which is to practise an environmentally sound production system. Food safety is no longer the priority for European consumers, no doubt because they now have confidence in this aspect of the food system. They are very interested in the health aspect of food, on the other hand, combined with hedonistic values (taste, organoleptic qualities). Consumers in the non-European Mediterranean region are gradually becoming aware of the health risks connected with their diet but are still rarely concerned by the health aspects of products and even less by the environmental aspects. Access to so-called environmentally sound and health-conscious foods is limited for these consumers, since these foods are produced locally for export. These consumers consider that production in accordance with crop-growing traditions is the main factor providing a health guarantee.

## **PART IV**

# **Country profiles: Spain, Algeria, Egypt**

Slimane BEDRANI, INA Algiers (Algeria)  
Victor D. MARTINEZ GOMEZ, Universidad Politécnica de Valencia (Spain)  
Mahmoud Mansour ABD EL-FATTAH, El Azhar University, College of Agriculture, Cairo (Egypt)

## **10 Spain**

### **10.1 – Agriculture and the Spanish economy**

#### ***10.1.1 - Development of the Spanish economy and prospects***

The Spanish economy showed sound growth in 2004 enabling the country to consolidate the good performance in 2003 and previous years, and thus continuing convergence towards the European average. However, this positive balance may be overshadowed by two factors – inflation and the trade balance –, as is discussed in the following paragraphs.

According to the latest National Statistics Institute data, the economy as a whole grew by 3.1% in 2004 compared to 2003 in terms of GDP, with constant growth rates throughout the year<sup>1</sup>. As in previous years, growth was mainly sustained by internal consumption, with the addition of a remarkable increase in investment. On the other hand, poor results were recorded in net exports bringing total growth down by 1.6 percentage points. The main figures for the Spanish economy in 2004 and 2003 are set out in **Table 1**.

Public administration consumption grew over the private consumption rate (6.4% and 4.3% respectively), and both were higher than the 2003 figures. The positive evolution of private consumption is closely related to several factors, the most important being the rises in employment together with net wealth gains – due to stock market gains and the increase in value of real estate – and low interest rates combined with easy access to loans.

---

<sup>1</sup> In May 2005 the National Statistics Institute changed the method used for calculating the National Accounts, altering the data used and introducing major methodological variations. In short, with respect to statistical data, the main change is the use of new population estimates (with higher population figures than in the past). With regard to methodology, the main change is the adoption of a chain-linked index for estimates, in accordance with Commission Decision 98/715. This means that the previous year is taken as the reference year for the annual growth calculations. There is thus no fixed reference period, growth estimates for 2004 being made with respect to 2003, just as those for 2005 will be made with respect to 2004 and so on. Another methodological variation is the accounting of middleman financing activities, also due to EC regulations. As a result of all these variations, the Spanish GDP figures for past periods have increased, as illustrated in **Table 2**.

**Table 10.1 – The Spanish economy. GDP growth. Annual variation (%)**  
(New methodology - CNE 2000)

Activities	2003	2004
<b>Public and private expenditure</b>	<b>2.8</b>	<b>4.8</b>
- Household consumption	2.6	4.3
- NPO consumption	1.7	2.7
- Public consumption	3.9	6.4
<b>Gross Fixed Capital Formation</b>	<b>6.2</b>	<b>3.9</b>
- Plant and equipment	1.9	2.1
- Construction	6.3	5.5
- Other	7.8	4.4
<b>Changes in inventories</b>	-	-
<b>Domestic demand</b>	<b>3.8</b>	<b>4.7</b>
Exports of goods and services	3.5	2.7
Imports of goods and services	6.2	8.0
<b>External demand</b>	<b>-0.9</b>	<b>-1.6</b>
<b>Gross Domestic Product</b>	<b>2.9</b>	<b>3.1</b>

Source: CNE (National Statistics Institute).

**Table 10.2 – The Spanish Economy. Comparison between the new methodology (CNE 2000) and the previous methodology (CNE 1995).**  
**GDP growth in real terms, annual variation (%)**

	CNE 2000	CNE 1995
<b>2001</b>	3.5	2.8
<b>2002</b>	2.7	2.2
<b>2003</b>	2.9	2.5
<b>2004</b>	3.1	2.7

Source: National Statistics Institute.

With regard to investment, the good business results during the year and the relatively good expectations, together with factors facilitating access to loans resulted in an increase in firms' investments in plant and equipment. The continued growth in expenditure on capital formation in the construction sector is also worthy of note. In 2004 this item grew to 5.5%, contradicting expectations of a "soft landing" for the activity of this sub-sector. It was responsible for a good share of the previous year's growth, and this is likely to continue for the next few years if real estate market pressures induce construction firms to effect new investments.



Inflation continues to burden the Spanish economy. In 2004, the Consumer Price Index (CPI) rose by 3.2%, 0.6 percentage points above the 2003 result. Most of this increase is due to the rise in international oil prices, despite the fact that the euro-US dollar exchange rate was favourable for European importers. Also, the services showed considerable reluctance to lower their prices. On the other hand, industrial goods prices grew at a rather moderate rate due to competition in the sector. A remarkable trend in the food sector was that fresh food also showed restrained growth while higher growth rates were recorded for processed food.

As regards the poor results in Spanish prices, comparison with the other euro partners shows that Spain's Harmonised Consumer Price Index (HCPI) is still substantially above average. In 2004, the Spanish index showed a growth rate of 3.3%, whereas the euro-zone average was 2.4%, widening the gap between the two indexes. Indeed, only Luxembourg presented a higher HCPI than Spain among euro countries in 2004.

It should be pointed out in general that Spain is currently in a different economic cycle momentum compared to the main euro economies, with strong domestic demand that is pushing prices up to a greater extent than in other euro countries. Due to the lack of national monetary policies targeting specific national goals and other internal factors, Spanish economists are pessimistic in their forecasts for price evolution over the next few years. Several internal factors mentioned in last year's report (the lack of actual competition in several key sectors and the year-to-year wage negotiations linked to inflation forecasts) still apply. Moreover, the new government introduced a year-to-year adjustment of the minimum wage also linked to inflation forecasts, aggravating the problem, since some wage negotiations are linked to the minimum wage. **Table 3** shows prices figures for 2003 and 2004.

**Table 10.3 – Evolution of the consumer price index (2001=100)**

	<b>2003</b>	<b>2004</b>
Variation (%)	2.60	3.20
Difference compared to euro-zone average HCPI (%)	0.70	0.90

Source: National Statistics Institute.

The good results in internal activity were reflected in employment, since 422 000 new jobs were created in 2004. It is worthy of note that, whereas the services sector was the main net job creator, there seems to be a certain amount of deceleration compared to the 2003 results. Furthermore, there was a significant increase in total jobs in part-time employment and in the employment of women. In these two areas, Spain presents a considerable gap compared to its European partners. The rise in the number of employed persons brought an appreciable drop in the

unemployment rate (10.56% by the end of the year, whereas it was 11.37% in 2003), despite the fact that the working population and the activity rate increase yearly. **Table 4** contains figures on the labour situation. And finally, the significant differences in unemployment rate between men (7.76%) and women (14.55%) are a matter of concern, since women are being integrated into the labour market but it does not seem to be ready to absorb them.

**Table 10.4 – Labour statistics**

	2002	2003	2004
Unemployment rate (%)	11.62	11.37	10.56
Activity rate (%)	54.63	55.91	56.74
Total working population (1000)	19 037.2	19 811.7	20 447.5
Number of employed (1000)	16 825.4	17 559.7	18 288.1
Number of unemployed (1000)	2 211.8	2 252.1	2 159.4

Source: Active Population Survey, National Statistics Institute.

The poor results in the exporting sector are illustrated by the negative current account balance, which deteriorated throughout 2004. By the end of the year it accounted for 4.2 negative percentage points of GDP. The euro exchange rates against other currencies together with strong internal demand and the extremely competitive goods from the countries of Eastern Asian led to a vigorous increase in imports. On the other hand, exports did not improve at the same pace for several reasons, the weakness of European partners and euro exchange rates being the main factor according to the findings of several economists (Servicio de Estudios La Caixa, 2005).

Let us examine this issue further. As mentioned in the previous paragraph, external circumstances are blamed for the poor exports results. While this may be true for a given year, it is also true that net exports have been showing a deficit every year since 1998 and there may be other complementary reasons. One argument is that Spanish products have lost competitiveness on international markets. Firstly, inflation is higher than the level in competitor countries, as shown in previous paragraphs. Secondly, modernisation in human and technological capital would seem necessary in order to overcome the competitiveness gap. In the past few years, Foreign Direct Investment (FDI) has decreased in Spain due either to shutdowns or to outsourcing strategies.

Since Spain is neither a core-innovative economy nor a cheap labour country, it suffers from pressures on both scores. Measures to improve labour force skills and provide broader access to new technologies could probably help in defining Spain's role in the global division of labour and trade. According to the OECD's analysis (OECD, 2005), it is important for Spain to avoid becoming locked into

specialisation in relatively low-technology sectors where it is likely to face growing competition from countries with lower labour costs.

Spain should thus be able to attract FDI again – as a means of importing technology in the short and medium term – in view of the quality of its labour, good infrastructures, broad access to technologies and political and economic stability. The long-term challenge for the country is to convert itself into an innovative technology-exporting economy based on these solid foundations.

A final comment must be made with regard to the change in government which came about in March 2004. While the new government belongs to the left-wing parties, minor changes are expected regarding economic policies. Perhaps the main change is related to the economic stability issue: whereas the former government pursued zero public deficits at the end of the fiscal year, the current government has declared its intention to pursue economic stability throughout the entire economic cycle. Economic agents have interpreted this as a gain in the degree of freedom for public authorities to increase expenditure on social concerns, leading to minor deficits in the first years of the new government's term.

As OECD pointed out in its 2005 economic survey on Spain, while the preservation of sound public financing is warranted, the new policies must not undermine fiscal discipline. Moreover, measures to maintain a fiscal surveillance system for the regions and to strengthen the incentives for regional authorities to act in a cost-conscious way should be implemented in order to enhance the fiscal situation. The long-term sustainability of public finances, particularly with regard to public pension schemes, is also a matter of concern due to the ageing of the Spanish population.

### ***10.1.2 - Agriculture and food in the national economy***

In 2004, the agricultural sector lost 1 percentage point of value added compared to 2003; as shown in **Table 5**, it was the only sector with negative results. As was the case in 2003, it was the only sector with negative results within the whole economy and, even in years showing positive results, the agricultural performance is worse than those of the other sectors. According to the National Statistics Institute, the sector's value added accounted for 3.13% of total GDP.

As regards the share of agriculture in the labour market, the percentage is slightly higher than the rate recorded for its share in GDP. Thus, according to the National Statistics Institute, agricultural activities accounted for 5.6% of the total working population by the end of 2004. Since the rate was 6.66% at the beginning of 2002, this indicates a decrease in employment in the sector. When the employed population is analysed, the same conclusion holds: as of December 2004, the number of persons employed in agriculture accounted for 5.36% of those employed in the economy as a whole. In the last quarter of 2003 the employment rate was 5.76%.

**Table 10.5 – Economic indicators: GDP growth by production sector (%)**

	<b>2002</b>	<b>2003</b>	<b>2004</b>
Agriculture	0.4	-0.1	-1.0
Energy	2.3	1.4	2.2
Industry	0.7	0.9	0.7
Construction	6.3	5.1	5.1
Services	2.6	2.8	3.5

Source: National Statistics Institute.

It can be pointed out in conclusion that the value added for every person employed in agriculture is smaller than the country average; the labour drift to other sectors can thus be expected to continue.

## **10.2 – Agricultural and food production, food consumption and trade**

### ***10.2.1 - Agricultural structures and land use***

According to the recently published results of the 2003 Structures Survey, the average size of farms rose by 8.62% since the 1999 Census. Although the census and the surveys are not comparable, these results confirm the trend observed in previous years.

Currently the average size of survey farms is 22.07 hectares of Agricultural Area in Use (AAU), whereas in 1999 it was 20.32 ha.<sup>2</sup> The number of farms has decreased (-11.39%), with the same pattern for every type of land use except vineyards, the number of which increased by 2.16%.

As was pointed out in previous reports, the number of farms in Spain is dropping sharply and the average size of farms is increasing, although still below the EU-15 average. **Tables 6 and 7** give the most important figures resulting from the 1999 Census and the 2003 Survey.

---

<sup>2</sup> Note that Surveys only take account of farms which fulfil one of the following conditions: a) an AAU of over 1 hectare; b) more than 0.2 hectares devoted to vegetables, flowers, nurseries, irrigated orchards or glasshouses; c) an animal farm of a minimal economic size. Only farms fulfilling one of these requirements have been extracted from the 1999 Census for the comparisons made in this report.

**Table 10.6 – Agricultural structures. Comparison of the 1999 Census and the 2003 Survey**

	<b>1999</b>	<b>2003</b>	<b>Variation (%)</b>
Number of farms	1 287 418	1 140 733	-11.39
Total area (ha)	35 205 947	33 314 181	-5.37
Agricultural area in use (AAU) (ha)	26 158 409	25 175 260	-3.76
Cultivated land (ha)	16 790 021	16 649 029	-0.84
Annual crops and fallow land (ha)	12 367 928	12 302 675	-0.53
Fruit crops (ha)	1 133 204	1 095 647	-3.31
Olives (ha)	2 220 266	2 204 396	-0.71
Vineyards (ha)	1 010 074	1 031 892	2.16
Total area/farm (ha)	27.35	29.2	6.79
AAU/farm (ha)	20.32	22.07	8.62
AAU/total area (%)	74.3	75.57	1.71
Cultivated land/AAU (%)	64.19	66.13	3.03

Source : Structural Survey 2003. National Statistics Institute.

**Table 10.7 – Number of farms by size and acreage – 1999 census**

<b>size</b>	<b>Number of farms</b>	<b>% of total</b>	<b>cumulated %</b>
<b>0 - 1 ha</b>	455 424	25	25
<b>1 - 5 ha</b>	643 128	36	61
<b>5 - 20 ha</b>	403 109	23	84
<b>20 - 50 ha</b>	137 010	8	92
<b>50-100 ha</b>	58 994	3	95
<b>&gt;100 ha</b>	66 791	4	99
<b>Total</b>	<b>1 790 200</b>	<b>100</b>	

Note: The total figure includes farms without land.

Source: Agricultural Census 1999. National Statistics Institute.

According to López (2003), there were three factors behind the structural adjustment process. First, the farm closure rate increased during the 1990s. At the same time, land mobility improved, and, finally, changes in land use led to an increase in total AAU – clearly illustrated in Table 10.6 – and consequently an increase in the AAU/Total Area ratio.

With regard to the economic size of farms, it has been observed that the gross margin per hectare of AAU increased sharply as measured in European Size Units, from 0.37 ESU/hectare in 1989 to 0.59 ESU/hectare in 1999,<sup>3</sup> i.e. an annual rate of variation of 4.9% over the decade. Two elements explain this improvement: i) yields increased, and ii) the evolution of prices and subsidies led to a rise in the gross margin per physical unit. The gross margin per farm more than doubled over the 10-year period, increasing from 4.0 to 8.7 ESU per farm.

As for the overall evolution of land use, as illustrated in **Table 8**, the main change in cultivated land is a shift from cropland (both annual and perennial crops) to fallow land between 2002 and 2003. There was a remarkable percentage rise in irrigated fallow land. The forestry area also increased, with an internal shift from underutilised forest resources (low density forests with scant economic profits) to other types of more productive forests.

**Table 10.8 – Land use in Spain (1000 ha)**

	Rain-fed		Irrigated		Total	
Use	2002	2003	2002	2003	2002	2003
Annual crops	7 591.4	7 497.0	2 180.7	2 167.3	9 772.1	9 664.3
Set-aside, fallow and idle	3 020.8	3 158.5	174.3	194.6	3 195.1	3 353.1
Perennial crops	3 859.3	3 846.2	1 117.8	1 117.6	4 977.1	4 963.7
<b>Total cropland</b>	<b>14 471.5</b>	<b>14 501.6</b>	<b>3 472.8</b>	<b>3 479.5</b>	<b>17 994.2</b>	<b>17 981.1</b>
Natural meadows	1 261.5	1 253.5	317.7	292	1 579.2	1 545.5
Pastureland	5 658.7	5 548.2	-	-	5 658.7	5 548.2
<b>Total pastures &amp; meadows</b>	<b>6 920.1</b>	<b>6 801.7</b>	<b>317.7</b>	<b>292</b>	<b>7 237.8</b>	<b>7 093.7</b>
Woody forests	7 557.2	7 613.7	-	-	7 557.2	7 613.7
Low-density forest	4 297.1	4 246.1	-	-	4 297.1	4 246.1
Firewood forest	4 638.3	5 007.3	-	-	4 638.3	5 007.3
<b>Total forests</b>	<b>16 492.7</b>	<b>16 867.2</b>	-	-	<b>16 492.7</b>	<b>16 867.2</b>
<b>Other land</b>	<b>8 857.3</b>	<b>8 594.8</b>	-	-	<b>8 857.3</b>	<b>8 594.8</b>
<b>Total area</b>	<b>4 6741.5</b>	<b>4 6765.3</b>	<b>3 790.5</b>	<b>3 771.5</b>	<b>50 532.0</b>	<b>50 536.8</b>

Barley is the most important crop in acreage, with more than 3 million hectares. This crop, like the other winter cereals, is sown mainly in the interior regions of the

<sup>3</sup> The ESU equivalent in ECU (euros) increased in that time span. Some researchers therefore “correct” raw data in order to compare results. We have not done so in our analysis.

Iberian Peninsula. Olives are the second crop in acreage, used mainly for oil production with a smaller share devoted to table olives. Although this tree crop is distributed over the entire Peninsula and the Balearic Islands, the main plantations are in Mediterranean regions such as Andalusia, Valencia and Catalonia.

Other important crops for the Mediterranean regions can be classified under two headings: on the one hand, vineyards and nuts are traditional perennial crops, as is the case in other Mediterranean countries, and account for a significant share of the total agricultural acreage. The development of these two crops has varied over the past few decades. In general terms, vineyards have been undergoing an on-going process of modernisation and crop intensification, while the nuts acreage (almonds being the most important in terms of cultivated area) has been decreasing as has their share in national agriculture. They are now mainly grown in mountainous and dry areas which are unsuitable for more profitable crops. On the other hand, citrus fruits and horticultural products are core products of the successful Spanish agricultural exports (see 10.2.5), although they are less significant in terms of acreage. **Table 9** shows acreage figures based on MAFF (Ministry of Agriculture, Forestry and Fisheries) data.

**Table 10.9**

	<b>Acreage 1000 ha</b>		
	<b>2003</b> <i>(def.)</i>	<b>2004</b> <i>(prov.)</i>	<b>2005</b> <i>(est.)</i>
durum wheat	913.2	910.7	882.1
common wheat	1 307.5	1 240.8	1 273.5
barley	3 110.9	3 170.4	3 166.7
maize	476.1	479.7	430.0
rice	118.3	121.3	112.1
other cereals (oats, rye, triticale, sorghum)	652.3	615.7	609.6
total cereals	6 578.3	6 538.6	6 474.0
potatoes	101.1	97.1	95.3
sugar beet	99.8	102.5	102.1
sunflower	786.8	749.6	628.8
other: pulses	566.7	573.9	578.2
fodder (fodder maize, <i>vicia sativa</i> , alfalfa)	401.3	399.1	
lettuce	37.7	37.5	
watermelons	16.0	16.3	16.0
melons	38.9	38.1	35.4
tomatoes (fresh+industrial)	93.6	107.1	
peppers	22.4	21.8	
onions	21.3	22.8	22.5
oranges	136.8		
mandarins	118.6		
lemons	47.4		
apples	46.0		
pears	38.1		
peaches	78.5		
almonds	641.7		
bananas	9.6		
table grapes	22.7		
wine grapes	1 142.4		
table olives	168.7		
oil olives	2 270.8		
other tree crops: apricots, cherries and plums	69.8		

Source: MAFF.



### **10.2.2 - Agricultural production and prices**

As of September 2004, the Spanish administration had not made official data on agricultural results in 2004 available (with the exception of the total sector growth and labour data); there are therefore no data on agricultural income, on intermediate consumption, or on the differences between animal and crop husbandry.

It can be pointed out as a general comment that crop husbandry recovered from the very bad 2003 farm year. In fact, since the weather conditions were more favourable for agriculture in 2004, good yields brought a significant increase in the production of many cereals. The same holds for pulses, industrial crops, potatoes and fodder crops. Since vegetables were less affected by weather conditions, there were changes in both directions, the most outstanding being increases in tomato and onion production and a marked decrease in lettuce output.

On the other hand, the total output of tree crops decreased in general, with the exception of bananas and mandarins. The most marked decreases concerned oil olives, apples, pears and peaches. Due to the drought which has affected practically the entire Iberian Peninsula the preliminary harvest estimates for 2005 are very bad for most crops.

With regard to animal husbandry, there was a general drop in the total output of meat in 2004, with minor reductions in every sub-sector. All of these figures are set out in **Tables 10 and 11**.

**Table 10.10 – Evolution of main products 2003-2005**

	output 1000 T		
	2003 (def.)	2004 (prov.)	2005 (est.)
durum wheat	1 989.1	2 714.6	1 151.3
common wheat	4 029.9	4 393.3	3 601.1
barley	8 693.9	10 608.7	6 370.7
maize	4 355.0	4 765.9	n.a.
rice	861.9	900.4	n.a.
other cereals (oats, rye, triticale, sorghum)	1 173.4	1 312.9	890.3
total cereals	21 103.2	24 695.8	12 013.4
potatoes	2 665.0	2 745.4	
sugar beet	6 365.1	7 015.2	
sunflower	762.5	785.3	
other: pulses	519.5	588.7	409.8
fodder (fodder maize, <i>vicia sativa</i> , alfalfa)	16 679.6	17 708.6	
lettuce	1 044.7	967.1	
watermelons	733.0	764.6	
melons	1 071.2	1 102.4	
tomatoes (fresh+industrial)	5 493.7	6 608.8	
peppers	1 056.2	1 006.0	
onions	936.8	1 083.7	
oranges	3 052.2	2 713.5	
mandarins	2 060.4	2 457.7	
lemons	1 129.6	737.5	
apples	888.1	603.0	
pears	143.8	122.4	137.3
peaches	1 270.8	916.5	1 078.7
almonds	214.4	86.4	201.8
bananas	402.1	412.7	412.0
table grapes	320.6	331.0	
wine grapes	6 927.6	6 955.3	
table olives	498.7	439.2	
oil olives	7 058.9	4 526.7	
other tree crops: apricots, cherries and plums	482.1	330.7	445.9

Source: MAFF.

**Table 10.11 – Evolution of animal products, 2002-2004**

	<b>slaughters (1000)</b>			<b>meat output (1000 T)</b>		
	<b>2002</b>	<b>2003</b>	<b>2004 <i>estimate</i></b>	<b>2002</b>	<b>2003</b>	<b>2004 <i>estimate</i></b>
meat						
beef	2 692.4	2 763.1	2 683.9	676.1	706.4	702.3
sheep	20 950.7	20 782.2	20 214.1	237.1	236.2	231.5
goat	1 829.7	1 684.6	1 603.7	15.1	13.9	13.4
pork	37 023.5	38 180.1	37 834.6	3 070.1	3 189.5	3 175.6
horse	29.8	24.1	24.0	5.7	4.8	4.8
poultry	700 022.0	701 587.0	692 398.0	1 331.7	1 333.3	1 300.7
rabbit	96 353.0	90 300.0	87 655.0	119.0	111.6	106.6
other						

	<b>output (1000 T)</b>		
	<b>2002</b>	<b>2003</b>	<b>2004 <i>estimate</i></b>
milk			
cow's milk	6 610.4	6 632	
ewe's milk	420.5	421.5	
goat milk	528.5	528.4	
other			
eggs*	971 592		
other			
* in 1000 dozens			

	<b>cattle (1000 head)</b>		
	<b>2002</b>	<b>2003</b>	<b>2004 <i>estimate</i></b>
cattle	6 487.8	6 551.3	
sheep	23 813.2	23 485.9	
goats	3 046.7	3 162.056	
pigs	23 517.2	24 097.543	
laying hens			
other			

Source: MAFF.

As regards prices paid to farmers (see **Table 12**), the prices of animal products rose by 2.70%, while crop product prices dropped by 0.25 percentage points. In the crop area, there were significant increases in potato, industrial crop, fodder crop, flower, nuts and olive oil prices, whereas the prices of wine, pulses and non-citrus fruits dropped. Wine producers are facing an unprecedented crisis with real prices declining yearly, and if this situation continues over the next few years a decline in output and in the number of farms is to be expected.

**Table 10.12 – Farm gate prices, 2002-2004**

price .....€/T	2002	2003	2004 <i>estimate</i>
wheat	134,10	138	141,50
barley	118,20	121,50	128,30
maize	137	147,90	148,70
rice	275,10	274,80	207,90
other cereals: oats	126,20	123	125
other cereals: rye	122,20	142,90	124,20
other cereals: sorghum	128,20	147,20	138,80
potatoes	163,20	212,50	221,90
sugar beet	51,50	58,80	60,80
sunflower	261,40	216,50	229,90
fodder: alfalfa	118,30	111,10	118,40
lettuce	381,50	476,60	321,50
watermelons	191,60	302,30	175,80
melons	235,50	316,70	297,40
tomatoes	459,70	490,90	412,10
peppers	603,90	782,30	836,60
onions	147	165,90	161,80
oranges	199,70	191	210,60
mandarins	271,80	266,60	255,1
lemons	233,90	252,40	212,9
apples	319,80	350,40	314,5
pears	419,60	503,50	472,8
peaches	491,70	628,40	625
apricots	419,30	730,70	744
almonds	686,80	919,30	1 348,6
bananas	273,80	299,90	248,7
table grapes	433,10	428,40	414,1
white wine*	2,79	2,97	2,43
red wine*	5,30	5,75	3,98
table olives	462,20	495,60	516,7
oil olives	352,50	333,80	426,7
olive oil	1 913,80	2 190,20	2 387,4
other: beans	1 461,50	1 400,20	1 228,9
other: plums	412,50	617,80	662,4
other: cherries	1 164,40	1 593,70	2 339,1

**Table 10.12 (contd.)**

	price .....€/T		
	2002	2003	2004 <i>estimate</i>
veal (beef < 1 year)	1 951,70	1 947,80	1 863,20
beef (> 2 years)	860,50	815,80	795,50
sheep (< 1.5 months)	3 756,70	3 720,50	3 864,50
goat (< 1.5 months)	4 516,10	4 536,50	4 378,70
pigmeat	1 037,40	968	1 048,60
poultry	741,50	835,90	857,10
rabbit	1 395,70	1 827,90	1722,20
milk			
cow's milk**	29,50	29,53	31,88
ewe's milk**	77,90	77,35	77,25
goat milk**	45,76	45,63	48,34
eggs ***	76,46	90,23	85,05
other			

\* prices in €/hectograde

\*\* prices in €/100 litres

\*\*\* prices in €/100 dozen

Source: MAFF.

In the animal product field, beef, goatmeat, rabbit and egg prices diminished, with higher increases for milk and pigmeat.

With regard to prices paid by farmers, the price of every input rose on a yearly basis. As a whole, only animal feeding stuffs showed moderate price rises (less than 5% in general), while the highest increase occurred in fuel prices (which increased by 11.46 percentage points yearly). Item-by-item indexes are shown in **Table 13**.

Several estimates made by farmers' organisations conclude that fuel accounts for about 10% of total costs in agriculture. As has been the case in other sectors highly dependent on this input (such as transport), this resulted in farmer demonstrations during the second half of 2004 putting pressure on the government because of fuel price increases. The organisations and the government eventually came to an arrangement consisting of compensation in the form of €170 million in aid to farmers. Since oil prices have continued to rise in 2005, several voices have been raised calling for a reduction or total elimination of the specific tax burdening fuels in Spain when the fuel is purchased by the transport, fisheries or agricultural sector (the so-called "professional uses of fuel").

**Table 10.13 – Price of main inputs, indexes 2002-2004**

	unit	index 1995=100 (except*)		
		2002	2003	2004 <i>estimate</i>
unskilled labour*	1985=100	286.65	291.92	300.19
skilled labour: tractor operator*	1985=100	292.96	289.54	298.43
non-irrigated land	1995=100	194.4		
irrigated land	1995=100	174.1		
seeds	1995=100	132.85	141.65	147.91
plants	1995=100	137.86	121.69	132.77
fuel	1995=100	154.99	161.88	180.43
transport	1995=100			
nitrogenous fertilisers	1995=100	115.69	115.77	124.55
phosphate fertilisers	1995=100	106.89	110.03	116.65
potassium	1995=100	114.12	116.63	118.65
other: compound fertilisers	1995=100	106.57	106.47	108.64
pest control products	1995=100	117.29	119.41	120.58
veterinary services	1995=100	140.55	131.64	145.26
hired labour	1995=100			
soil preparation	1995=100	128.15	130.4	134.97
tractor rent	1995=100			
combine harvester rent*	1985=100	282.3	297.7	297.85
fodder	1995=100	108.56	104.54	109.09
concentrated feed	1995=100	100.65	101.14	104.5
cattle feed	1995=100	104.04	103.34	103.36
sheep and goat feed	1995=100	102.63	100.88	103.08
pig feed	1995=100	99.84	99.8	104.83
poultry feed	1995=100	98.58	100.87	104.57
irrigation water	1995=100			
short-term interest rate	1995=100			
long-term interest rate	1995=100			

Source: MAFF.

### **10.2.3 - Food industries**

2004 can be described as a transitional year for the agro-food industry: on the one hand, the production of agro-food industries grew by 1.6% in real terms, less than the 3% increase observed in 2003. On the other hand, the number of firms dropped by 2% in a context of a 5% increase in the number of firms in the overall economy. Simultaneously, agro-food employment increased by 1.76 percentage points. These figures seem to indicate consolidation of corporate structures.

The sector is quite significant in the total economy: its total output accounts for about 8.15% of Spanish GDP; it generates 2.51% of total Spanish employment and 13.89% of industrial employment. Another indicator of the importance of the sector is its ability to attract FDI: in a context of year-to-year decreases in FDI in Spain, the sector has been able to increase FDI due to its competitiveness and good export performance. In 2004, the FDI attracted by agro-food industries accounted for some 34% of the total FDI attracted by Spanish industries. The sector also invests in other countries: €572 million were invested in foreign countries in 2004, the other EU-25 member states (51.26%) and Latin America (45.74%) being the main recipients of Spanish agro-food FDI.

The sector's export-import ratio is 88% (exports amounting to €13.108 billion and imports to €14.900 billion); this is better than the figure for the economy as a whole, but worse than the agricultural balance. The deficit observed, although significant in value, is improving in a dynamic perspective: it currently accounts for less than 3 % of the country's total trade deficit, whereas it was 4.40% in 2002.

**Table 14** shows the evolution of output Over the last 15 years, while **Table 15** contains figures on the size of the agro-food industries in 2004 in terms of employees. As was pointed out in last year's report, one of the main characteristics of the industrial sector in Spain is the relatively high percentage of small and medium-sized enterprises. As a matter of fact, in the agro-food sector only 3.3% of firms have more than 50 employees. Many of Spanish agro-food firms are family-owned and managed. These firms tend to concentrate mainly on the domestic market – a fact which is a shortcoming in a global market and a disadvantage for the future performance of firms.

**Table 10.14 – Gross output of the agro-food industry**

Variation in production (%)				
	Value (million €)	Quantity	Current prices	Constant prices
1989	35 574	1.4	6.4	-0.4
1990	37 263	5.6	4.7	-2.1
1991	39 486	3.2	6	0.1
1992	41 350	2.6	4.7	-1.3
1993	42 239	-6.1	2.2	-2.6
1994	44 415	1	5.2	0.5
1995	47 402	0.7	6.7	2.1
1996	49 553	1.3	4.5	1
1997	52 697	5.6	6.3	4.4
1998	53 628	3.5	1.8	0
1999	54 380	-0.3	1.4	-0.9
2000	55 023	-1.1	1.2	-2.9
2001	56 255	-2.5	2.2	-0.5
2002	58 864	3.6	4.6	0.7
2003	62 116	2.8	5.5	3
2004(*)	65 075	2	4.8	1.6

\* Estimate

Source: FIAB (Spanish federation of food and beverage industries)

**Table 10.15 – Number of agro-food industries, 2004**

	Number of employees	0	1 to 9	10 to 49	50 to 199	200 to 499	> 500	Total
<b>Whole economy</b>	Number	1 500 396	1 265 349	151 512	20 120	3 590	1 616	<b>2 942 583</b>
	%	50.99	43	5.15	0.68	0.12	0.05	<b>100</b>
<b>Total industry</b>	Number	76 754	125 988	38 282	5 774	1 076	415	<b>248 289</b>
	%	30.91	50.74	15.42	2.33	0.43	0.17	<b>100</b>
<b>Agro-food industry</b>	Number	8 879	17 658	4 977	820	185	67	<b>32 586</b>
	%	27.25	54.19	15.27	2.52	0.57	0.21	<b>100</b>

Note: Data relate to 1 January 2004.

Source: FIAB.

The meat, alcoholic beverages and dairy product sub-sectors are those producing higher production values. In contrast, employment is distributed more evenly, but



the bakery and meat sub-sectors account for almost half of total employment (see **Table 16**).

**Table 10.16 – Sub-sectors of the agro-food industry: employees and gross production**

	Employees (thousand persons)		Gross production (million current €)	
	2002	2003	2002	2003
Meat industries	88	91	11 581	12 294
Fish industries	27	27	2 858	3 054
Processed fruits and vegetables	37	38	4 160	4 635
Oils and fats	14	13	5 046	4 802
Dairy products	31	31	6 413	6 498
Grain-mill products	8	8	2 000	2 057
Animal feed	18	18	5 393	6 083
Bread, pastry, biscuits	104	102	4 190	4 622
Sugar, cocoa and chocolate	23	22	2 772	2 823
Other food	27	27	2 848	3 302
Alcoholic beverages	43	43	7 869	7 809
Water and non-alcoholic beverages	17	17	3 734	4 136
<b>Total</b>	<b>437</b>	<b>438</b>	<b>58 864</b>	<b>62 116</b>

Source: FIAB. 2004 data not available.

#### **10.2.4 - Food consumption**

According to MAFF panel data, total food expenditure amounted to €74.752 billion in 2004, which was 7.7% higher than in 2003 in current terms and 4% in real terms. Every household spent €1 292 per capita, accounting for a total of €54.231 billion. In 2004, expenditure in the hotel and catering industry was the main factor responsible for the growth in total food expenditure, which increased by 9.9 % compared to 2003 (approx. €19.2 billion).

It can be concluded on the basis of the Household Budget Survey that some 20.22% of total household expenditure – in current terms – is devoted to food, beverages and tobacco.<sup>4</sup> In 2004, the total expenditure of Spanish households amounted to €82.397 billion, €16.661 billion being devoted to food, beverages and tobacco consumption. According to FIAB calculations based on this survey, the average

<sup>4</sup> These figures only take account of in-home expenditure; restaurants and other forms of household expenditure are not included.

expenditure for each household was €1 147 and €393 per person for these commodities respectively.

### **10.2.5 - Agro-food trade**

Agricultural exports account for about 15.7% of total Spanish exports – with a slight drop compared to 2003 –, while the share of agro-food imports in total imports remains below 10 %. Total agricultural trade expanded to a lesser extent than total trade, thus reducing its share in national trade. The sectors with higher increases in trade figures – both exports and imports – are raw materials, equipment and industrial goods. As regards consumer goods, Spanish exports decreased in value throughout 2004 compared to 2003, while imports rose above 8%.

Whereas Spain's total trade balance shows a deficit, the agro-food trade balance has shown positive results during the last few years. It is at all events worthy of note that the export-import ratio of agro-food products decreased in 2004 to 106.99% (it was 113.05% in 2003). This deterioration was due to the fact that exports grew by 1.1% while imports grew by a significant 6.8%. The total figures indicate that agro-food exports amounted to €21 524.9 million, whereas agro-food imports amounted to €20 118.5 million.

The EU is the main agricultural trading partner. In 2004, exports to the current EU-25 amounted to €17 788.2 million (82.64% of total agricultural exports). On the other hand, the EU-25 is the origin of only 60% of Spanish agro-food imports. These trade data are set out in **Tables 17 and 18**.

**Table 10.17 – Total and agricultural external trade, 2003-2004**

	2003	2004	2004
	million €		variation (%)
All products			
Exports	138 119.0	146 452.1	6.03
Imports	185 113.7	207 125.5	11.89
Agricultural products	21 294.5	21 524.8	1.08
Exports	18 836.4	20 118.5	6.81
Imports			

Source: Own elaboration from Ministry of Economic Affairs data.

**Table 10.18 – Agricultural external trade by destination, 2003-2004**

	2003	2004
	million €	
All countries		
Exports	21 294.5	21 524.8
Imports	18 836.4	20 118.5
EU-25 countries		
Exports	17 709.854	17 788.197
Imports	11 175.374	12 006.129

A breakdown of data for agricultural, fisheries and forestry trade is shown in **Table 19**, which allows more detailed evaluation of exports and imports, highlighting several important factors. First, the two main export categories, in terms of economic significance, are fresh fruit and fresh vegetables, both of which decreased in value compared to the 2003 performance. As total exports have increased in value, it can be said that the composition of the Spanish agriculture, fisheries and forestry export portfolio is becoming more balanced and less dependent on the results in these two key sectors. At all events, it could be of advantage for private and public agents in Spain to analyse the future trend of fruit and vegetable exports.

**Table 10.19 - Agricultural, fisheries and forestry external trade by category, 2003-2004**

	<b>2003</b>		<b>2004</b>	
	<b>Imports</b>	<b>Exports</b>	<b>Imports</b>	<b>Exports</b>
	<b>million €</b>	<b>million €</b>	<b>million €</b>	<b>million €</b>
Live animals	386.45	259.61	334.48	283.7
Meat and edible meat offal	790.04	1 473.33	833.9	1 719.26
Fish and crustaceans; molluscs and other aquatic invertebrates	4 086.53	1 595.42	3 942.11	1 688.24
Dairy products; birds' eggs; natural honey	1 213.02	724.31	1 351.05	702.5
Products of animal origin, not elsewhere specified or included	86.58	76.65	98.13	96.17
Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage	192.89	211.35	186.78	212.47
Edible vegetables and certain roots and tubers	634.16	3 452.06	831.98	3 328.38
Edible fruit and nuts; peel of citrus fruit or melons	1 069.68	4 549.77	1 228.82	4 285.88
Coffee, tea, mate and spices	335.53	127.61	339.06	130.19
Cereals	1 292.22	401.47	1 350.56	308.07
Grain-mill products; malt; starches; inulin; wheat gluten	88.76	153.77	92.16	160.7

**Table 10.19 (contd.)**

	<b>2003</b>		<b>2004</b>	
	<b>Imports</b>	<b>Exports</b>	<b>Imports</b>	<b>Exports</b>
	<b>million €</b>	<b>million €</b>	<b>million €</b>	<b>million €</b>
Oil seeds and oleaginous fruits, miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	1 129.62	179.95	1 130.57	166.98
Lac; gums, resins and other vegetable saps and extracts	63.02	126.14	70.78	120.47
Vegetable plaiting materials; vegetable products not elsewhere specified or included	10.55	7.72	10.77	7.16
Animal or vegetable fats and oils and their derivatives; prepared edible fats, animal or vegetable waxes	471.84	1 595.57	597.04	1 944.47
Meat preparations; fish preparations or preparations of crustaceans, molluscs or other aquatic invertebrates	425.85	601.6	424.57	599.77
Sugars and sugar confectionery	460.05	381.61	463.26	344.31
Cocoa and cocoa preparations	430.57	229.52	425.89	222.40
Cereal, flour, starch or milk preparations; pastrycook's products	633.9	554.32	717.56	596.32
Vegetable, fruit or nut preparations or preparations of other parts of plants	537.21	1 622.09	576.68	1 569.60
Miscellaneous edible preparations	851.47	579.53	909.5	600.28
Beverages, spirits and vinegar	1 465.07	2 085.21	1 590.73	2 114.02
Residues and waste from the food industries; prepared animal fodder	982.22	306.31	1 176.60	304.69
Tobacco and manufactured tobacco substitutes	1 324.22	157.36	1 565.72	168.95
Leather	708.24	522.44	551.32	474.03
Wood and charcoal	2 095.76	817.01	2 121.76	878.52
Cork	138.55	289.82	121.38	260.35
Wood pulp	431.71	395.24	429.76	475.78
Wool, fine or coarse animal hair, horsehair yarn and woven fabric	160.06	180.17	158.15	177.62
Cotton	625.1	796.47	630.78	833.48
Other vegetable textile fibres; paper yarn and woven paper yarn fabrics	90.69	41.55	83.55	42.97
<b>Total agricultural trade</b>	<b>23 211.6</b>	<b>24 494.98</b>	<b>24 345.4</b>	<b>24 817.73</b>

Source : Own elaboration from Ministry of Economic Affairs data.

The most important products in terms of export value – apart from fresh fruits and vegetables - improved their performance in 2004 compared to 2003, with the exception of vegetable preparations. These commodities - meat, fish, fats and beverages - seem to be consolidating their competitiveness. On the other hand, relatively marked slowdowns - in terms of exports - were registered in the case of several products such as cereals, sugar and confectionery, dairy products and leather, which belong to the intermediate-value category of exports.

As far as imports are concerned, fishery products are the main commodity, accounting for over 16% of imports expenditure. Wood, beverages, tobacco, dairy products, fruit, oilseeds and cereals are also particularly significant. Of these major commodities, tobacco, fruit and dairy product imports rose sharply, the value of fish imports being the only item where a decrease was registered.

An interesting point to be underlined is the difference observed depending on the origin of the products traded. Forestry products account for 11.63% of imports and only 7.22% of exports. The situation is similar in the case of fishery products: as mentioned, their share in imports is quite significant (16.19%), contrary to their share in exports (6.80%). Trade in animal-based products is fairly balanced – about 15% of total imports and exports – despite unbalanced net results in several sub-sectors such as dairy products.

### **10.3 – Agriculture and agro-food policies**

#### ***10.3.1 - The MTR in Spain***

The Mid-Term Review (MTR) of the Common Agricultural Policy of June 2003 has clearly been the most important event in the definition of agricultural policies in Spain in recent years. Its scope has been broadened since April 2004, when the tobacco, cotton, hops and olive oil sectors were reformed in line with the same decoupled-payments approach.

In 2005 and 2006 countries will be allowed to retain part of the payments linked to production (partial decoupling) in order to avoid abandonment of production in several areas. Last year the CIHEAM Annual Report elaborated on many aspects of the reform, including the various options chosen by each Mediterranean EU-15 member state (CIHEAM, 2005). Spain will not be applying the single payment scheme until 2006, as is the case with France, Greece, the Netherlands and Finland. In the following paragraphs we summarise the MAFF proposals (October 2004) concerning the application of the MTR to the new reform items on the basis of central government assessment and decisions.

- Individual historical reference (the reference years being 2000, 2001 and 2002), instead of the regional calculation models used in Germany, Finland, Denmark, Luxembourg and Sweden.
- Partial decoupling for arable crops, 25% of the payment being coupled. The reason for this option is the tremendous importance of arable crops in terms of land use (about 40% of AAU), together with the difficulty in finding alternatives in several areas, and the fact that they complement tree crops and extensive husbandry in other areas. At all events, the Ministry underlines the importance of

arable crops for maintaining economic activity and is therefore trying to maintain production incentives.

- A reduction in the compulsory set-aside area with a view to maximising entitlements (since the set-aside area does not affect the *calculation of entitlements* but does affect the *aid received*).
- For the beef sector the Commission proposes three partial decoupling alternatives. One is to keep the suckler cow premium 100% coupled, together with the 40% coupling of the calf premium and 100% coupling of the adult animal premium. The other two options (100% coupling of the adult animal premium or 75% coupling of the male premium) are not compatible with this option.
- The payment for suckler cows will thus remain completely coupled to production. The reason is that the most Spanish farms are located in mountainous areas and employ an extensive or semi-extensive regime with some indigenous breeds. They thus help to fix the population and occupy land in rural areas with special characteristics and to preserve bio-diversity. Furthermore, since Spain has a deficit in calves brought to abattoirs, the government wants to prevent more dependence on foreign mothers. The higher level of coupling has been chosen for these reasons.
- As a result, the adult animal premium has been kept at its maximum level of 40% and the calf premium has also been maintained at the 100% level of coupling.
- Spain is also trying to maximise the level of coupling for the sheep and goat sector, where it is fixed at 50%. Since most meat farms are profitable because of CAP payments, the maximum level of coupling could help them to continue in the production sector. As is the case with the other sectors mentioned, rural development and territorial concerns are key factors in the choice of this option.
- The new olive oil regulation allows countries to receive 40% of the total payment as a per-hectare payment, and the other 60% is a decoupled payment. The MAFF has proposed to decouple payment at the rate of 90%, together with a new per hectare payment that takes account of the social, environmental, landscape and technical aspects of farms; 5 olive grove categories are thus being defined.
- With regard to tobacco, Spain will be keeping the maximum coupled rate of 60% from 2006 to 2009 in order to maintain production in the specific areas where the crop is grown as long as possible.
- The MTR has integrated 65% of the payment for cotton into the single payment scheme. The other 35% will be a per-hectare payment with a maximum guaranteed area. In order to avoid behaviour geared solely to obtaining premiums, the Spanish ministry is encouraging the modulation of aids according to the quality of the product.
- The dairy premium will be incorporated into the single payment regime in 2006, since, according to official MAFF memoranda, there was nothing to gain by bringing it forward to 2005.
- With regard to the possibility for countries to reduce the decoupled payments by up to 10% and devote the budget thus saved to quality and environmental programmes – Article 69 of Regulation 1782/03 – Spain has expressed its intention to make use of it, although the reduction rate is not yet clear.

To sum up, it can be said in general that Spain is trying to minimise the impact of total decoupling on its farms, since the administration argues that this is the best way to preserve activity in areas less suitable for crop and animal husbandry. This strategy could be of advantage in the transitional period, but national policies should plan for the long term in order to prevent the undesired effects of total decoupling.

### **10.3.2 - EAGGF transfers**

The data available on EAGGF guarantee transfers indicate a minor increase in the funds received by Spain. The 2004 increase is due mainly to increases in the rice, wine, fruit and vegetables and milk sector transfers. **Table 20** gives a sector-by-sector breakdown. As can be observed in the table, over 25% of the total funds received are devoted to arable crops, whereas 15.5% of funds go to the olive oil sector, the beef sector being the destination of almost 12% of total transfers.

There are three typical Mediterranean activities of importance in Spanish agriculture which account for about 7% of the total funds received: sheep and goat husbandry, fruit and vegetable production, and wine and alcoholic beverages production. Some 7% of total funds were also allocated to rural development schemes.

The breakdown according to type of expenditure indicates that the bulk of the funds (€5.029 billion) took the form of direct payments to producers, €856 million were payments to industries and other private entrepreneurs and middlemen, €33 million were devoted to financing private food stocks, €44 million were devoted to the free distribution of food and €17.5 million to quality improvement and market promotion of olive oil.

Rural development plans accounted for €507.5 million, refunds and other trade facilities accounted for €183.7 million, and expenditure on public stocking amounted to €78.8 million.

**Table 10.20 – EAGGF Guarantee transfers, 2003-2004**

Item	Unit: million €	2003	2004
Total arable crops	Total	1 827.82	1 824.60
	Cereals+ other arable crops	1 172.48	1 589.60
	Durum wheat	211.80	195.48
	Protein seeds	47.48	11.93
	Non-textile flax	0.41	0.21
	Oilseeds	151.09	7.97
	Set-aside	246.04	20.98
Other cereal subsidies	Total	-4.84	-6.62
	Export refund	2.06	0.47
Rice	Total	33.30	123.27
	Per-hectare aid	12.24	98.39
	Export refund	4.50	2.67
Pulses and fodder	Total	162.93	241.53
Sugar	Total	38.82	49.44
	Export refund	20.87	22.44
Cotton	Total	168.22	266.25
Textile flax and hemp	Total	0.15	-0.16
Tobacco	Total	113.38	106.02
Olive oil	Total	1 064.71	1 043.18
	Production subsidies	990.85	968.88
	Export refund	0.06	0.00
Wines and alcohol	Total	432.95	471.77
	Vineyard modernisation	167.13	180.01
	Distillation	173.81	182.36
	Export refund	12.55	10.26
Fruit and vegetables	Total	475.30	496.10
	Operative Funds	117.01	121.31
	Export refund	8.32	9.23
Beef	Total	859.28	806.75
	Suckler cow premium	323.71	305.45
	Calf premium	133.22	133.77
	Extensification premium	154.14	157.06
	Export refund	47.65	19.28
Pork	Total	16.43	6.60
	Export refund	2.71	2.64
Sheep and goat	Total	496.69	512.26
	Sheep and goat premium	369.65	377.62
Milk and dairy products	Total	57.68	116.07
	Export refund	22.19	37.45
Eggs and poultry farming	Total	0.33	0.29
Accompanying measures/ Rural development EAGGF - Guarantee Section	Total	494.61	507.46
	Retirement	44.25	44.73
	Agro-environment	121.96	133.27
	Forestation	90.55	80.30
Fishing products	Total	3.12	6.77
<b>TOTAL EAGGF Guarantee Transfers</b>		<b>6 374.89</b>	<b>6 707.65</b>

Source: FEGA (Spanish Agricultural Guarantee Fund) (2005 and 2004).



### **10.3.3 - National policies**

National policies currently focus mainly on insurances and water and other inputs – such as fuel – but new lines of policy targeting other national specific goals are expected to be developed. For example, as we mentioned in last year's report, a White Paper on Spanish Agriculture has been issued and problems are now clearly identified; since the MTR allows a certain amount of leeway for national tailoring of the CAP, the government should prepare plans for cases of low yields and mountain areas which could be damaged by the forthcoming full decoupling.

With regard to the “traditional” focal areas, the agricultural insurance policy is one of the most developed agricultural insurances in the world. It consists of a mixed system, in which public institutions are responsible for the technical regulations, premiums and general design and control, while the actual insuring is carried out by private companies. According to the general figures on the 2004 Agricultural Insurances Plan, the number of policies contracted has grown by 3%, whereas the number of tonnes insured increased by 6%. Thus, the total cost of insurances rose to €523.2 million, 5 % higher than in the 2003 Plan.

These figures confirm the sound position of the schemes included in the Plan, schemes which are extended and further developed from year to year as new needs are identified by insurance designers. “Yield insurances” have been introduced in recent years for olive groves and other fruits, for example, insurances for farms as a whole with different crops, aquaculture insurances, fire insurances on agricultural land devoted to forest uses and insurances covering the removal of dead animals on livestock farms.

The breakdown of insurance costs in 2004 is as follows, by activity insured: non-citrus fruit insurances are at the top of the list accounting for almost 20% of total costs, despite the general reduction in the main fruit crop production in 2004 (see section 2.2 above). The second in rank in terms of total cost of insurance, is the above-mentioned insurance for covering the removal of dead animals on stock farms (the total cost of this insurance was €82 million). Total expenditure on arable crop, vineyard and cattle insurances amounted to some €70 million for each category. The other two major types of insurance in terms of total cost are the various citrus fruit schemes and the vegetable and flowers insurances.

As regards claims, reported in 2004, 603 000 hectares were affected by risks, with over 85 000 claims reported. As a result, the total payments to farmers amounted to €297.8 million, of which 69% concerned crop husbandry policies and 31% animal husbandry policies.

Hailstones were the hazard with the most marked effect, concerning 343 000 hectares and 45 000 claims. Drought was of little significance in 2004 insurances, causing only 700 claims with 3 000 hectares damaged. The first insurance data for 2005 indicate that drought will cause more damage in 2005. Frost also caused

considerable damage on many fruit farms in 2004, and this damage is also expected to increase significantly in 2005.

As for water policies, in last year's report we mentioned the heated debate on the water transfers between rivers that were approved by the 2001 National Hydrographical Plan. These discussions concerned political, economic, environmental and regional issues and also involved the EU, since it had to co-finance most of the infrastructures. The new government finally decided to cancel the main transfer – from the river Ebro to areas in the south-east because of the “lack of sound environmental and economic analysis”. Since certain public works had already been awarded, the government had to pay compensation.

Furthermore, right-wing parties and public opinion in the south-eastern regions were (and still are) very critical of the decision. The alternatives chosen by the current government rely on the desalination of sea water, water management and water saving. As a part of this water strategy, the previous National Irrigation Plan has been maintained with a view to modernising the existing irrigation systems and introducing new irrigated areas by 2008. Total investment exceeds €5 billion, to be split between private investors (approx. 40%) and public administrations (30% regional governments and 30% national government).

## **11 Algeria**

### **11.1 - Evolution of the national economy in 2004 and outlook**

The economic growth observed since 2001 continued steadily in 2004, although the rate (5.2%) was lower than the rate achieved the previous year (6.9%). If the hydrocarbon sector is not included, the rate was 6.2%, and if both the hydrocarbon sector and agriculture are excluded, the economic growth rate was 6.8%. The other economic sectors were thus relatively dynamic, contrary to what was observed in previous years. The building and civil engineering sector in particular was stimulated by high demand and thus achieved a rate of 8% (compared to 5.5% in 2003), accounting for 32% of growth in GDP. With a growth rate of 7.7%, the services sector achieved the highest rate after the building and engineering sector, And the industrial sector – where a negative growth rate was recorded on average over the period from 1990 to 2003 – achieved 2.6% growth in 2004 (compared to 1.4% in 2003).

Agriculture remains a sector which considerably influences GDP growth (cf. Figure 1), the very marked variation in the growth of this sector from one year to the next being closely correlated to the variation in GDP growth.

In production terms there was no change in the rating of the main economic sectors compared to the previous year: the hydrocarbon sector remains clearly in the lead with 38% of GDP, followed by the services sector (21%) and agriculture (9%). The building and civil engineering sector accounts for 8% and the industrial sector comes last in the list with 7% of GDP – despite encouraging signs of recovery.

Gross domestic expenditure was higher in 2004 than in 2003, growing at a rate of 7.6% (compared to 5.3% in 2003); this was due to the final consumption expenditure of households, whose growth rate rose from 3.8% to 5.4%, and, to a lesser extent, to the gross fixed assets accumulation, where the growth rate was 8.1% (as against 7.8% in 2003).

The growth rate of the volume of imports rose considerably in 2004, from 2.4% to 11.6%, mainly in order to satisfy the demand for the goods and services necessary for implementing the 2001-2004 economic recovery plan, which is coming to an end. Consumption benefits more from imports than from productivity goods and intermediate goods, the items which progressed, in order of importance, being non-food consumer goods, food consumer goods, capital goods and intermediate goods. There was also a marked increase in services imports (9.2%). The export growth rate dropped sharply, on the other hand, from 7.9% to 3.8% in 2004, a decrease which is to be explained by a fall-off in the increase in foreign demand for hydrocarbons. Although performance was better in 2004 (US\$660 million

compared to 470 million in 2003), the share of the non-hydrocarbon sectors in total exports is still very low. Despite the divergence in import and export growth rates, there is still a large surplus on the current account of the balance of payments (US\$10.9 billion in 2004<sup>1</sup>) as the result of the steep rise in oil prices in the course of the year (US\$34.26 per barrel in the first six months and US\$42.98 in the last six months).

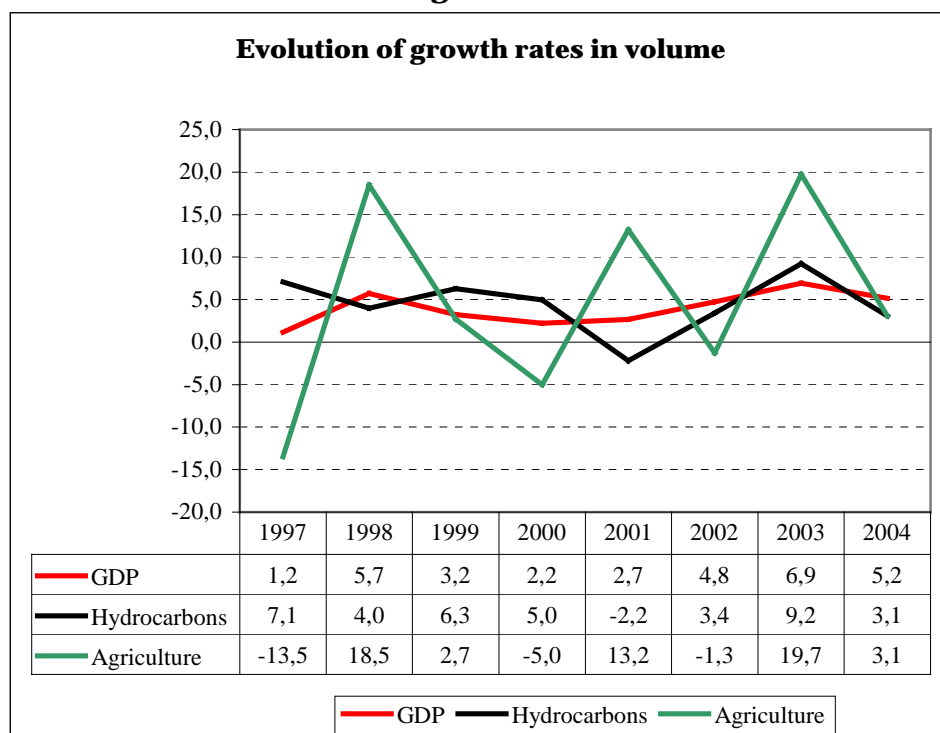
The balance of payments registered a surplus of US\$9.1 billion in 2004 despite a deficit on the capital account of US\$1.69 billion (compared to a deficit of 1.37 billion in 2003); this deficit is to be explained by the prepayments of foreign debt principal at high fixed rates and, to a lesser extent, by the foreign investments of the national oil company (SONATRACH).

The good performance in the balance of payments is reflected in the evolution of the official foreign exchange reserves, which amounted to US\$43.1 billion at the end of December 2004 (compared to US\$32.9 billion at the end of December 2003 and US\$4.4 billion at the end of December 1999). Thanks to these foreign exchange reserves, the exchange rate of the dinar against the American dollar was stabilised (DA72.61 for 1 US\$) in the period from December 2003 to December 2004). As the result of the sharp rise of the euro against the dollar the DA rate against the euro depreciated (DA91.27 for 1 euro at the end of December 2003 and DA98.95 at the end of December 2004).

In view of the sound financial situation of the country it was also possible to reduce the debt and the debt service ratio. The medium and long-term foreign debt stock dropped to US\$21.4 billion at the end of 2004 (compared to US\$23.2 billion at the end of 2003 and US\$28.1 billion at the end of 1999). The foreign debt service ratio dropped to 12.6% (excluding prepayments) in 2004 (as against 17.7% in 2003 and 47.5% in 1998). The ratio of the foreign debt to GDP dropped to 26% in 2004 (compared to 35% in 2003 and 47% in 2000). And finally, the public debt ratio (foreign debt and domestic debt) to the gross domestic product was under the 40% mark in 2004.

---

<sup>1</sup> Provisional figure (source : Bank of Algeria : <http://www.bank-of-algeria.dz/indicateur.htm>).

**Figure 11.1**

Monetary policy helped to bring monetary inflation down and to curb price inflation and contributed to economic growth. After the high inflation rate registered in the first six months, price inflation dropped to 2% at the end of 2004. It can thus be stated that monetary stability has combined with non-inflationary economic growth in the course of the past few years.

According to the official statistics, the unemployment rate was apparently no higher than 17.7% in 2004, compared to the 23.7% announced the previous year (cf. Table 11.2) – a sharp decrease which is apparently attributed to the underestimation of unemployment amongst women (Ighil Ahriz, 2005). Current employment grew by 16.7% between 2003 and 2004 as the result of the upswing in the "employers and self-employed persons" category (33.2%) and in the "family worker" category (32.1%). Growth in the number of permanent wage earners was low (2.6%), however, so the growth in employment was in fact accompanied by a certain degree of employment insecurity.

Whereas the country's outward-looking policy is being implemented and the major macroeconomic balances are being achieved reasonably successfully, this cannot be said of the privatisation of public enterprises, although the process has been

underway for some 10 years. Although 2004 seems to have brought progress in this field – 142 undertakings were apparently privatised bringing in a revenue of DA33 billion to the Treasury (approximately just over €3 million) (Cherfaoui, 2005) –, only small units were concerned, and the bulk of the public sector has still to be privatised. Other objectives are still in limbo or have merely been vaguely outlined – in particular the measures to streamline the civil service, where salaries tap a large proportion of State revenue without any significant increase in the services provided, or the efforts to fight corruption, which, although they seem to have been stepped up in 2004 and 2005<sup>2</sup>, are still limited<sup>3</sup>. Other parameters which the “country” risk rating agencies take into account place Algeria at a disadvantage: the degree of transparency of public markets, the arbitrariness of decisions, the malfunctioning of the judiciary system<sup>4</sup>, etc.

The economic outlook could be promising if more efforts were made to integrate the various sectors to a greater extent. For the public authorities' intention to resolutely promote that policy of integration is not yet clearly visible. The 2001-2004 economic recovery plan admittedly achieved several results in terms of GDP growth and job creation, but its effects would have been much more beneficial had the resources released benefited Algerian undertakings to a greater extent rather than foreign undertakings. Unless the necessary changes are made in this context it is to be feared that the second economic recovery plan for the 2005-2007 period – which makes provision for US\$55 billion of investments over the period from 2005 to 2009 – will create more jobs in other countries (through Algeria's imports) than it does in Algeria.

---

<sup>2</sup> Many high-ranking officials from various administrative departments are currently behind bars for affairs of corruption and misappropriation of public monies (Mekfouldji, 2005).

<sup>3</sup> The committee for examining corruption which was set up by the government submitted a report to the Minister of Justice at the beginning of 2005, advocating, *inter alia*, that a corruption observatory be set up and a law be passed which would repress corruption and influence peddling more resolutely (source : <http://www.quotidien-oran.com/quot3042/even.htm>).

<sup>4</sup> The « Nord Sud Export » international rating agency has classed Algeria at level B1 for the short-term country risk, i.e. in the same category as Morocco and Tunisia, whereas the OECD export credit insurance agencies have re-rated the Algerian risk, moving the country from class 4 to class 3 on a scale of 7 classes of risk (Medjahed, 2005).

## **11.2 - The context of the global economy and international trade and its implications for the Algerian economy and more specifically for the agricultural sector**

The global economy registered relatively marked expansion in 2004 (5.1% compared to 4% in 2003), although it was curbed to some extent by the rise in hydrocarbon prices towards the end of the year. The growth rate was higher than expected in the United States (4.4% in 2004 compared to 3% in 2003). It was dynamic in China (+9.5% compared to 9.3% in 2003) and relatively sustained in most emerging and developing countries (a growth rate of 7.3% in India, for example). In Europe and Japan, on the other hand, the growth rate was disappointing, although it progressed (2% in Europe in 2004 compared to 0.5% in 2003, and 2.6% in Japan as against 1.4% in 2003); this low rate was due to sluggish exports and subdued domestic demand (IMF, 2005).

This marked growth in the global economy resulted in a steep rise in hydrocarbon prices, which was to Algeria's advantage. Oil demand is reported to have increased by 3.4% in 2004 instead of the usual rates of 1% to 2% registered in previous years; it was boosted by the US (25% of oil demand) and China (8% of demand).

The effects on the national economy of the favourable trend in the world economy were limited to the benefit obtained from the rise in hydrocarbon prices, since Algeria's export capacities in other sectors are very limited. However, the increase in oil revenue did enable Algeria to import more, which it promptly proceeded to do in 2004, as has been seen above.

The effects of the global economic context and international trade on the agricultural sector can be seen in variations in the prices of imported equipment and inputs for agriculture, competition on the national market of imported agro-foodstuffs, or an increase in the export of agricultural commodities. However, there seem to have been few effects on the Algerian agricultural sector in this respect. As regards competition from imported agro-foodstuffs, customs protection measures seem to remain fairly dissuasive for importers.

## **11.3 - Evolution of agricultural aggregates in the economy**

The agricultural sector is the third economic sector in terms of formation of value added. It accounts for 9.2% of GDP – a slight decrease compared to 2003 (9.7%) – ranking third after the hydrocarbon sector (37.9%) and the services sector (21%).

The rural sector is still very important in terms of employment, accounting for almost 42% of the labour force in 2004. Its contribution to employment growth was considerable, since the working farm population increased by 16.2%, which was almost the same rate as the increase in the urban labour force (17%).

Agriculture is reported to have accounted for approximately 20.7% of total employment in 2004 (1 627 125 jobs), i.e. 14.5% more than in the previous year (1 412 340 jobs), despite a slight drop in its share of total employment (21.1% in 2003). It is still well in the lead, since the industrial sector accounts for only 13.6% of the labour force and the building and civil engineering sector accounts for only 12.4%.

As regards foreign trade, agro-food imports decreased slightly in terms of their share of total imports (25.5% of Algeria's total imports in 2004 compared to 26.3% in 2003), but they increased sharply in terms of absolute value (+30.5% expressed in US\$). On the other hand, agro-food exports dropped in relative terms from 0.6% of total exports in 2003 to 0.5% in 2004. They increased by 21%, however, in absolute value due mainly to canned fruit and vegetables (+77%) and fisheries products (+67%). There is still a marked imbalance in the agro-food balance of trade, with an import-export ratio of only 3.5%.

## **11.4 - Agricultural products**

### **11.4.1 - Crops**

It must be noted that the statistics on agricultural commodities still consist of very rough estimates calculated by the wilaya agricultural departments, which may possibly subsequently be "corrected" at the central level by the Directorate for Agricultural Statistics. Although these estimates are drawn up with the best will in the world, contradictory data are unavoidable, and the contradictions are sometimes flagrant. It is hard to see, for example, how wool output could increase by 15% from 2003 to 2004 when sheep numbers grew by only 4%. Similarly, it would seem surprising that honey output should have increased by 33% in a year that was drier than the previous year!<sup>5</sup> There are other examples of contradictory figures (an increase in sheep numbers and cattle headage and an increase in red meat output).

Yet all of the conditions for producing relatively reliable statistics are now met. The General Agricultural Census conducted in 2001-2002 constitutes a recent survey basis from which a representative sample can be drawn which could be surveyed each year. The decentralised administration of the Ministry of Agriculture and Rural Development (MADR), which is well established at wilaya, daïra and municipal level, comprises a large number of officials who could easily be given further training and could visit the farmers in the sample selected at least twice a year. The land registry departments have completed their survey of a large number of municipalities, whose agricultural areas are now known with precision in terms

---

<sup>5</sup> This increase is said to be explained by the sharp increase in the number of subsidised beehives in 2004 compared to the previous year.



of parcels. It would be desirable for the Ministry's Directorate for Statistics to carry out this work, which could provide precious performance indicators for the Ministry's policymakers.

Notwithstanding the above, agricultural production registered moderate growth in general (3.1% in volume) due to rainfall that was not altogether satisfactory, the decrease in common wheat output resulting from fungal attack (rust fungus), and the damage caused by grasshoppers in certain regions in the south of the country and on the high plateaus. As is usual in rather dry years, performance in the animal production sector was better than in the crop sector. Animal production increased by 5% and crop production by 8% (in terms of prices).

Since rainfall was less favourable in 2004 than in 2003, there was a slight decrease in the agricultural commodities grown in rain-fed areas. The growth rate for cereals output was thus negative (-6%), a decrease that is to be explained by the stagnation in barley production and the sharp drop in common wheat production (-37%). Although the average yield in 2004 was lower than the figure recorded for 2003, it was nevertheless almost twice as high as the average for the period from 1991 to 2000. Was this the effect of the subsidies granted for intensification? This question cannot be answered, since no data have been published on subsidised acreage and its development over time.

A 48% growth rate was nevertheless registered for fodder crops, where most of the acreage is rain-fed (mainly vetch-oats); this result is to be explained by a marked increase in acreage (+69%)<sup>6</sup> and yield (+29.9%)<sup>7</sup>. Here again, one notes an apparent contradiction between the marked increase in natural fodder yield (+20.6%) and the fact that 2004 was a relatively dry year compared to the previous year.

Pulse production stagnated despite a slight drop in yields; output level was maintained due to the increase in acreage (+6%). The situation in the pulse production sector remains a matter of concern, when one bears in mind that Algeria imported over 157 000 tonnes of pulses in 2004, whereas the country only produced a little over 49 000 tonnes on average in the period from 2000 to 2004. It would thus seem that the subsidies granted for these crops (for the improvement of tillage and the purchase of fertilisers and pesticides) do not provide sufficient incentive.

Horticultural production increased by 11.6% due mainly to the increase in acreage (+6.5%). Yields are still low compared to those in the northern Mediterranean

---

<sup>6</sup> There was in fact no increase in acreage : since the statistical departments realised that the acreages which had existed in previous years had not been recorded in terms of area and output, they included them in 2004, without carrying out the same modification for 2003. Hence the spectacular increase.

<sup>7</sup> The fodder yields have been « readjusted » by the Technical Institute for Major Crops, since it considers that the estimates made by the agricultural departments in previous years have been too low. So the increase in yields between 2003 and 2004 is not in fact a real increase.

countries, despite a 49% increase in 2004 compared to the average for the 1991-2000 period. Potatoes are an example of this with a bumper yield of 20.3 tonnes/ha in 2004, whereas according to FAO figures a yield of 28.4 tonnes was registered in Spain for the same year, 24.7 tonnes in Italy and 22.3 tonnes in Morocco.

The only three industrial crops where output was significant are industrial tomatoes, ground nuts and tobacco. Industrial tomato producers and processors in the north-east of the country (the main producer region) have been complaining regularly for several years of what they regard as intolerable competition from imported concentrated tomatoes. Yet despite this, the official statistics show quite considerable increases in output and yields: +35% for output and +34% for yields between 2003 and 2004. Tobacco growing is subject to fairly marked fluctuations in yield since it is a crop grown mainly in rain-fed areas. Output increased by 34% in 2004 despite the fact that there was less rain than in 2003. The 31% growth in yield in one single year is rather puzzling. Ground nuts are grown mainly in the north-east (El Tarf Wilaya) and in the southern wilayas. Although acreage grows regularly, yields are still low.

Fruit-tree crops have developed tremendously since 2000 in the context of the national agricultural development plan (PNDA), one of whose principal objectives is to convert low value-added and unpredictable crops to crops which have a higher value added and are less affected by rainfall uncertainty. The plantations that have been carried out since 2000 have now started producing, and this no doubt explains the 8% increase in output. It will be noted that yields are progressing less rapidly than output; this is to be explained by the fact that many farmers are growing fruit-tree crops for the first time.

In the citriculture field, orchards covered some 45 000 ha on average in the period from 1991 to 2000, having at last reached the acreage they covered immediately after independence. The area is now progressively expanding; it covered over 59 000 ha in 2004, i.e. 30% more than the average for the period from 1991 to 2000. Output and yield increased by 8% and 7% respectively from 2003 to 2004, but domestic demand is far from satisfied in view of consumer prices, which are still high.

The vineyard acreage was approximately 97 000 ha in 2004, still a long way from the 335 000 ha registered in 1965. As is the case with fruit-tree crops, vine production has been greatly encouraged by plantation subsidies since 2000. The average acreage increased by 43% between 1991-2000 and 2004. Output only grew by 2% between 2003 and 2004, whereas the increase recorded in yields was spectacular: almost 20%.

In the olive sector, 2004 was a prosperous year with yield per tree increasing from

11 kg to 29 kg (+170%) and an increase in oil-olive output of 294%<sup>8</sup>. Olive oil production followed the same trend, progressing by 357% between 2003 and 2004, since the oil yield had increased appreciably.

Date output decreased in the same period, on the other hand, due to lack of irrigation in certain zones and inadequate pollination. The average yield per tree also dropped (-13%).

Relatively speaking, forestry products are the best covered by statistics in view of a long-standing tradition of the forestry departments and the fact that they are required to quantify the commodities produced on the acreages that they lease out. Timber and firewood output increased by 12%, whereas cork output dropped by 3%. Esparto grass output doubled, but it is still insignificant compared to the output registered at the end of the colonial period and in the first years of independence (100 000 tonnes), which made Algeria the leading world producer of this raw material.

#### **11.4.2 - Animal products**

Animal products are even less well covered by the official statistics than crops, since the relevant departments of the Ministry do not use reliable techniques. Notwithstanding what was pointed out above with regard to the contradiction between the development of sheep numbers and rural production and between honey output and the fact that 2004 was, relatively speaking, a drier year than 2003, red meat output apparently increased by 6.5% (with 1% growth in cattle stock and 4% in the number of sheep)<sup>9</sup>, white meat (poultry farming) output increased by over 8%, eggs by 6%, milk by 19% (but then artificial fodder output apparently increased by 96%!), honey by 36%...

The effects of subsidisation policy on animal production do not seem to have been particularly pronounced, especially as far as cow's milk output is concerned. In Constantine Wilaya, for example, it is reported that collected cow's milk output increased by 63% between 2001 and 2004, but then milk collection only concerned 18% of total output. What is more, productivity is still low (3 237 litres/year on average, 14 000 cows classed as "modern dairy cattle"), and the hygiene conditions in byres are still inadequate (Boussaïd, 2005).

---

<sup>8</sup> Olive production in Algeria naturally fluctuates widely from one year to another.

<sup>9</sup> One might suppose that the weight of animals at slaughter increased, but in a less favourable year (as is the case here) animals tend to weigh less.

### 11.5 - The agro-food industries

The Ministry of Small and Medium-Sized Enterprises and Craft Industry (MPMEA) states in its Bulletin no. 6 that there were 226 227 SMEs in 2004 – taking all sectors into account; 99.7% of these businesses were privately owned and 0.3% state-owned<sup>10</sup>; SMEs accounted for 89.2% of jobs, and public enterprises 10.8% (MPMEA, 2005). The AFI sector accounts for 6.1% of this total.

The AFI sector is now largely dominated by the private sector, which accounted for approximately 75% of sectoral value added in 2003 (compared with 71% in 2002). With regard to the number of firms, 13 673 undertakings were registered in the private AFI sector in 2004 so that the sector ranked amongst the seven largest (among the 22 sectors classed by the authors of the study on SMEs) with 6% of the small and medium-sized enterprises registered in the country, coming fifth after the building and civil engineering sector (32%), the wholesale and retail trades and the distribution sector (17%), transport and communications (9%), services provided for households (7.5%) and the hotel and catering trade (6.3%).

In terms of growth, the AFI sector seems to be tailing off: the number of businesses in the sector only increased by 4.7% in 2004, ranking last in the seven major sectors and even below the average of the other sectors (6%).

2004 was marked by the saturation of the grain-mill and semolina product market, which was the result of the overinvestment that has been typical of the sector for the last 10 years. Whereas the bigger milling plants and semolina factories try to find export markets, some of the smaller ones have had to close down.

The privatisation of public agro-food enterprises is now at last beginning to take on concrete form. All of the enterprises in the sector – there are 164 – have been declared privatisable<sup>11</sup>. Several subsidiaries of ERIAD Algiers have been sold to private investors; ERIAD Setif – the first state enterprise to be listed on the stock exchange (in 1999) because of its high performance – was put up for sale in its entirety in 2005 having accumulated considerable deficits in the course of the last three financial years (Benlaïche, 2005). An invitation to tender has also been launched for the privatisation of ERIAD Tiaret as well as enterprises manufacturing beverages and cold storage enterprises (cf. site of the Ministry for Participation and Investment Promotion – MPPI – for the list of enterprises for sale).

Some of the enterprises in the AFI sector receive State aid in the context of an upgrading scheme, which consists of a strategy for accompanying both public and private industrial enterprises with a view to helping the latter to cope with the new

<sup>10</sup> State-owned SMEs, of which there were 778 in 2004, accounted for 60% of public enterprises (approx. 1 300 in 2004).

<sup>11</sup> Cf. web site of the Ministry for Privatisation and Promotion of Industry ([www.mdppi.dz](http://www.mdppi.dz)).

constraints resulting from the opening of markets and the integration of the Algerian economy into the free trade areas established with the EU and, shortly, with States which have joined the WTO. The aim is to promote industrial competitiveness by improving the performance of undertakings through upgrading measures and measures to improve their environment. The upgrading measures concern:

- the modernisation of plant;
- the improvement of organisation, management and production systems;
- productivity gains resulting in control of production costs;
- the development:
  - of training and further training;
  - of quality and certification;
  - of marketing and market research; and
  - of alliances and partnerships.

The upgrading schemes are financed by the EU (Euro-development Programme for SMEs) in the MEDA context, by the French Development Agency and Algeria (Ministry of Industry and Restructuring with UNIDO support). These programmes are encountering difficulties which are relatively difficult to resolve. According to an evaluation by the Ministry of SMEs, "at microeconomic level entrepreneurs are reluctant to concern themselves with the future and with anticipated market developments; they distrust one another and often work alone without any skilled human resources other than their close relatives. They give priority to technology and production and the modernisation of equipment and plant, and they attach much less importance to the aspects of organisation, strategy, human resources management and financial management". However, the main difficulty in upgrading undertakings seems to lie in the difficulty in upgrading the business environment (administrative departments, banks and other credit organisations).

## **11.6 - Foreign trade and the self-supply rate**

Expressed in US dollars, Algerian foreign trade increased considerably in the period under review (+43% between 2003 and 2004), but agricultural foreign trade only increased by 30%. If imports are considered on their own, agro-food imports also grew less rapidly than total imports (30.5% and 34.7% respectively).

### **11.6.1 - Imports**

Algeria's financial ease allowed the country to considerably increased food imports, which rose by 28%, and to increase non-food agricultural imports by 36.7%; the latter concern raw materials (wood) and agricultural inputs (seed, animal feed). The increase in the value of imports was accompanied by an increase in import

volume in the case of the major foodstuffs: this increase was slight in the case of cereals (+0.4%), and larger in the case of milk (19%), oils (11.4%) and sugar (13.9%). In view of the increases in agricultural commodities mentioned above, it would thus seem that the Algerian population was better supplied with foodstuffs than had been the case the previous year.

The international market was not very favourable for Algeria; the prices of the main foodstuffs imported rose appreciably. Whereas the volume of cereal imports only increased by 0.4%, their value increased by almost 21%. The price increases were as follows: durum wheat rose by 7.3%, common wheat by almost 43%, maize by 21.5%, powdered milk by 37%, sunflower oil by 12%, and soybean meal by 33%.

In terms of major economic regions, there was practically no change in the flux of imports in 2004 compared to 2003. The OECD countries continued to supply 50% of imports in terms of value (57% in 2003), and the EU-15 41% (42% in 2003). The NAFTA countries increased their share from 17% in 2003 to 23% in 2004. The share of the CIS and the countries of the Arab League dropped from 7% to 5% and from 4% to 2% respectively.

Broken down by country, France remained the main supplier in 2004 accounting for 18% of the value of Algerian imports (19.3% in 2003), followed by Argentina with 12.2% (5.9% in 2003) and the US with 8% (7.4% in 2003). France is the main supplier of durum wheat (35.5%) and common wheat (43.8%), and the US and Argentina monopolised maize imports accounting for 62% and 37% of their value respectively. Imports are more diversified in the case of powdered milk and AMF<sup>12</sup>: Argentina is in the lead with approximately 17%, followed by France with 16%, Belgium with almost 11%, New Zealand with 10% and Poland with 8%. As regards oil imports, France and Germany come first with 78% and 22% of the quantities imported; Russia and Argentina account for 58% and 20% of the rapeseed oil imported, and Argentina and the US account for 20% and 11% of sunflower oil imports. In the case of raw sugar imports, Brazil is well ahead in terms of quantity with 69%, followed by France with 17%.

### **11.6.2 - Exports**

Agricultural commodity exports continue to account for only a tiny share of total exports (0.6% in 2003 and 0.5% in 2004), even though they grew by 21% in 2004. Likewise, the import-export ratio is still pathetically low (3.8% in 2003 and 3.5% in 2004). If only foodstuffs are taken into account (and non-food agricultural commodities are thus excluded from the calculation), the import-export ratio is even lower (around 2% for the last two years).

The bulk of exported foodstuffs (worth approximately US\$68 million) is composed of dates (28% of the value of foodstuff exports), fisheries products (16%) and wine

---

<sup>12</sup> Anhydrous milk fat.

(10%). Although the quantities exported are still small, the exports of all of these products increased considerably in 2004: dates by 14.5%, fisheries products by 67% and wine by 18%.

Export flows changed little in 2004 compared to 2003. The main destinations were France (30% in 2004 compared to 27% in 2003), Spain (18.3% in 2004, which was a slight decrease compared to 21% in 2003) and Italy (10.2% in 2004 as against 10.7% in 2003).

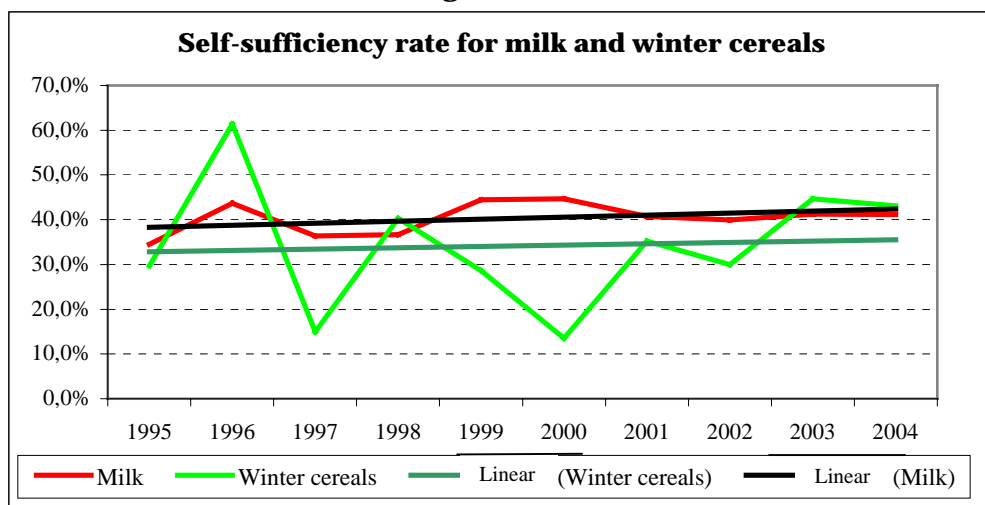
The import-export ratio is still very low even in the case of the countries to which Algeria exports most: 6.4% in the case of France, 9.4% in the case of Spain and 14% in the case of Italy. The import-export ratio was only 7.5% for the EU-25 as a whole.

Exports have been receiving a number of support measures for about 10 years (in particular in the handling and land and maritime transport fields), but the Fund which has to finance this support has never been provisioned consistently. The Finance Act 2005 has just remedied this by making provision for the allocation of 2% of domestic consumer tax to the Special Export Promotion Funds. This will provide DA660 million to boost the Fund's activities.

### ***11.6.3 - The self-supply rate***

The self-supply rate for the major agricultural commodities deteriorated slightly in 2004 compared to 2003. This was the case with durum wheat, common wheat, chickpeas, concentrated tomatoes, garlic, and red meat. However, in relative terms, performance in 2004 was better than that registered for the average of the 1995-2004 period.

The evolution of the self-supply rates for the major foodstuffs shows that the policies that have been pursued in the course of the last 10 years have been unable to significantly reduce the country's dependence on a sustainable basis. The trend lines for the principle commodities are still hopelessly flat (cf. figure below for cereals and milk).

**Figure 11.2**

## 11.7 - The fisheries sector

### 11.7.1 - Infrastructure, plant and equipment, employment and organisation

The number of fishing boats increased slightly in 2004 compared to 2003 – by 3% (108 new units purchased) – although the increase registered the previous year had been much greater: + 14% (412 units). This considerable drop in the number of purchases can be explained by the diminishing number of individuals and firms that are in a position to fulfil the conditions (particularly the financial conditions and guarantees required by banks) in order to be eligible for State subsidisation for the purchase of boats and ships. If the current purchasing rate remains constant it is unlikely that the national plan for developing fisheries and aquaculture in the 2003-2007 period will be accomplished as scheduled. For although the transaction rates are satisfactory in the case of trawlers and sardine boats (purchase of 106 of the 181 trawlers planned and purchase of 100 of the 337 sardine boats planned), this is not the case with small fishing boats (only 4% of the 1 294 purchases planned) and tuna boats (4 purchased out of the 32 purchases planned).

The majority of the ships which were purchased and granted State subsidies were low-powered boats (40 sardine boats and 39 small fishing boats). Only 2 tuna boats and 27 trawlers were actually purchased in the course of 2004. It is to be noted that the fisheries sector is a good client for Algerian shipbuilders, at least in the case of sardine boats and small fishing boats, since 32 of the 40 sardine boats purchased in



2004 were built by Algerian firms and 38 of the 39 small fishing boats were built in Algeria. The tuna boats and trawlers still come from abroad (only one trawler was produced locally). The shipbuilders are mainly Mediterranean (Spanish firms built 16 trawlers, 2 tuna boats, 3 sardine boats and 1 small fishing boat, Turkish firms built 6 trawlers and 4 sardine boats, and Tunisian firms built 3 trawlers).

Fishing infrastructures other than boats are also State-subsidised. In 2004, 18 sets of fishing tackle and equipment for small fishing boats were received, the engines of 8 small fishing boats were renewed, 1 sardine boat was restored, and shipbuilding plant was supplied to ECOREP (State-owned shipbuilding enterprise).

As regards aquaculture infrastructures, 2 shellfish farms were established in 2004, one in Algiers Wilaya and the other in Tipaza Wilaya, (each with 50 tonnes of mussels and oysters), 2 rural fish farms were set up (producing 5 tonnes of freshwater fish in Setif Wilaya), and a freshwater fisheries project was launched in Guelma Wilaya.

The downstream industries in the sector received the following subsidies in 2004: 5 cold chambers, 3 ice factories, 1 analytical laboratory, equipment for a sales point and 5 refrigerated transport vehicles.

Employment in the fisheries sector increased by 10% in 2004 according to the statistics of the Ministry concerned. The available labour force in this field still lacks training, particularly in modern fishing methods.

And finally, as regards organisation, the Finance Act 2005 makes provision for allocating 10% of the product of the license fees paid by foreign-registered ships to obtain a commercial permit to fish the major migrating fish species in Algerian waters to a fund for supporting the activities of the National Chamber of Fisheries and Aquaculture.

### ***11.7.2 - Production, consumption and trade in fisheries products***

The figures collected on production must be viewed with caution (due to the shortcomings of collection methods and means), and care must thus be taken in interpreting the data provided by the Ministry. Having said this, fisheries product output is reported to have dropped slightly in 2004 compared to 2003 (-3%), a decrease which is probably due to unfavourable weather conditions for fishing expeditions during the major part of the year.

Per capita consumption of fisheries products decreased slightly in 2004 due to the downswing in production, the low increase in imports and population growth.

Imports (essentially frozen products) have been increasing sharply in quantity since 2002 - by more than 200% between 2002 and 2003 and continuing to increase in 2004, although the rate was low. Unit import prices also rose sharply in

2004: +50% in the case of tuna, +30% in the case of hake, and +27% in the case of other frozen fish.

The import-export ratio in terms of value was only 44%. Exports consisted mainly of shrimps (74% of export the value) and snails other than sea snails (14%). Spain was the main export destination (81% of the value of exports) due to its geographic proximity.

### ***11.7.3 - The main lines of policy in the fisheries sector***

The objectives of the strategy for developing the fisheries sector as defined by the Ministry of Fisheries and Fisheries Resources (MPRH, 2004) are as follows:

- "to increase production,
- to contribute to food security (with emphasis on the distribution of fisheries products throughout the country),
- to create jobs,
- to promote rural development and regional balance by developing coastal enclaves and stabilising their populations,
- to safeguard biological resources through responsible, rational, economical, professional, ecological and sustainable fishing,
- to promote national and foreign investments, and
- to encourage exports, particularly of high-value-added species".

It will be noted that the objectives of this strategy do not explicitly comprise the need to integrate the fisheries sector into the national economy, although that is a highly desirable objective for a developing country. The financial resources which the State is investing in the development of the sector are liable to provide more jobs for foreign firms than for national firms unless the State implements sufficiently consistent incentives for the latter.

In the context of this strategy the MPRH has, since its inception, been endeavouring to encourage fisheries professionals to practise "responsible fishing". To do so, it commissioned the drafting of a new marine chart of the Algerian coast in 2003-2004 with the collaboration of the Spanish authorities; this chart shows the main possible fishing grounds with forecasts of the yields which could be obtained there. It also provides information on the relief of the continental shelf and bathymetry. The chart has been popularised since 2004-2005 by means of talks and conferences given by Ministry officials in the various coastal wilayas (Mejdoub, 2005).

## **11.8 - Evolution of agricultural and rural development policies**

### ***11.8.1 - Structural policies***

In the structural policy field 2004 was rather a non-event. What had been expected was at least a law on the status and form of management of agricultural land, which is currently governed by Act no. 87-19, which instituted collective farms (EAC) and individual farms (EAI). The land involved was to be placed under the leasehold system to enable private investors to join in the capital subscription with the consent of the persons currently farming the land (cf. 2004 and 2005 CIHEAM report).

### ***11.8.2 - Rural development policies***

Rural development policies focus mainly on developing employment in rural areas and improving living conditions.

The action carried out in this field generally concerned monitoring the implementation of pilot Decentralised Rural Development Projects (PPDR) (Minister of State for Rural Development, 2005). Of the 1 227 projects which have been launched, and which target 88 000 households, 435 have been completed; they include:

- 194 decentralised rural development projects (PPDR) in 25 wilayas;
- 241 decentralised projects for combating desertification (PPLCD) in 20 wilayas.

With regard to employment, one of the principal policies aims to expand irrigated areas, which provide many more jobs per hectare than do rain-fed areas. The total irrigated area increased by almost 10% in 2004 from 722 300 ha in 2003 to 793 300 ha in 2004 (+71 000 ha!) – an exceptional rate of increase, which had never been achieved since independence. It is reported that the irrigated area had increased by almost 127% (+443 300 ha) since just before the National Agricultural Development Plan was launched in 2000, growing from 350 000 ha in 1999 to 793 337 ha in 2004.

A specific rural development policy is implemented by the "programme for developing land through leasehold", which is financed by the National Fund for Developing Land by Leasehold (FNMVTC). Under this programme, the State develops areas of agricultural land which is lying fallow or which is not farmed to any great extent or is badly farmed – generally belonging to the public domain but not exclusively – and to lease them to farmers who have no or not enough land. The development schemes consist mainly of sinking tube wells and providing irrigation equipment, measures to improve land, the planting of fruit trees, electrification measures, the planting of windbreaks, the construction of approach tracks to the

new farmers, and so on. In pastoral zones the development measures often consist of planting fodder shrubs and deferring grazing on rangelands. Over 324 000 ha of land are reported to have been developed under this programme since 1999 and distributed to some 24 000 leaseholders. The developed land is mainly in steppe zones (60%) and mountainous zones (37%); 3% of the developed land is in the Sahara. The farms that have been created are relatively large, particularly those which are irrigated – with an average acreage of 11 ha, a fact which is rather paradoxical for land intended mainly for poor populations. In the south of the country (the Sahara), the area allocated to each leasehold is much smaller (2.6 ha), which means that it has been possible to give land to a larger number of landless peasants.

Apart from the above programme, one of the main policies targeting poor rural areas led to the signing of a 95 million US dollar loan with the World Bank at the end of 2003 for running what is called a "rural employment" project. This project is the continuation of a similar project which was coming to an end and had covered mountainous regions in the seven wilayas in the west of the country (Tlemcen, Sidi Bel Abbès, Aïn Temouchent, Mascara, Mostaganem, Relizane and Oran) and had received a loan of US\$ 89 million. Both projects aim to create employment and improve the incomes of mountain farmers while at the same time fighting erosion and developing the watersheds of the major dams. The second project, the "rural employment" project, was not launched until the end of 2004 (more than a year after the signing of the loan agreement) due to the lengthy procedures imposed both by the Bank and by the Algerian regulations.

In addition to these measures, several others promoted rural employment in 2004, although they did not specifically target the rural sector.

Analysis of the steppe zones has shown that unemployment and underemployment are the major factors explaining rangeland degradation. In order to stimulate job creation in these zones, the High Plateaus – where the greater part of the grassland ranges threatened with desertification are located – now benefit from a special economic development fund as the result of the Finance Act 2004. This fund, which is provisioned with an allocation from the State budget of 3% of oil taxes and is under the authority of the Ministry of Finance, will finance all or part of the infrastructural development schemes and projects and will support "productive" investments in the region.

Again in order to promote job creation, the Finance Act 2004 provides that small and medium-sized enterprises which are established and produce in the wilayas in the south of the country and on the High Plateaus and which are eligible for support from the special fund for developing the wilayas in the "Deep South" and from the special fund for the economic development of the High Plateaus will be granted a 15% and 20% reduction of the company profit tax due on the production of goods and services in the case of activities carried out in the wilayas of the High

Plateaus and of the “Deep South” respectively. The same Finance Act grants exemption from registration fees for deeds on transactions concerning agricultural land or land of agricultural value and deeds of transfer between joint owners concerning the same categories of land. These two cases of exoneration aim to promote reparcelling and the constitution of sole proprietorship instead of joint ownership which is an obstacle to investment in agriculture.

As regards the rural housing sector, the Finance Act 2004 (Section 50) also endeavours to promote rural housing by exonerating the profits made on activities promoting such housing from tax on total income and company profit tax.

And finally, at the organisational level, rural development has now had a strategy since 2004 – which has not yet been officially adopted by the government but which is widely publicised and explained to all of the parties involved – and a whole range of guidelines and implementation procedures. The national strategy for sustainable rural development is the first document in the post-socialist Algeria which proposes an overall and coherent vision of the rural world in its relationship with agriculture and – to a greater or lesser extent – with the agro-support and downstream industries. A shortcoming of this document, however, is that it fails to take account of the other activities necessary to rural development, in particular industrial activities. For agriculture and the agro-support and downstream activities cannot alone suffice to produce a sustainable form of rural development which complements and is in harmony with overall development.

However, in addition to setting targets in precise figures, the document deserves credit for being based on relatively comprehensive studies of poorer rural areas and an analysis of past experience – even if these studies have in some cases being conducted rather hastily and lack full documentation. The strategy actually aims first and foremost to improve the living and working conditions of population segments which until now have been more or less excluded from the development process in the country. These population groups are located – but not exclusively – in the mountainous regions in the north of the country, in the steppe zones and in certain regions in the south. On the basis of an exhaustive census of the poorest municipalities, the strategy proposes that 10 500 decentralised rural development projects be run in the 10-year period from 2005 to 2015 concerning small isolated human settlements; 2 500 of these projects would aim to “revive economic and social activities in the Ksours and in rural towns and villages”, 2 150 would focus on combating desertification (mainly in the steppe zones), and 1 000 would aim to create farms on marginal but developed State lands which would be leased to the rural poor. Furthermore, an unspecified number of decentralised projects are planned for developing and managing approximately 1 million ha of dam watersheds in the period from 2005 to 2015. As for agricultural development per se, the strategy makes provision for running 350 000 projects in the same number of farms covering approximately 3.6 million ha (of the 8.3 million forming the AAU of the country). With these projects, the areas irrigated by water-saving techniques

could be expanded from 120 000 to 400 000 ha, strategic crops could be intensified on 500 000 ha per annum, fruit plantations could be increased by 50 000 ha per annum, export crops (early fruit and vegetables and organic products) could be increased, and the number of high-potential dairy cows could be increased by a headage of 150 000 ...In the employment field, the plan is to create 1.8 million jobs in the period from 2005 to 2015, 40% of which would be obtained through projects for upgrading farms and projects for promoting young investors and developing subsectors, 40% through decentralised rural development projects and projects for developing land through leasehold, and 20% through projects aiming to protect natural resources (PPLCD and PPABV). These results are to be obtained through a State budget effort which does not seem out of proportion: according to our calculations, the annual expenditure for the period involved would only amount to 1.6 times the annual expenditure actually recorded in the course of the 2000-2004 period. This is a considerable effort but one that is quite feasible. It is at all events essential if the nation is to help the poorest rural areas out of their current virtual exclusion.

### ***11.8.3 - Investment, price and subsidisation policies***

Investments in agriculture (excluding investments in irrigated areas) dropped by 14.1% in 2004 compared to 2003; this decrease affected mainly the subsidisation of farmer investments financed through the National Fund for Agricultural Development (FNRDA). The expenditure of the Fund for Rural Development and the Development of Land through Leasehold (FDRMVTC) – which finances the development of land for creating new farms – also decreased considerably. These decreases in the expenditure of the FNRDA and the FDRMVTC are no doubt to be explained by the public authorities' intention to be more stringent in the selection and preparation of the projects to be subsidised. For many projects were apparently financed in the 2000-2003 period without adequate prior assessment, and this led to quite considerable wastage of resources (unsuccessful drilling, delays in development work due to project re-assessment, the lack of firms for implementing the projects or the low level of skills of firms, the difficulty in obtaining cooperation on the part of the future beneficiaries of the developed land, etc.).

With regard to prices, policy in this field has no longer played a role in agricultural policies for quite some time, except as far as price support for the production of (durum and common) wheat and cow's milk is concerned. The farm gate prices for wheat – reference prices fixed by the State for the quantities delivered to the Algerian Interprofessional Agency for Cereals (OAIC) – have not changed since 1995. The subsidy is constituted by the difference between the average import price registered by the OAIC and the reference prices fixed by decree.

In the subsidisation field, the State has been giving precedence since 1995 to subsidies for purchasing farm equipment, particularly for dairy farming, irrigation and fruit-tree plantations as well as subsidies for the intensification of certain crops

(wheat, potatoes, forage for dairy cattle). With the implementation of the National Agricultural Development Plan the subsidies have concerned a larger number of fields and measures since 2000; they are financed by two main Funds: the FNRDAR and the FDRMVTCT. Farm income support subsidies amount to very little compared to investment subsidies (3.5% in 2004), although they can increase sharply in the event of a good harvest at the national level and a simultaneous drop in prices on the world market. These subsidies decreased in 2004 compared to 2003 due to harvest fluctuation (compared to the previous year) and the high price of imported durum wheat.

At the end of 2004 the government decided to change the subsidisation rates for certain equipment and certain measures either by simply doing away with the subsidy altogether or by reducing the rates practised hitherto. According to the policymakers, this modification of subsidisation policy is justified on the one hand by the fact that the State lacks resources and on the other hand by the fact that saturation point has been reached in the case of certain equipment such as cold storage capacities. These arguments are far from valid, however, for Algeria has never been so well-off financially as it is at the present time (cf. the foreign exchange reserves described above). Furthermore, although some reductions are justified by the fact that the former rates were frankly exaggerated<sup>13</sup>, many of the cases where a subsidy has been reduced or done away with run counter to the important objectives of agricultural policy. This is true, for example, in the case of subsidies concerning drilling, wells, irrigation plant – particularly spray and linear move sprinkler systems –, tillage for cereals, pulses and fodder, olive production, wine growing, phoenix date palm growing, dairy equipment for farmers, the construction of dairies, poultry farming, bee-keeping, and plant for processing agricultural commodities (conditioning, cold storage, etc.). Yet cold storage capacities – of which there is reportedly a surplus – are sorely lacking in certain regions. The subsidy restrictions are even less understandable when one considers that the country devotes only a tiny share of its public finance to subsidisation compared to what developed countries devote to their agricultural sectors: according to our calculations, total expenditure on agriculture in 2004<sup>14</sup> amounted to only 9.1% of the GAP (which, moreover, is highly underestimated by the national accountants) and less than 1% of GDP (0.84%)!

And finally, it is to be noted in the field of indirect subsidies that the Finance Act 2005 now grants VAT exemption for all transactions concerning camelids with a view to reducing the cost of raising these animals, which constitute a major part of animal husbandry in the Sahara zones.

<sup>13</sup> A standard reservoir was subsidised at DA250 000, for example, whereas it was a well-known fact that it did not cost more than DA100 000; the difference was pocketed by the entrepreneur, the farmer receiving the subsidy and the public official in charge of monitoring the installation work and signing to certify that the firm had duly provided the service.

<sup>14</sup> Public amenities budget + support Funds (FNRDA, FNMVTC, FPPDLS, etc.) + the irrigation infrastructure expenditure of the Irrigation and Drainage Agency (which is under the authority of the Ministry of Water Resources).

#### **11.8.4 - The 2005-2009 5-year plan**

The government's ambitious second economic recovery plan has a budget of DA4 202.7 billion (approximately US\$50 billion) for the 5-year period from 2005 to 2009. This plan devotes some 300 billion dinars (7.1% of the total amount) to supporting agriculture and rural development. However, since this sum amounts to 89% of the support for economic development in the various sectors, agriculture can be considered to be relatively "favoured" compared to the other economic sectors. The agricultural sector and rural development also receive a certain amount from other programmes such as the housing scheme, to which 555 billion to be allocated (13.2% of the resources of the 5-year plan), municipal development programmes, programmes concerning national education, vocational training, vocational training, public health, water supply, electrification, etc.

With regard to the fisheries sector, approximately DA12 billion are to be devoted to supporting corporate investment and expenditure on plant for the administration of fisheries and fisheries resources, excluding the port infrastructures covered in the programmes of the transport and public works sectors.

#### **11.9 - Agriculture, natural resources and the environment**

The efforts to fight desertification are carried out mainly on the grassland ranges most threatened by the phenomenon. The methods employed – by the High Commission for Steppe Development and the departments of the Directorate General for Forestland – are classical: deferral of grazing, tree and fodder shrub plantations.

The Directorate General for Forestland (DGF) is the principal institution involved in combating desertification<sup>15</sup>. Its 2003-2004 balance sheet shows a decrease in planted acreage (-14%), affecting fruit plantations in particular (-36%). The drop in the fruit-tree plantation rate since 2001 has been accompanied by an increase in the forest plantation rate. Does this mean that the policy launched in 2001, which consisted – for the forestry departments – in systematically promoting fruit trees at the expense of forest trees, is being called in question? If this is the case, it would be a great pity for the rural populations which benefit from these fruit tree plantations and which rightly consider that forest tree plantations do not help them to make a better living as rapidly and consistently as do fruit tree plantations. For riparian populations have many times expressed their surprise to see the State spend so many resources on Aleppo pine or stone pine plantations, whereas Algeria is still

---

<sup>15</sup> Together with the High Commission for Steppe Development it absorbs the bulk of the public amenities budget of the Ministry of Agriculture and Rural Development. Furthermore, the DG for Forestry is the focal point of the national programme for combating desertification, which was set up in the context of the Convention to Combat Desertification.



far from self-sufficient in the produce of rain-fed tree farming (almond trees, pistachio trees, olive trees, walnut trees, pecan trees, etc.).

It makes sense to make maintenance the main line of policy in the forestry sector; it should take precedence over the creation of new forest tree plantations. For if Algeria could maintain its current forest area in good condition this would already be an excellent result from the point of view of medium and long-term forestry policy. But the number of projects in this field dropped in 2004 compared to 2003: by 30% in the case of forestry work, by 51% in the case of work to clear new tracks, by 33% in the case of the development of forest tracks, and by 76% in the case of the rehabilitation of benches. Forest plantations, on the other hand, have increased by 18%.

With regard to water policy, Algeria has planned to establish 10 seawater desalting plants by 2009 with a view to putting an end to the shortage of drinking water in the country; these plants will be able to produce almost 2 million cubic metres per day. The American firm of GE Ionics has signed a building-operating-transfer contract and is currently building a plant with a capacity of 200 000 m<sup>3</sup>/day for the city of Algiers; it will hold 70% of the capital invested in this plant<sup>16</sup>.

In the environment policy field, agriculture is concerned in a measure that has been taken to eradicate the plastic bags which are used – inter alia – for packaging agricultural products sold mainly in the retail trade. The Finance Act 2004 has actually introduced a tax of DA10,5/kg on this product, whether it is imported or produced locally; the tax is paid into the National Fund for the Environment and Depollution. Furthermore, the black plastic bags which disfigure the countryside when dispersed by the wind have been banned from use by regulations laid down in 2005.

---

<sup>16</sup> *Oran Daily* newspaper of 26-6-2005.

## Appended tables

**Table 11.1 - Algeria - evolution of the major aggregates  
(value in billion DA)**

	2002			2003			2004		
		Growth rate			Growth rate			Growth rate	
	Value	Vol.	Price	Value	Vol.	Price	Value	Vol.	Price
<b>GDP</b>	4537.9	4.8	1.7	5264.2	6.9	8.5	6112.6	5.2	10.4
G&S imports	1159.1	19.5	4.2	1250.7	2.4	5.4	1549.8	11.6	11.1
● Goods	1001.0	21.4	4.2	1093.9	3.7	5.4	1366.5	11.9	11.6
● Services	158.1	9.1	4.2	156.8	-5.9	5.4	183.3	9.2	7.1
G&S exports	1605.8	5.4	-1.8	2019.8	7.9	16.6	2468.1	3.8	17.7
● Hydrocarbons	1444.2	3.4	-2.6	1856.4	9.2	17.7	2272.8	3.1	18.7
● Other	58.3	30.3	6.5	54.5	-11.3	5.4	60.3	4.4	6.0
● Services	103.3	29.4	5.2	108.9	0.0	5.4	135.0	15.2	7.6
<b>Gross domestic expenditure</b>	4091.2	8.2	3.8	4495.1	5.3	4.4	5194.3	7.6	7.4
Final consumption	2688.5	4.2	4.3	2902.7	4.0	3.8	3235.8	5.4	5.7
● Households	1988.1	3.8	3.7	2125.0	4.0	2.8	2350.7	5.8	4.5
● Public admin.	700.4	5.5	6.3	777.5	4.2	6.5	885.6	4.5	9.0
Accumulation	1402.7			1506.2			1958.7		
● GFAA	1111.3	7.6	7.0	1265.2	5.7	7.7	1458.0	8.1	6.6
● Var. stock	291.4			327.4			500.7		
<b>Sectoral VA</b>									
● Agriculture	417.2	-1.3	2.6	510.0	19.7	2.1	561.0	3.1	6.7
● Hydrocarbons	1477.0	3.7	-1.4	1873.2	8.8	16.6	2319.1	3.3	19.8
● Industry	325.8	2.9	1.3	344.9	1.4	4.3	369.8	2.6	4.5
● Building and civil engineering	409.9	8.2	5.6	446.6	5.5	3.3	506.4	8.0	5.0
● Services	1031.0	5.3	2.2	1133.2	4.2	5.5	1282.1	7.7	5.1
● CD & VAT	377.5	16.7	6.8	403.1	2.3	4.4	439.3	10.2	-1.1
GDP excl. hydrocarbons	2561.4	5.7	3.3	2709.9	6.2	3.1	3158.7	11.7	4.4
GDP excl. hyd. & excl. agr.	2144.2	7.2	3.5	2213.6	4.0	3.4	2597.7	13.0	3.9
Services of public administrations	499.5	3.0	2.6	553.2	4.5	6.0	634.8	4.0	10.3
GDP	4537.9	4.8	1.7	5264.2	6.9	8.5	6112.6	5.2	10.4
GDP excl. hyd.	3060.9	5.3	3.2	3391.0	6.0	4.5	3793.5	6.2	5.3
GDP excl. hyd. & excl. agr.	2643.7	6.4	3.3	2881.0	3.8	5.0	3232.4	6.8	5.1
GDP excl. agr.	4120.7	5.4	1.6	4754.2	5.6	9.2	5551.5	5.4	10.8

Source : Ministry of State for the Plan.

**Table 11.2 – Employed population and unemployment**

	Urban	Rural	Total	Urban %	Rural %	Total
Current employment	4 548 045	3 250 367	7 798 412	58.3	41.7	100.0
- <i>Employers- self-employed</i>	1 428 099	1 043 706	2 471 805	57.8	42.2	100.0
- <i>Permanent employees</i>	1 975 505	926 860	2 902 365	68.1	31.9	100.0
- <i>Non-perm. employees + apprentices + other</i>	918 474	866 167	1 784 641	51.5	48.5	100.0
- <i>Family workers</i>	225 967	413 634	639 601	35.3	64.7	100.0
Unemployed population	994 371	677 163	1 671 534	59.5	40.5	100.0
Current working population	5 542 416	3 927 530	9 469 946	58.5	41.5	100.0
Unemployment rate in %	17.9	17.2	17.7			

**Table 11.3 – Distribution of employment according to the sector of activity of the establishment and stratum (September 2004)**

	September 2003		
	Urban	Rural	Total
Current employment	3 886 288	2 797 768	6 684 056
- Employers - Self-employed	1 021 955	833 406	1 855 361
- Permanent employees	1 932 588	896 609	2 829 197
- Seasonal workers + apprentices + others	772 067	743 375	1 515 442
- Family workers	159 678	324 378	484 056
Unemployed population	1 223 119	855 151	2 078 270
Current working population	5 109 407	3 652 918	8 762 325
Unemployment rate %	23.9	23.4	23.7

	September 2004					
	Urban	Rural	Total	Urb.	Rur.	Total
Current employment	4 548 045	3 250 367	7 798 412	58.3	41.7	100.0
- Employers- Self-employed	1 428 099	1 043 706	2 471 805	57.8	42.2	100.0
- Permanent employees	1 975 505	926 860	2 902 365	68.1	31.9	100.0
- Seasonal workers + apprentices + others	918 474	866 167	1 784 641	51.5	48.5	100.0
- Family workers	225 967	413 634	639 601	35.3	64.7	100.0
Unemployed population	994 371	677 163	1 671 534	59.5	40.5	100.0
Current working population	5 542 416	3 927 530	9 469 946	58.5	41.5	100.0
Unemployment rate %	17.9	17.2	17.7			

	Variation 2003/2004 in %		
	Urban	Rural	Total
Current employment	17.0	16.2	16.7
- Employers- self-employed	39.7	25.2	33.2
- Permanent employees	2.2	3.4	2.6
- Seasonal workers + apprentices + others	19.0	16.5	17.8
- Family workers	41.5	27.5	32.1
Unemployed population	-18.7	-20.8	-19.6
Current working population	8.5	7.5	8.1
Unemployment rate %			

Source: National Statistical Office.

**Table 11.4 - Employment by sector**

	<b>September 2003</b>		
	<b>Urban</b>	<b>Rural</b>	<b>Total</b>
Agriculture	307 150	1 105 191	1 412 341
Industry	593 615	210 538	804 153
Building and civil engineering	410 139	389 775	799 914
Wholesale + retail trade and services	2 575 385	1 092 265	3 667 650
<b>Total</b>	<b>3 886 289</b>	<b>2 797 769</b>	<b>6 684 058</b>

	<b>September 2004</b>					
	<b>Urban</b>	<b>Rural</b>	<b>Total</b>	<b>Urban</b>	<b>Rural</b>	<b>Total</b>
Agriculture	364 466	1 252 659	1 617 125	22.5	77.5	100.0
Industry	769 106	291 679	1 060 785	72.5	27.5	100.0
Building and civil engineering	517 702	449 866	967 568	53.5	46.5	100.0
Wholesale + retail trade and services	2 896 770	1 256 164	4 152 934	69.8	30.2	100.0
<b>Total</b>	<b>4 548 044</b>	<b>3 250 368</b>	<b>7 798 412</b>	<b>58.3</b>	<b>41.7</b>	<b>100.0</b>

	<b>Var. 2003/2004 in %</b>		
	<b>Urban</b>	<b>Rural</b>	<b>Total</b>
Agriculture	18.7	13.3	14.5
Industry	29.6	38.5	31.9
Building and civil engineering	26.2	15.4	21.0
Wholesale + retail trade and services	12.5	15.0	13.2
<b>Total</b>	<b>17.0</b>	<b>16.2</b>	<b>16.7</b>

**Table 11.5 – Agro-food imports and exports**

	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
Total imports comprising:	100	100	100	100
• agricultural commodities	30.4	28.9	26.3	25.5
• foodstuffs	22.1	20.9	19.2	18.3
• non-food products	8.3	7.9	7.1	7.2
Total exports comprising:	100.0	100.0	100.0	100.0
• agricultural commodities	0.8	0.7	0.6	0.5
• foodstuffs	0.1	0.2	0.2	0.2
• non-food products	0.2	0.5	0.4	0.3

**Table 11.6 - Evolution of foreign trade  
(imports rounded up to the nearest million US\$)**

	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>Average 2001- 2004</b>	<b>Var. 2004/ av. 2001- 2004</b>	<b>Var. 2004/ 2003</b>	<b>% 2004</b>
<b>Total Algerian imports comprising:</b>	9940	11969	13533	18232	13418	35.9	34.7	
<b>Agricultural commodities (1+2)</b>	3024	3 455	3 561	4 646	3 671	26.6	30.5	100
<b>1. Foodstuffs</b>	2197	2 506	2 601	3 334	2 660	25.4	28.2	71.8
● Consumer cereals	734	973	898	1 052	914	15.1	17.1	22.6
● Milk and milk products	530	488	514	818	587	39.2	59.1	17.6
● Oils and fats	235	276	342	378	308	22.7	10.4	8.1
● Sugars and sugar confectionery	298	268	230	270	266	1.3	17.3	5.8
● Grain-mill products	23	13	12	28	19	46.6	127.9	0.6
● Coffee, tea, spices	84	83	111	128	101	26.0	14.7	2.8
● Fresh vegetables and pulses	104	87	94	98	96	1.9	3.6	2.1
● Other foodstuffs	189	317	398	563	367	53.5	41.6	12.1
<b>2. Non-food products</b>	827	948	960	1 312	1 012	29.7	36.7	28.2
● Seed cereals and animal feed	256	306	225	304	273	11.6	35.4	6.6
● Wood	209	231	304	339	271	25.1	11.4	7.3
● Crop clippings and animal feed	108	111	118	209	137	53.1	77.6	4.5
● Seed pulses	28	73	54	61	54	12.8	12.8	1.3
● Livestock	8	9	29	83	32	158.3	188.7	1.8
● Other non-food products	218	218	230	316	245	28.6	37.0	6.8
<b>Total Algerian exports</b>	19133	18420	21479	31713	22686	39.8	47.6	
<b>Agricultural commodities (1+2)</b>	151.85	126.92	134.73	163.11	144.15	13.2	21.1	100
<b>1. Foodstuffs</b>	28.40	43.64	51.50	68.01	47.89	42.0	32.1	41.7
● Fresh vegetables and pulses	10.50	16.53	16.55	18.95	15.63	21.3	14.5	11.6
● Wine and beverages	3.50	6.14	6.02	7.13	5.70	25.1	18.4	4.4
● Canned fruit and vegetables	0.60	0.59	0.40	0.71	0.57	22.9	77.5	0.4
● Fisheries products	5.30	5.71	6.58	11.01	7.15	54.0	67.3	6.7
● Milk and milk products	0.00	0.41	5.39	5.85	2.91	100.9	8.6	3.6
● Various preparations	0.00	0.05	0.67	1.00	0.43	131.8	47.9	0.6
● Other foodstuffs	8.50	14.21	15.90	6.86	11.37	-39.6	-56.8	4.2
<b>2. Non-food products</b>	39.10	83.29	83.23	95.10	75.18	26.5	14.3	58.3
● Hides and leathers	25.00	23.10	19.65	13.96	20.43	-31.7	-28.9	8.6
● Cork	14.10	6.67	9.75	12.83	10.84	18.4	31.6	7.9

Source : MADR-DSASI (Directorate for Agricultural Statistics and Economic Studies).

**Table 11.7 - Evolution of agricultural commodities in 2004**

Groups of products	%	Output (1000 ql)				Index			Growth rate 2004 /03
		86-95	2002	2003	2004	2002	2003	2004	
Durum wheat	8	8 530	9 510	18 023	20 017	111	211	235	11
Common wheat	3	3 327	5 508	11 626	7 290	166	349	219	-37
Barley	4	8 351	4 161	12 220	12 116	50	146	145	-1
Oats	0	604	335	775	890	55	128	147	15
<b>Cereals</b>	<b>16</b>	<b>20 812</b>	<b>19 514</b>	<b>42 644</b>	<b>40 313</b>	<b>104</b>	<b>219</b>	<b>206</b>	<b>-6</b>
Fodder	3	9 254	6 335	12 846	19 050	68	139	206	48
Pulses	1	507	435	577	580	86	114	114	0
Industrial tomatoes	1	2 867	4 136	4 302	5 801	144	150	202	35
Tobacco	0	42	59	57	76	140	135	181	34
Horticulture	12	27 090	38 374	49 089	54 800	142	181	202	12
Wine growing	2	1 751	2 344	2 780	2 839	134	159	162	2
Citrus	2	3 112	5 195	5 599	6 090	167	180	196	9
Kernels and pips	5	3 012	5 638	6 339	6 840	187	210	227	8
Olives	1	1 643	1 919	1 676	4 688	117	102	285	180
Dates	5	2 359	4 184	4 922	4 426	177	209	188	-10
<b>Crop production</b>	<b>48</b>					<b>133</b>	<b>193</b>	<b>203</b>	<b>5</b>
Cattle (Growth in 1000 head)	13	487	596	664	669	122	136	137	1
Sheep (Growth in 1000 head)	15	7 970	7 559	9 579	10 007	95	120	126	4
Goats (Growth in 1000 head)	2	1 627	1 484	2 119	2 250	91	130	138	6
White meat (1000Qx)	5	2 127	1 506	1 568	1 700	71	74	80	8
<b>Animal farms</b>	<b>35</b>					<b>101</b>	<b>120</b>	<b>124</b>	<b>3</b>
Milk (10 <sup>6</sup> litres)	11	1 027	1 544	1 610	1 915	150	157	186	19
Eggs (10 <sup>6</sup> units)	6	2 503	3 220	3 302	3 500	129	132	140	6
Honey	0	15	20	21	28	133	140	187	33
Wool	1	195	197	200	230	101	103	118	15
<b>Animal products</b>	<b>17</b>					<b>141</b>	<b>147</b>	<b>169</b>	<b>15</b>
<b>Animal production</b>	<b>52</b>					<b>114</b>	<b>129</b>	<b>139</b>	<b>8</b>
<b>Total agricultural production</b>	<b>100</b>					<b>123</b>	<b>159</b>	<b>169</b>	<b>6</b>

Source: MADR-DSASL.

**Table 11.8 – Cereals output (quintals) and yield (quintals)**

<b>Crops</b>	<b>1999-2000</b>	<b>2000 – 2001</b>	<b>2001-2002</b>	<b>2002-2003</b>	<b>2003-2004</b>
<b>Distribution of output by species (quintals)</b>					
Durum wheat	4 863 340	12 388 650	9 509 670	18 022 930	20 017 000
Common wheat	2 740 270	8 003 480	5 508 360	11 625 590	7 290 000
Barley	1 632 870	5 746 540	4 161 120	12 219 760	12 116 000
Oats	81 700	436 610	334 950	775 460	890 000
<b>TOTAL</b>	<b>9 318 180</b>	<b>26 575 280</b>	<b>19 514 100</b>	<b>42 643 740</b>	<b>40 313 000</b>
<b>Yields by species (ql/ha) (in terms of harvested acreage)</b>					
Durum wheat	8.9	11.1	11.7	14.2	15.3
Common wheat	9.7	11.1	9.4	14.9	10.4
Barley	7.6	11.1	10.4	15.6	13.2
Oats	5.6	8.8	7.5	10.9	12.0
<b>TOTAL</b>	<b>8.8</b>	<b>11.1</b>	<b>10.6</b>	<b>14.7</b>	<b>13.4</b>
<b>Yield by species (ql/ha) (in terms of grain-sown acreage)</b>					
Durum wheat	3.3	8.7	7	13.6	14.6
Common wheat	3.2	9.6	6.8	14.3	9.0
Barley	1.5	6.6	4.6	14.7	11.8
Oats	1.2	7.4	4.7	10.0	11.0
<b>TOTAL</b>	<b>2.7</b>	<b>8.3</b>	<b>6.2</b>	<b>14.0</b>	<b>12.3</b>

<b>Crops</b>	<b>Growth 2004/2003</b>	<b>Average 1991 to 2000</b>		<b>Growth 2004/ (average 91-2000)</b>
	<b>%</b>	<b>Quintals</b>	<b>%</b>	<b>%</b>
<b>Distribution of output by species (quintals)</b>				
Durum wheat	11	10 560 001	45	90
Common wheat	-37	4 529 108	19	61
Barley	-1	7 799 394	33	55
Oats	15	543 740	2	64
<b>TOTAL</b>	<b>-5</b>	<b>23 432 243</b>	<b>100</b>	<b>72</b>
<b>Yield by species (ql/ha) (in terms of harvested acreage)</b>				
Durum wheat	8	9.8	36	56
Common wheat	-30	9.8	42	6
Barley	-15	9.6	4	38
Oats	10	8.2	1	46
<b>TOTAL</b>	<b>-9</b>	<b>9.7</b>	<b>100</b>	<b>38</b>
<b>Yield by species (ql/ha) (in terms of grain-sown acreage)</b>				
Durum wheat	7	6.7		118
Common wheat	-37	6.4		41
Barley	-20	5.7		107
Oats	10	4.7		134
<b>TOTAL</b>	<b>-12</b>	<b>6.2</b>		<b>98</b>

Source : MADR-DSASI.



**Table 11.9 – Acreage, output and yield of artificial and natural fodder**

Crop	2000-2001	2001-2002	2002-2003	2003-2004	Growth 2004/ 2003	Average 1991 to 2000	Growth 2004/ (91-2000)
					%	ha	%
Artificial fodder							
Acreage (ha)	243 520	300 280	272 790	461 589	69.2	359 943	28.2
Output (t)	5 544 460	4 901 790	7 914 890	15 551 250	96.5	6 017 700	158.4
Yield (t/ha)	22.8	16.3	29.0	33.7	16.1	16.7	101.5
Natural fodder							
Acreage (ha)	142 690	101 030	299 020	175 634	-41.3	149 249	17.7
Output (t)	2 535 540	1 433 260	4 930 880	3 498 750	-29.0	2 104 594	66.2
Yield (t/ha)	17.8	14.2	16.5	19.9	20.6	14.1	41.1
Total fodder (artificial and natural)							
Acreage (ha)	386 210	401 310	571 810	637 223	11.4	509 192	25.1
Output (t)	8 080 000	6 335 050	12 845 770	19 050 000	48.3	8 122 294	134.5
Yield (t/ha)	20.9	15.8	22.5	29.9	33.1	16.0	87.4

Source: MADR-DSASI.

**Table 11.10 – Horticultural output (quintals)**

	2000-2001	2001 - 2002	2002-2003	2003-2004	Average	Variation	
					1991-2000	2004/2003	2004/(av. 91-2000)
<b>Real acreage</b> (ha)	268 760	270 490	298 280	317 608	263 887	6.5	20.4
<b>Planted acreage</b> (ha)	277 400	290 690	320 100	345 558	289 463	8.0	19.4
<b>Output</b> (ql)	33 622 030	38 374 160	49 088 610	54 800 000	30 804 100	11.6	77.9
<b>Yield</b> (t/ha)	121.2	132.0	153.4	158.6	106.4	3.4	49.0

Source : MADR-DSASI.

**Table 11.11 – Potato output (quintals)**

	2000-2001	2001-2002	2002-2003	2003-2004	Average 91-2000	Variation in %	
						2004/2003	2004/(91-2000)
<b>Acreage</b>	65 790	72 560	88 660	93 144	84 362	5.1	10.4
<b>Output</b>	9 672 320	13 334 650	18 799 180	18 962 700	10 617 510	0.9	78.6
<b>Yield</b>	147	184	197	203.6	126	3.4	61.6

Source : MADR-DSASI.

**Table 11.12 – Industrial crop output**

	2000-2001	2001-2002	2002-2003	2003-2004	Average 1991-2000	Variation in %	
						2004-2003	2004 / (1991-2000)
Industrial tomatoes							
Acreage (ha)	23 070	24 690	27 080	27 307	28 024	0.8	-2.6
Output (ql)	4 569 970	4 135 770	4 301 640	5 800 780	4 362 664	34.9	33.0
Yield (ql/ha)	198.1	167.5	158.8	212.4	155.7	33.7	36.5
Tobacco							
Acreage (ha)	6 300	5410	5 360	5 498	4 932	2.6	11.5
Output (ql)	77 760	58470	56 740	76 000	54 524	33.9	39.4
Yield (ql/ha)	12.3	10.8	10.6	13.8	11.1	30.6	25.0
Ground nuts							
Acreage (ha)	4 250	3750	3 380	4 081	2 943	20.7	38.7
Output (ql)	46 210	46 160	38 420	42 690	33 539	11.1	27.3
Yield (ql/ha)	10.9	12.3	11.4	10.5	11.4	-8.0	-8.2

Source : MADR-DSASI.

**Table 11.13 – Fruit-tree crop, citrus and vine output (quintals)**

	2000-2001	2001-2002	2002-2003	2003-2004	Average 1991-2000	Variation in %	
						2004/2003	2004/(91-2000)
Fruit-tree crops							
Co-planted acreage	179 640	212 900	250 490	281 490	153 248	12.4	45.6
Acreage bearing fruit (ha)	135 690	141 260	155 330	166 322	129 312	7.1	22.3
Output (ql)	4 684 480	5 638 430	6 339 250	6 840 000	3 728 106	7.9	45.5
Yield (ql/ha)	34.5	39.9	40.8	41.1	28.8	0.8	29.9
Citrus							
Co-planted acreage (ha)	48 640	52 710	56 640	59 368	45 620	4.8	30.1
Acreage bearing fruit (ha)	41 680	42 250	42 942	43 560	40 160	1.4	8.5
Output (ql)	4 700 000	5 195 000	5 599 300	6 091 110	3 733 400	8.8	63.2
Yield (ql/ha)	113	123	130.4	139.8	93	7.2	50.4
Vine							
Co-planted acreage	58 800	68 500	79 990	94 025	97 696	3.9	43.0
Acreage bearing fruit (ha)	51 000	51 500	54 200	60 465	62 532	3.4	2.3
Yield (ql/ha)	40	38	43	38	45.4	19.5	46.5
Output (1000ql)	2 038 000	1 961 600	2 344 000	2 779 680	2 839 000	2.1	49.2

Source : MADR-DSASI.

**Table 11.14 – Olive output**

	<b>1999- 2000</b>	<b>2000- 2001</b>	<b>2001- 2002</b>	<b>2002- 2003</b>	<b>2003- 2004</b>	<b>Variation in %</b>	
						<b>2004/ 2003</b>	<b>2004/ (1991- 2000)</b>
Acreage (ha)	168 080	177 220	190 550	209 730	226 337	7.9	38.3
Olive trees co-planted with other trees	16 702 610	17 388 980	19 008 590	21 583 240	24 616 600	14.1	47.2
Bearing olive trees (number)	15 035 200	15 077 790	15 241 100	15 472 280	16 070 800	3.9	4.4
Total olive output (ql)	2 171 120	2 003 390	1 919 260	1 676 270	4 688 000	179.7	117.0
Olive yield (kg/tree)	14	13	13	10.8	29.2	170.4	108.6
<b>Output</b>							
Oil olive output (ql)	1 824 390	1 667 930	1 441 570	1 041 530	4 100 020	293.7	115.8
Table olive output (ql)	346 730	335 460	477 690	634 740	587 980	-7.4	118.5
Total olive output (ql)	2 171 120	2 003 390	1 919 260	1 676 270	4 688 000	179.7	117.0
Oil output (hl)	333 200	263 880	256 000	165 780	757 070	356.7	127.1
<b>Yield</b>							
Olive yield (kg/tree)	14.4	13.3	12.6	10.8	29.2	170.4	108.6
Oil yield (litres/ql olives)	18.3	15.8	17.8	15.9	18.5	16.4	5.7

Source : MADR-DSASI.

**Table 11.15 – Date palms: number of trees, output and yield**

Million trees	Average 1991/2000	1999- 2000	2000- 2001	2001- 2002	2002- 2003	2003- 2004	Variation	
							2004- 2003	2004/ (1991- 2000)
Number of co-planted trees (10 <sup>6</sup> )	10.3	11.9	12	13.5	14.6	15.3	4.8	48.5
Number of bearing trees (10 <sup>6</sup> )	7.7	8.9	9	9.4	9.6	9.9	3.1	28.6
Output (10 <sup>6</sup> ql)	3.2	3.7	4.4	4.2	4.9	4.4	-10.2	37.5
Yield (kg/tree)	41.6	42	49	45	51.1	44.5	-12.9	7.0

Source : MADR-DSASI.

**Table 11.16 – Forest products**

	2000	2001	2002	2003	2004	Average 2000- 2004	Evolution 2004/ 2003	Evolution 2004/Av. 2000-04
Wood (m <sup>3</sup> )	185 506	129 632	121 120	164 232	184 379	156 974	12.3	17.5
Cork (ql)	123 893	100 545	80 553	69 970	67 808	88 554	-3.1	-23.4
Esparto grass (T)	4 723	1 534	543	747	1 503	1 810	101.2	-17.0

Source : MADR-DSASI.

**Table 11.17 – Animal products**

	Average 1991- 1999	2000	2001	2002	2003	2004	Variation	
							2004/ 2003	2004/ (aver- age 91-99)
Red meat (T)	290 150	250 000	259 800	290 762	300 459	320 000	6.5	10.3
White meat (T)	178 920	198 000	201 000	150 600	156 800	170 000	8.4	-5.0
Milk (10 <sup>6</sup> litres)	1 152	1 550	1 637	1 544	1 610	1 915	18.9	66.2
Honey (T)	1 693	1 100	1 600	1 950	2 051	2 800	36.5	65.4
Wool (T)	21 119	17 462	18 146	19 752	19 908	23 000	15.5	8.9
Eggs (10 <sup>6</sup> eggs)	2 263	2 020	2 160	3 220	3 302	3 500	6.0	54.7

**Table 11.18 - Evolution of the main imports  
in volume and value**

	2003		2004		Growth 2004/2003	
	Volume (tonnes)	Value (10 <sup>3</sup> US\$)	Volume (tonnes)	Value (10 <sup>3</sup> US\$)	Growth in volume	Growth in value
Durum wheat	2 978 067	586 094	3 333 826	704 039	12	20
Common wheat	2 204 709	292 229	1 684 028	318 810	-24	9
Barley - oats	95 132	11 412	38 186	4 886	-60	-57
Maize	1 544 210	211 786	1 790 349	298 350	16	41
Rice	64 893	19 931	71 616	29 191	10	46
Other cereals	8 391	1 654	3 062	1 214	-64	-27
Total cereals	6 895 402	1 123 106	6 921 067	1 356 490	0	21
Powdered milk and cream	211 075	455 251	251 791	745 862	19	64
Rapeseed oil	37 920	22 999	42 252	28 319	11	23
Sunflower oil	240 326	137 568	233 896	150 523	-3	9
Palm oil	135 248	68 651	135 385	73 648	0	7
Soya bean oil	92 402	52 973	151 925	88 022	64	66
Total oils	505 896	282 190	563 458	340 512	11	21
Raw sugar	946 833	222 088	1 078 748	257 218	14	16
Pulses	172 697	98 981	157 741	100 694	-9	2
Plywood	199 568	44 789	84 078	56 984	-58	27
Sawn wood	670 492	240 519	686 737	254 429	2	6

**Table 11.19 - Evolution of the import prices of certain commodities**

	2003			2004			Growth 2003/2004 in %	
	Quantity (tonnes)	Value (1000 US\$)	Price (US\$/ tonne)	Quantity (tonnes)	Value (1000 US\$)	Price (US\$/ tonne)	Price	Quantity
Durum wheat	2 978 044	586 086	197	3 333 826	704 039	211	7	12
Common wheat	2 204 709	292 228	133	1 684 028	318 810	189	43	24
Barley	90 302	10 256	114	38 156	4 872	128	12	58
Maize	1 544 210	211 786	137	1 790 349	298 350	167	22	16
Unrefined sunflower oils for food industry	240 326	137 568	572	233 646	150 415	644	12	3
Unrefined soy- bean oil	92 402	52 973	573	85 412	50 001	585	2	8
Raw sugar	946 833	222 088	235	1 078 748	257 218	238	2	14
Unroasted coffee	104 814	97 458	930	128 712	112 156	871	6	23
Common wheat flour	6 728	1 411	210	30 132	16 169	537	156	348
Maize groats and meal	2 038	669	328	2 654	909	343	4	30
Corn flour	556	361	650	23	11	469	28	96
Corn starch	5 042	1 167	231	8 232	2 563	311	35	63
Unroasted malt	11 225	5 674	505	11 680	6 173	529	5	4
Roasted malt	1 141	599	525	2 173	1 144	527	0	90
Powdered milk	211 075	455 251	2 157	251 791	745 862	2 962	37	19
AMF	431	293	681	1 652	1 537	930	37	283
Sawn or stripped wood	670 492	240 519	359	686 737	254 429	370	3	2
Soybean meal	427 759	105 078	246	591 195	192 709	326	33	38

Source: calculations based on the data of the Algerian customs authorities.

**Table 11.20 – Trade by major economic region (in %)**

	<b>2 003</b>		<b>2 004</b>	
	<b>Exports</b>	<b>Imports</b>	<b>Exports</b>	<b>Imports</b>
EU-15	70	42	65	41
EU-25	70	44	67	31
OECD	80	57	70	56
CIS	1	7	2	5
NAFTA	7	17	5	23
LAIA	3	17	4	6
ASEAN	0	5	2	4
ARAB LEAGUE	14	4	21	2
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: calculations based on the data of the Algerian customs authorities.

**Table 11.21 - Evolution of land developed for leasehold**

<b>Year</b>	<b>Acreage</b>	<b>Lease-holds</b>	<b>Number of jobs created</b>	<b>Expenditure (FDRMVTC)</b>	<b>Cost per ha</b>	<b>Cost per job</b>
	<b>ha</b>	<b>Number</b>	<b>Number</b>	<b>(10<sup>9</sup> DA)</b>	<b>DA</b>	<b>DA</b>
1999	8 509	4 584	5 054	0.80	94 018	158 290
2000	37 905	3 675	16 939	3.04	80 201	179 468
2001	29 286	4 939	11 809	4.75	162 194	402 236
2002	54 091	2 495	23 001	3.89	71 916	169 123
2003	135 368	3 221	22 518	5.77	42 625	256 239
2004	59 823	4 955	37 355	8.21	137 238	219 783
<b>TOTAL</b>	<b>324 982</b>	<b>23 869</b>	<b>116 676</b>	<b>26.46</b>	81 420	226 782

Source: MADR. Directorate for Land Organisation and Property.

**Table 11.22 – Distribution by cost line provided in the 2005-2009 5-year plan**

<b>SECTORS</b>	<b>Amount in billion DA</b>	<b>%</b>
<b>I – Programme for improving the living conditions of the population comprising:</b>	<b>1908.5</b>	<b>45.4</b>
- Housing	555	13.2
- Universities	141	3.4
- State education system	200	4.8
- Vocational training	58.5	1.4
- Public health	85	2.0
- Water supply for the population (excl. major waterworks projects)	127	3.0
- Youth and sports	60	1.4
- Cultural activities	16	0.4
- Connection of households to the gas and electricity mains	65.5	1.6
- National solidarity action	95	2.3
- Developing radio and television	19.1	0.5
- Construction of religious infrastructures	10	0.2
- Area management operations	26.4	0.6
- Municipal development schemes	200	4.8
- Development of the regions in the south	100	2.4
- Development of the regions in the High Plateaus	150	3.6
<b>II – Programme for developing basic infrastructures comprising:</b>	<b>1703.1</b>	<b>40.5</b>
- Transport sector	700	16.7
- Civil engineering sector	600	14.3
- Water sector (dams and transfers)	393	9.4
- Area management sector	10.15	0.2
<b>III – Programme for supporting economic development comprising:</b>	<b>337.2</b>	<b>8.0</b>
- Agriculture and rural development	300	7.1
- Industry	13.5	0.3
- Fisheries	12	0.3
- Investment promotion	4.5	0.1
- Tourism	3.2	0.1
- SMEs and craft trades	4	0.1



**Table 11.22 (contd.)**

<b>SECTORS</b>	<b>Amount in billion DA</b>	<b>%</b>
<b>IV – Development and modernisation of the public service comprising:</b>	<b>203.9</b>	<b>4.9</b>
- Judiciary	34	0.8
- Interior	65	1.5
- Finance	64	1.5
- Wholesale and retail trade	2	0.0
- Post and new information and communication technologies	16.3	0.4
- Other State sectors	22.6	0.5
<b>II – Programme for developing new communication technologies</b>	<b>50</b>	<b>1.2</b>
<b>Total of the 2005-2009 5-year programme</b>	<b>4202.7</b>	<b>100.0</b>

Source: Prime Minister's Office.

**Table 11.23 - Self-supply rate**

<b>Rate of self-sufficiency in food production in %</b>						
	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>
<b>Total winter cereals</b>	<b>29.7</b>	<b>61.4</b>	<b>15.0</b>	<b>40.3</b>	<b>28.6</b>	<b>13.5</b>
Durum wheat	24.2	58.7	15.3	32.9	20.1	10.5
Common wheat	20.8	36.6	8.5	47.5	41.8	18.3
Barley	79.1	100.0	46.4	55.6	43.6	22.3
Oats	100.0	100.0	98.7	99.9	91.1	47.9
<b>Pulses</b>	<b>24.2</b>	<b>31.8</b>	<b>17.0</b>	<b>24.7</b>	<b>21.5</b>	<b>11.9</b>
Unsplit peas	21.9	35.7	7.2	18.8	16.1	10.2
Chick peas	46.9	35.8	28.9	39.7	25.5	15.3
Dried beans	0.5	1.2	1.8	3.1	2.4	1.1
Lentils	1.4	1.7	1.0	1.0	0.8	0.3
Faba beans and broad beans	99.8	100.0	98.3	99.2	93.1	94.7
<b>Horticultural crops</b>	<b>97.3</b>	<b>98.4</b>	<b>92.8</b>	<b>97.4</b>	<b>97.0</b>	<b>94.8</b>
Potatoes	92.9	96.0	81.2	92.6	92.0	90.1
Tomatoes	100.0	100.0	100.0	100.0	100.0	100.0
Onions	100.1	99.9	99.8	100.0	100.0	92.9
Garlic	98.6	88.8	88.0	93.1	97.2	97.7
<b>Animal products</b>	<b>44.2</b>	<b>51.5</b>	<b>45.0</b>	<b>45.0</b>	<b>51.7</b>	<b>51.8</b>
Milk	34.5	43.6	36.3	36.6	44.5	44.7
Eggs	99.7	97.8	98.1	95.7	100.0	99.9
Red meat	90.8	92.6	97.2	94.4	93.2	94.6
White meat	100.0	99.8	100.0	100.0	100.0	100.0

**Table 11.23 (contd.)**

<b>Rate of self-sufficiency in food production in %</b>					
	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>Average 1995-2004</b>
<b>Total winter cereals</b>	<b>35.2</b>	<b>30</b>	<b>44.7</b>	<b>43.1</b>	<b>37.7</b>
Durum wheat	30.9	21.1	37.7	34.4	<b>28.4</b>
Common wheat	31.1	18.4	34.5	31.4	<b>28.5</b>
Barley	62.8	41.2	93.1	97.0	<b>69.6</b>
Oats	81.1	82.6	94.1	100.0	<b>93.7</b>
<b>Pulses</b>	<b>18.1</b>	<b>20.7</b>	<b>25.6</b>	<b>26.2</b>	<b>22.4</b>
Unsplit peas	24.1	25.7	59.6	37.0	<b>24.1</b>
Chick peas	14.9	30.3	27.3	24.9	<b>27.7</b>
Dried beans	1.6	1.6	2.4	2.7	<b>1.8</b>
Lentils	1.0	0.7	0.7	1.5	<b>0.9</b>
Faba beans and broad beans	94.3	83.7	94.9	96.1	<b>95.3</b>
<b>Horticultural crops</b>	<b>96.9</b>	<b>94.7</b>	<b>96.7</b>	<b>96.9</b>	<b>96.3</b>
Potatoes	91.4	88.4	94.9	94.4	<b>91.7</b>
Tomatoes	100.0	100.0	100.0	96.7	<b>99.2</b>
Onions	100.0	98.5	100.1	99.2	<b>99.1</b>
Garlic	95.1	92.3	95.7	89.3	<b>93.5</b>
<b>Animal products</b>	<b>47.4</b>	<b>46.1</b>	<b>49.9</b>	<b>48.4</b>	<b>48.1</b>
Milk	40.7	39.9	41.2	41.2	<b>40.5</b>
Eggs	100.0	100.0	99.8	99.2	<b>99.2</b>
Red meat	98.2	99.3	87.9	78.1	<b>92.1</b>
White meat	100.0	100.0	100.0	100.0	<b>100.0</b>

Source: calculations based on customs data (National Centre for Computer Engineering and Statistics - CNIS).

**Table 11.24 – Financing of the agricultural and rural sector  
(actual expenditure in 10<sup>6</sup> DA)**

	<b>2003</b>	<b>2004</b>	<b>Variation 2003/2004</b>
1 – Public amenities budget of the Ministry of Agriculture and Rural Development	8.24	8.22	-0.3
2- FNRDA National Agricultural and Rural Development Fund	37.41	29.22**	-21.9
3- FDRMVTC. Fund for Rural Development and Land Development through Leasehold	5.77	5.00	-13.3
4- FLDPPS. Fund for Combating Desertification and Promoting the Steppe	1.00	2.60	160.0
5- Total Funds (2+3+4)	44.18	36.82	-16.7
6- Total (1+5)	52.42	45.04	-14.1
7 – Farm income support	2.08	1.28*	-38.3
<b>TOTAL (6+7)</b>	<b>54.49</b>	<b>46.32</b>	<b>-15.0</b>

\* Author's estimation

\*\* Not including farm income support (subsidisation of the production and collection of wheat and milk, subsidisation of the use of certain inputs for certain crops, etc.)

**Table 11.25 – Some data on fisheries in Algeria**

	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
Output (1000 tonnes)	90	113	134	134	142	137
Variation	-3%	26%	18%	1%	5%	-3%
Number of boats	2 464	2 552	2 661	2 880	3 292	3 400
Variation	6%	4%	4%	8%	14%	3%
Seamen	26 591	28 225	29 004	30 544	34 046	37 502
Variation	2%	6%	3%	5%	11%	10%

**Table 11.26 – Balance sheet of the Directorate General for Forestland (1999-2004)**

	2000	2001	2002	2003	2004	General total
<b>Acreage under plantation (ha)</b>	28 624	41 874	36 379	33 209	28 431	168 517
Forest trees (ha)	11 325	6 839	8 138	12 115	14 285	52 702
Fruit-tree plantations (ha)	16 893	33 553	27 298	18 954	12 174	108 872
Vine plantations (ha)	406	1 474	861	2 044	1 937	6 722
Phoenix date palm plantations (ha)	0	8	82	96	35	221
<b>Area under forestry work (ha)</b>	8 000	18 563	19 138	27 819	19 648	93 168
<b>Deferral of grazing (ha)</b>	0	10 000	0	20 000	48 850	78 850
<b>Land improvement (ha)</b>	3 700	1 772	2 006	3 956	6 214	17 648
<b>Clearing of new tracks (km)</b>	210	801	758	1 788	870	4 427
<b>Development of forest tracks (km)</b>	400	1 140	1 321	1 833	1 223	5 917
<b>Torrent regulation (m<sup>3</sup>)</b>	242 941	377 148	418 602	712 623	843 686	2 595 000
<b>Rehabilitation of benches (ha)</b>	2 513	1 326	833	2 748	662	8 082
<b>Development of water holes (units)</b>	0	15	72	237	246	570
<b>Job creation:</b>	48 550	62 595	107 846	129 053	102 601	450 645
Permanent jobs*	20 500	13 563	21 904	18 546	17 122	91 635
Temporary jobs	28 050	11 083	10 662	8 453	9 092	67 340
Number of days of work	5 185 884	1 345 771	963 724	906 842	898 732	9 300 953
Permanent job equivalent (no. of days of temporary work/240)	21 608	5 607	4 016	3 779	3 745	38 755
Casual employment	0	43 425	81 906	106 728	81 734	313 793

**Table 11.26 (contd.)**

	<b>Average 2000-2004</b>	<b>Evolution 2004/2003</b>	<b>Evolution 2004/Average 2000-2004</b>
<b>Acreage under plantation</b>	33 703	-14.4	-15.6
Forest trees (ha)	10 540	17.9	35.5
Fruit-tree plantations (ha)	21 774	-35.8	-44.1
Vine plantations (ha)	1 344	-5.2	44.1
Phoenix date palm plantations (ha)	44	-63.5	-20.8
<b>Area of forestry work (ha)</b>	18 634	-29.4	5.4
<b>Deferral of grazing (ha)</b>	15 770	144.3	209.8
<b>Land improvement (ha)</b>	3 530	57.1	76.1
<b>Clearing of new tracks (km)</b>	885	-51.3	-1.7
<b>Development of forest tracks (km)</b>	1 183	-33.3	3.3
<b>Torrent regulation (m<sup>3</sup>)</b>	519 000	18.4	62.6
<b>Rehabilitation of benches (ha)</b>	1 616	-75.9	-59.0
<b>Development of water holes (units)</b>	114	3.8	115.8
<b>Job creation:</b>	90 129	-20.5	13.8
Permanent jobs*	18 327	-7.7	-6.6
Temporary jobs	13 468	7.6	-32.5
Number of days of work	1 860 191	-0.9	-51.7
Permanent job equivalent (no. of days of temporary work/240)	7 751	-0.9	-51.7
Casual employment	62 759	-23.4	30.2

- \* Permanent jobs: number of beneficiaries of fruit-tree, vine and date palm plantations.  
 Temporary jobs: created in the context of the operating budget of the forestry authorities and other institutions.  
 Casual jobs: created by undertakings which have signed contracts with the DGF to carry out projects.

**Table 11.27 – Development of land by leasehold  
Situation concerning cumulated projects (since 1999)  
by ecological zone as at 31-3-2005**

	<b>Acreage ha</b>	<b>Number of lease- holds</b>	<b>Number of jobs created</b>	<b>Acreage %</b>	<b>Lease- holds %</b>	<b>Number of jobs created %</b>	<b>ha/ lease- hold</b>
Mountains	127 811	11 968	53 801	37	49	40	10.7
Steppe	207 403	7 908	73 031	60	33	55	26.2
South	11 451	4 442	7 128	3	18	5	2.6
<b>Total</b>	<b>346 665</b>	<b>24 318</b>	<b>133 960</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>14.3</b>

Source: MADR. Directorate for Land Organisation and Property.

**Table 11.28 - Development of land by leasehold  
Situation of cumulated projects (since 1999)  
by management system  
as at 31-3-2005**

	<b>Acreage ha</b>	<b>Number of leaseholds</b>	<b>Number of jobs created</b>	<b>Acreage %</b>	<b>Lease- holds %</b>	<b>Number of jobs created %</b>	<b>ha/ lease- hold</b>
Rain-fed	193 862	10 027	53 444	56	41	40	19
Irrigated	152 802	14 291	80 516	44	59	60	11
<b>Total</b>	<b>346 664</b>	<b>24 318</b>	<b>133 960</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>14</b>

Source: MADR. Directorate for Land Organisation and Property.

**Table 11.29 – Fisheries product imports**

	Quantities (tonnes)			Value (10 <sup>6</sup> US\$)		
	2002	2003	2004	2002	2003	2004
1. Frozen white tuna (Thunnus)	1 882	8 045	5 842	1.8	5.5	6.0
2. Frozen hake (Merluccius)	2 347	3 955	4 446	1.2	2.8	4.1
3. Other frozen fish	1 567	4 405	5 017	0.8	3.5	5.1
Subtotal 1+2+3	5 795	16 405	15 304	3.8	11.8	15.2
4. Other fish	3 610	3 500	5 168	2.8	3.7	6.5
<b>Total imports</b>	<b>9 405</b>	<b>19 905</b>	<b>20 472</b>	<b>6.6</b>	<b>15.5</b>	<b>21.7</b>

	Evolution quantities			Evolution value			Price per tonne US\$		
	2002	2003	2004	2002	2003	2004	2002	2003	2004
1. Frozen white tuna (Thunnus)	100	427	310	100	303	331	964	683	1 028
2. Frozen hake (Merluccius)	100	169	189	100	243	357	494	712	931
3. Other frozen fish	100	281	320	100	436	631	513	795	1 012
Subtotal 1+2+3	100	283	264	100	313	403	652	720	995
4. Other fish	100	97	143	100	131	235	770	1 043	1 262
<b>Total imports</b>	<b>100</b>	<b>212</b>	<b>218</b>	<b>100</b>	<b>236</b>	<b>332</b>	<b>697</b>	<b>777</b>	<b>1 062</b>

Source : national customs authorities (CNIS).

**Table 11.30 – Balance of trade in fisheries products**

		1999	2000	2001	2002	2003	2004	Increase 2003/2004
<b>Imports</b>	Tonnes	7 809	7 902	7 893	11 242	19 905	20 472	3
	1000 US\$	13 170	16 900	13 880	8 970	15 466	21 744	41
	US\$/Tonne	1 687	2 139	1 759	798	777	1 062	37
<b>Exports</b>	Tonnes	905	1 452	1 632	2 479	1 852	1 947	5
	1000 US\$	2 880	4 700	5 350	5 880	6 880	9 495	38
	US\$/Tonne	3 182	3 237	3 278	2 372	3 715	4 876	31
<b>Balance</b>	1000 US\$	-10 290	-12 200	-8 530	-3 090	-8 586	-12 250	43
<b>Import-export ratio</b>	%	22%	28%	39%	66%	44%	44%	

Source : calculated on the basis of customs data.

## **12 Egypt**

### **12.1 - Developments at the macroeconomic policy level**

#### **12.1.1 - Introduction**

The recent low level of foreign investments in Egypt and the efforts to fully integrate the Egyptian economy into the global economy have had their impact on Egyptian economic policy in the year under review. We have witnessed a number of developments in this respect, the most important of which are:

- Legislative amendments including various laws regulating the economic arena in Egypt on the one hand, and Egypt's relationship with the economic world on the other. This is illustrated by many examples such as:
  - New amendments to the law on investment incentives and guarantees, the objective being to provide more facilities for investment procedures for all investors whether Egyptian or foreign. This was done in order to encourage investment and overcome its obstacles.
  - Amendments to the customs law lifting the restrictions on imports, the objective being to activate various economic sectors and provide the opportunity for all investors to implement all production requirements at lower cost. A further aim is to eliminate a number of distortions in the customs tariffs system, which were causing a great deal of bureaucracy. As the result of the reductions introduced by this law, Egypt has reached the required final tariff level to be implemented by the beginning of 2005 according to Egypt's commitments to the World Trade Organisation (WTO), and has even gone beyond that level in accordance with the above-mentioned objectives.
  - Establishment of the Standard Customs Tax Centre to assist in the improvement of the customs procedures.
- Activation of more economic agreements and arrangements. The implementation of the Liberalisation of Trade Agreement between the Arab countries commenced at the beginning of 2005, for instance. Furthermore, the QIZ Agreement (Qualified Industrial Zone) was signed and began to be implemented between Egypt, the US and Israel, introducing a unilateral preferential rate for all products manufactured in the qualified industrial zones (industrial zones selected for deals by virtue of the agreement). This agreement includes: the freedom of immediate entry for all products manufactured in this zone into the US market duty-free and exempt of quotas or restrictions as long as the products comply with the rules of origin. These rules state that 11.7% of Israeli inputs (of the manufacturer's production price in the selected zones) should be included in the case of commodities exportable to the US market.



- Development of the basic structural projects related to the industrial zones.
- Liberalisation of the Egyptian pound on the foreign exchange market. In addition, adoption of a monetary and financial policy of expansion, and, finally, reduction of government intervention in market forces to a minimum in terms of wages and prices.
- Introduction of a new tax law tending to reduce the tax burdens imposed on investors and to diminish the bureaucratic constraints involved in dealing with the Tax Department. The major modifications of the law included:
  - Reducing the minimum tax rate to 20% on individuals and companies;
  - Eliminating the tax on income from securities;
  - Unifying the tax rates for all types of companies (partnerships, joint stock companies, financing companies, financial holding companies, ...etc).
  - Obliging the Tax Department to accept the tax declarations submitted to it.
- Creation of a new Ministry of Investment overseeing and controlling all economic sectors related to investment, such as the public works sector, the general authority for investment and free trade areas, the general authority for the financial market, the insurance sector and housing finance. The objective of the new ministry was defined as “to improve the investment climate, remove the obstacles that stand in the way of national and foreign investors, increase the trust between investors and the government, and eliminate the overlap of investment regulation laws”.

### ***12.1.2 - Macroeconomic indicators***

These developments were accompanied by a trend reflected by the macroeconomic indicators as follows:

**Table 12.1 – Macroeconomic indicators**

<b>Items</b>		<b>2000-01</b>	<b>2001-02</b>	<b>2002-03</b>	<b>2003-04</b>
1.	Employment (number in million)	18.0	19.7	18.2	18.7
2.	Unemployment rate %	8.4	9.0	9.9	9.9
3.	Gross Domestic Product (GDP) at factor cost (at current prices (£E bn)	338.6	363.1	388.06	426.048
4.	Growth rate %	3.4	3.2	3.1	4.2
5.	Gross Agricultural Product (£E bn)	56.9	60.9	62.6	67.8
6.	Growth rate % (Agri Sector)	3.6	3.6	2.8	3.2
7.	Gross domestic investment (£E bn)	66	68	71	76
8.	National investment/ GDP%	18.3	17.8	17.1	16.7
9.	Direct Foreign Investment / GDP%	9.0	9.5	8.2	
10.	Direct Foreign Investment (in million US\$)	510	580	530	
11.	Average annual inflation rate %	2.4	2.4	3.2	4.9
12.	Trade balance (US\$ mn)	(9 363.1)	(7 516.5)	(6 615)	(7 523)
13.	Revenue from tourism (US\$ mn)	4 316.9	3 422.8	3 796.4	5 475*
14.	Foreign investment (US\$ mn)	509.4	428.2	700.6	407.2*

\* Tentative.

(£E bn): billion Egyptian pounds.

(US\$ mn): million US dollars.

Source:

1. National Bank of Egypt – Economic Bulletin – Issue 4 , Vol.57 , Cairo, 2004.
2. Central Bank of Egypt – Annual Time Series – [www.cbe.gov.eg](http://www.cbe.gov.eg)

Perhaps one of the most prominent developments to be observed in this table is the increase of the country's foreign currency revenue (transfers by migrant workers, revenue from tourism and oil). What is also to be observed is the improvement in GDP growth rate as well as the increase in GAP. On the other hand, the trade balance deficit has begun to increase again, the rate of foreign investment flow has decreased, and the inflation rate has increased. All such indicators point to the instability of economic policy and fluctuations in growth rates from one year to the next.

**Table 12.2 - Shares of the major sectors in GDP (%)**  
**2001/2002-2003/2004**

<b>Sector</b>	<b>2001/2002</b>	<b>2002/2003</b>	<b>2003/2004</b>
Agriculture	16.8	16.8	15.9
Industry, construction & electricity	24.1	25.4	24.9
Oil & oil products	7.6	7.6	9.6
Other	50.2	50.2	49.6

Source:

1. Ministry of Planning – Socio-Economic Development Plan (2002-2007).
2. CAPMAS (Central Agency for Public Mobilisation And Statistics) – Annual Statistics Book, successive issues.

The past year has witnessed a change in the relative shares of the economic sectors which generate GDP as illustrated in Table 2. The data indicate the decrease in the shares of agriculture and the industry & construction sector and the increase in the share of the oil & oil products sector. This development could be interpreted in terms of the continuous increase in the prices of oil & its products during the recent period.

### ***12.1.3 – The agricultural sector and the national economy***

Despite the fact that the year 2002/2003 witnessed a decrease in the percentage of the agriculture sector's contribution to both GDP and total investments, the sector has continued to play a vital role in the Egyptian national economy. It accounts for approximately 28% of labour in the national economy and 9.5 of total investments, and it exported approximately two-thirds of the commodity exports in the 2003/2004 period.

**Table 12.3 - Percentage of the agricultural sector's contribution to the national economy 2000/2001-2002/2003**

<b>Indicator</b>	<b>2001/2002</b>	<b>2002/2003</b>	<b>2003/2004</b>
Labour	27.7	28	27.9
GDP	16.8	16.8	15.8
Investments	13	9.4	9.5
Bulk commodity exports	47.5	61.5	62.6

Source:

1. CAPMAS - Annual Statistics Book, successive issues.
2. National Bank of Egypt– Economic Bulletin – successive issues: [www.mop.gov.eg](http://www.mop.gov.eg)

The agricultural sector achieves a growth rate amounted to approximately 3.3% on average during the 2001/2002 to 2003/2004 period. In the most recent period,

this rate has been stable despite the changes and swings in the growth rate of the national economy as a whole.

**Table 12.4 - GDP growth rate and the agricultural sector (%)**

Years	GDP	Public	Private	Agriculture	Public	Private
2000/2001	3.4			3.6		
2001/2002	3.2			3.6		
2002/2003	3.1	3.7	2.9	2.8	2.2	2.8
2003/2004	4.2	2.9	5	3.2	3.3	3.3

Source: Ministry of Planning – Annual Monitoring Report 2003/2004 for the government's five-year plans.

As illustrated in the data of Table (4), the agricultural sector achieved a growth rate in the last year (2003/2004) of 3.2% in a new return to growth after the decrease registered in this rate the previous years. This growth was accompanied by a similar growth in the national indicator, which reached approximately 4.2% after an opposite trend that continued throughout the previous periods – 2000, 2001, 2002, and 2003. However, in spite of the great opportunities and potential available for the private agricultural sector, its growth rate did not differ much in the last year from that of the government agricultural sector.

The growth rate achieved by the private sector, although at the level of the national economy as a whole, is about double the rate achieved by the government sector. The increase in growth rate in the agricultural sector from 2.8% to about 3.2% during the last year occurred as a result of the developments introduced in agricultural policy (exports and production) with a view to encouraging producers to produce and improve products as mentioned in detail in one of the following sections.

## **12.2 - Agricultural resources and agricultural production**

### **12.2.1 - Land resources**

Despite the tremendous political propaganda for horizontal agricultural expansion programmes in desert lands, the statistics do not indicate any appreciable improvement in the cultivated area. In other words, the area reclaimed in 2003/2004 did not exceed some 18 000 feddans (7 500 hectares). It was expected that the area of land reclaimed would increase in the South Valley (Toshka & East Owainat Project) but, due to investors' tardiness in that region, it did not add what was anticipated to the cultivated area, although the government has completed the implementation of most of the infrastructure projects in the region. The region is anticipated to add about 210 thousand hectares of agricultural lands. As a result of

this, the per capita of population and employees in the field of cultivating the agricultural lands has decreased as illustrated in table (5).

**Table 12.5 - Land and human resources in Egyptian agriculture**

<b>Resource</b>	<b>2000-01</b>	<b>2001-02</b>	<b>2002-03</b>	<b>2003-04 (mid year)</b>
Population (million)	63.9	65.3	67.3	68.6
Total labour force	17.9	17.9	18.4	18.7
Agricultural labour (million)	5.06	5.1	5.1	5.2
Share of total labour force in %	28	28.7	28.6	28
Cultivated area (million feddans)	8.9	8.2	8.1	8.1
Average agricultural area per capita	0.1236	0.1256	0.120	0.118
Agricultural labour's average share of agricultural area	1.56	1.60	1.59	1.6

Source: CAPMAS –Statistical Year Book, successive issues.

The consequence of this situation is tangible not only in that land resources cannot meet the Egyptian population's needs in terms of food and nutrition commodities as well as the raw materials for a large number of processing industries, but also in the spread of the phenomenon of "disguised unemployment" in this sector due to the accumulation of a growing labour force on the same cultivated area.

**Table 12.6 - Horizontal expansion in Egyptian agriculture**

<b>Year</b>	<b>Reclaimed area (1000 feddan)</b>	<b>Index (1999/2000 = 100)</b>
1999/2000	22	100
2000/2001	12.7	57.8
2001/2002	28.7	130.5
2002/2003	18	81.8
2003/2004		

Source: CAPMAS – Statistical Year Book, successive issues.

The cultivated land is exposed to many dangers, which affect both the cultivated area and soil quality. On the one hand, urban expansion, which has reached the agricultural areas bordering on large cities, is leading to the rapid expansion of both service and industrial buildings and units as well as housing. This construction activity is gradually encroaching on areas of cultivated land. Moreover, due to the increasing number of residents in rural areas and their growing need for dwellings, increasing areas of agricultural land are being converted to civilian use. This phenomenon is exacerbated by the style of construction and buildings in Egyptian villages, where dwellings extend horizontally rather than vertically. Furthermore, local policies are limited and the local administrations do not devote adequate serious thought to the issue of

stopping residential encroachment on agricultural lands. Some estimate that about 15%-20% of agricultural area has been converted from productive to residential use.

The cultivated areas may face the risk of deterioration in quality due to the policies regulating irrigation processes and agricultural deflation, i.e. reliance on the re-use of agricultural drainage water for irrigating increasing areas of farmland is growing. It is well known that this kind of water, which is expected to amount to approximately 1/3<sup>1</sup> of the water used in irrigation, contains high percentages of ammonium (salts) and mineral components, a fact which in turn has negative effects on the nature of the irrigated soil.

Furthermore, the prevailing system of agricultural land inheritance in Egypt leads to the continuous division and shrinking of agricultural property (holdings), which is converted to poor productive units, i.e. units which produce only for subsistence and not for market. This is due to the fact that such young owners are unable to own modern agricultural equipment, let alone using it, a phenomenon which is further aggravated by the absence of legislation or social regulation or any kind of economic incentives which would halt the process of farm division into micro units.

### **12.2.2 - Water resources**

There has been no change whatsoever in Egyptian water resources for a very long time. The country depends largely on the river Nile for providing agricultural irrigation as well as drinking water and water for other civilian uses. With the steadily growing population, the increasing rate of urbanisation and the expansion of cultivated areas, the limited amount of water available is thus now facing major challenges in terms of its ability to fulfil national water needs.

Both the Ministry of Irrigation and the Ministry of Agriculture are making tremendous efforts to rationalise the consumption of the limited amount of water available. These efforts are implemented in a number of strategies simultaneously in order to obtain the greatest possible benefit from the available water resources.

The first strategy involves a package of rationalisation and improvement operations targeting irrigation and agricultural drainage in particular. The water users associations (NGOs) have a major role in this field, since they play an important part (in a large area of agricultural land) in organising irrigation shifts, decreasing losses during irrigation and maintaining canals and water transport machinery.

The second line of policy concerns modifying crop components and expanding the cultivation of crops and varieties which need little water and are more drought-resistant than others. This also includes replacing crops and species which consume much of the irrigation water with crops which have a short growth period.

---

<sup>1</sup> Agriculture & Food in Egypt 2020 – Dr. Mahmoud Abd El-Fattah.

One of the most important programmes in this field concerns the replacement of rice and sugarcane (which are highly consumptive of water resources) with new species which grow and ripen in a short period and consequently require less irrigation water.

The third strategy concerns expanding the use of drainage water blended with fresh water in percentages which make it fit for re-irrigation. Some studies point out that in the future some 12 billion m<sup>3</sup> of agricultural drainage water could be re-used to meet irrigation needs. As is illustrated in Table 7, approximately 5 billion m<sup>3</sup> of this water is being used at the present time. Furthermore, some industrial waste water is used after being treated, i.e. after the pollution level has been reduced to a minimum. The data in Table 7 show that this share does not exceed 0.2 billion m<sup>3</sup>.

The fourth strategy includes measures to develop and improve the methods for using groundwater (both shallow and deep groundwater) and thus to increase its utilisation after estimation of the real volume. More than 5 million m<sup>3</sup> of this water is currently being used in desert areas in northern and southern Egypt.

Despite these efforts, water needs are growing due to population growth (approximately 2% per year) and increasing urbanisation and industrialisation. This will result in a constant decrease in the per capita share of water. Studies show that that share has dropped in Egypt to below 1000 m<sup>3</sup>/year and that unless the country develops its water resources and improve their utilisation it will be included in the list of countries suffering from water shortage.

Egyptian water resources, which are already limited, are exposed to a number of dangers which affect their availability in terms of quantity and quality. Nile water, for instance, is subject to various forms of pollution, which deteriorate its quality. The major sources of pollution are:

- the high percentage of poisonous chemical elements in agricultural drainage water due to excessive use of chemical fertilisers and insecticides;
- the wastewater from drainage and industry in villages, cities and factories which discharge their wastewater straight into the Nile and the major canals.

The negative impact of this pollution is tremendous because it decreases the possibility of re-using drainage water for irrigating farmland.

In addition to the environmental dangers threatening the water of the Nile, there are several political dangers which have started to increase noticeably over the past few years. These dangers are due to the attempts by certain upstream countries to re-organise the rights of the downstream countries. Some of these countries have set up huge irrigation and electricity projects increasing the amount of Nile water they use, and this could well affect Egypt's share of water.

**Table 12.7 - Total water resources and needs of the consumer sectors**

Resources (billion m <sup>3</sup> )		Needs (billion m <sup>3</sup> )	
Source	Quantity	User sector	Quantity
Nile water	55.5	Agriculture	53.1
Re-use of agricultural drainage water	4.5	Industry	7.5
Treated drainage water	0.7	Drinking and civilian use	4.5
Shallow groundwater	4.8		
Deep groundwater	0.6		
<b>Total</b>	<b>66.1</b>	<b>Total</b>	<b>65.1</b>

Serious attempts have been made to create a mechanism for cooperation amongst the Nile Basin Countries in order to improve the rate of water benefit for all (riverhead and mouth). Important proposals have been made in this respect regarding the conducting of joint research and the implementation of common projects by the Nile Basin Countries in addition to other positive attitudes to stimulating cooperation amongst the Nile Basin Countries rather than contention over water.

### **12.2.3 - Agricultural labour**

As is illustrated in Table 8, there is relative stagnation in the number of workers in general and in agricultural labour in particular. Increase in both cases has not exceeded 1000 workers. The agricultural labour force and the share of the agricultural sector in employment at the national level have remained constant (5 million and 28% respectively).

**Table 12.8 - Number of employees in the national economy and in the agricultural sector and their productivity throughout 2000/2001-2003/2004**

Years	Total working population (1000)	Agricultural workers (1000)	Agricultural workers as a % of the total working population	GAP (£E million)	Productivity (£E)	Index 2000/01 =100
2000-01	17 984	5 069	28.2	47 900	9 450	100
2001-02	17 950	5 119	28.5	49 500	9 670	102
2002-03*	18 179	5 153	28.3	60 330	11 707	124
2003-04	18 659	5 206	27.9	67 834	13 164	139

\* Based on 2001/2002 figures.

Source: CAPMAS Resource Centre.

Despite these figures, the ratio of agricultural labour to the limited area of agricultural land is considerably high when compared to the figures in a large



number of countries. In many countries, this figure can reach tens or hundreds or even thousands of hectares of farmland per agricultural worker.

This situation explains the spread of the phenomena of direct unemployment and disguised unemployment in the Egyptian agricultural sector. What makes it more serious is the fact that educated rural people are also unemployed and the fact that job opportunities resulting from the limited investments effected in rural areas are rare.

Despite this situation, due to the growth achieved by the sector, which was clearly reflected in both GDP and GAP growth, agricultural labour productivity has increased during the period under review. The labour productivity index rose to 141 in 2003/2004 compared to 100 in 1999/2000, yet despite this clear increase, the rate is still below the productivity increase rate registered in the other sectors of the national economy.

### **12.3 - Agricultural policies**

The agricultural policies pursued since the adoption of structural reform – liberalisation of the sector with a view to diminishing the government's role in agricultural activity, privatisation of government-owned production units by the government, and at the same time providing every opportunity for the private sector to play a fundamental role in agricultural development – have continued (the government's role being limited merely to conducting scientific and technological research and guiding producers as to how to use the results of that research). In this respect, the government is implementing a long-term strategy for developing agriculture with a time schedule extending until 2017. This strategy includes direct focus on the following major lines of policy:

#### ***12.3.1 - General objectives of agricultural development policy (until 2017)***

- To invest more effort in and devote greater attention to scientific agricultural research authorities. The Cairo Branch of the "International Institution for Food Policies Research" is scheduled to open next year with a view to supporting research activities targeting Egyptian agriculture.
- To develop agricultural extension programmes, linking research with extension and transfer technology, to expand extension activities in order to include the fields of marketing and agricultural extension geared to women, to raise the awareness of the population, to develop environmental protection and maintain water and land resources alongside agricultural production.

- To develop the statistical database on agricultural activities and make it available to researchers and scholars on the World Wide Web (Internet).
- To rationalise the consumption of irrigation water and make changes in yield structure so that reliance on yields consuming less water will increase. In addition, to encourage the role played by NGOs played in both water protection and the facilitation of water use.
- To decrease reliance on chemical fertilisers and insecticides and thus increase reliance on the use of integral biological pest-control programmes.
- To devote attention to integral rural development and highlight the role of rural women in agricultural development.
- To increase the volume and type of national production of various agricultural commodities as well as animal, poultry and fish production.
- To develop veterinary guidance efforts.
- To develop sources of agricultural credit and support the Principal Bank for Development and Agricultural Credit (PBDAC) in order to enable it to play its role to the full.
- To develop various forms of agricultural cooperatives as well as the agricultural producers' unions and to resolve their legislative, financing and organisational problems in order to enable them to play their role in development.
- To provide the basic structure needed for reclaiming desert land and encourage investment in horizontal expansion efforts.

With these aims in view, the following action to develop the most important lines of this policy in the short term could be outlined as follows:

### ***12.3.2 - Investment policy***

In the past few years, the share of the agricultural sector in national investments has followed a trend which obviously contradicts the government's declared strategy. As is illustrated in Table 9, the absolute size of such investments is low in general except for the last year, when the investments allocated to agriculture began to increase again, albeit very slightly. This downward trend was accompanied by an upward trend in total national investments, a fact which led to a sharp fall in the share of agricultural investments in total investments over the last few years.

**Table 12.9 - Total investments and agricultural investments  
(1999/2000-2003/2004) in £E million**

Year	Total investments	Agricultural investments	Agricultural investments as a % of total investments
1999/2000	67 000.0	9 893.0	14.7
2001/2002	67 511.5	9 593.5	14.2
2002/2003	68 103.0	6 403.6	9.4
2003/2004	78 084.4	7 440.0	9.5

Source: National Bank of Egypt, Economic Bulletin, various issues.

Table 10 shows clearly that private investment accounts for the major share of agricultural investments (even if the rate has decreased in recent years) exceeding that of the government sector. This trend might explain the decreasing rates of horizontal expansion and the limited expansion of cultivated area, which has only increased slightly in recent years, i.e., private capital has been dedicated to investment in the fast income-generating and highly profitable projects of the sector such as fish and animal production as well as the production of cash and export crops. At the same time, government investment has been dedicated to horizontal expansion projects, the construction of infrastructures, the implementation of irrigation and drainage projects and the continuation of existing projects.

**Table 12.10 - Share of the public and the private sectors in agricultural investment in £E million**

Year	Government	%	Private	%	Total in million
1999/2000	3 573.6	36	6 319.4	64	9 893
2001/2002	3 696.5	38.5	5 898	61.5	9 593.5
2002/2003	2918.7	45.4	3 508.5	54.6	6 427.2
2003/2004	3 414	46	4 000	54	7 414

Source: Ministry of Planning, Economic and Social Development Plan 2001, Five-Year Plan (2002-2007).

### **12.3.3 - Production policies for agricultural crops**

In general, Egyptian agricultural policy aims to increase the production of various agricultural crops with a view to meeting local industrial and food needs as well as the needs of foreign markets for such crops and products.

The government is focusing in particular on strategic export crops such as cotton, vegetables and fruit as well as strategic food crops such as cereals, sugarcane, sugar beet and oil products.

Due to the crucial importance of cereals and cotton within this policy, we shall endeavour to illustrate them in detail below.

#### 12.3.3.1 - Cereals policy

Egypt suffers from a state of chronic imbalance in the ratio of cereals output to cereals consumption. The country's dependence on imports to bridge the cereals gap is steadily increasing. Agricultural policy thus aims to reduce that gap to a minimum in order to achieve complete self-sufficiency in such vital crops.

With this in view, agricultural policy is based on the following strategies:

- a) Horizontal expansion: by increasing the grain-sown area at an annual rate of 10%-15%. This could be achieved by encouraging producers to grow such crops and decrease the areas sown with other crops in the agricultural cycle. Furthermore, various incentives should be provided such as mechanical services, extension services and weed control in addition to the service of ploughing the subsoil for half the normal cost and instructing the PBDAC to pay half the price of yields in advance to producers on the understanding that the rest of the price will be paid when the crops are supplied to the Bank's stores.
- b) Vertical expansion: through constant work in research centres to develop and cultivate highly productive varieties which are resistant to disease, epidemics and insects, and through measures to provide agricultural extension to help implement scientific technical recommendations and to continue to grow various ranges of crops in the areas suitable for such ranges in terms of soil and environment.
- c) Participation in the marketing process: by stepping up the construction of suitable stores which meet the technical requirements for preserving the quality of cereals and improving crop transport methods. All of these measures aim to decrease the percentage of crop loss and damage.
- d) Implementation of a suitable pricing policy: this aims to save a profit margin for producers which encourages them to grow the commodity again the following years as described in detail in the section on "Pricing policy".
- e) Devoting attention to the manufacturing of bread as well as other cereal foodstuffs with a view to improving the nutritious quality of cereals. Furthermore, improving the population's negative cereals consumption habits.

#### 12.3.3.2 – Cotton policy

Agricultural policy in this field is based on the following factors:

- a) Estimating the target area: this is done by estimating the target quantities that could be exported according to studies and international market forecasts on the anticipated volume of production and demand and the amounts required for domestic consumption. Furthermore, the amounts of cotton remaining from previous years should also be taken into consideration.

b) Taking all measures which help to achieve the highest yield from the smallest possible area given the current shortage of agricultural land. This can only be done by working along the following main lines of policy:

1- In the crop species field:

by breeding the species with the highest yield and shortest growth period, species which are resistant to grasses and epidemics, species which withstand high temperatures, lack of water and salinity. This can only be done a) by using foreign germ plasma to support the breeding of such species, b) through close cooperation between research centres working on the cotton crop (both in Egypt and abroad). On the other hand, such cooperation can lead to improvement of the technology used in the various stages of cotton growing and production.

2- In the agricultural extension field:

by training advisers specialising in all stages of crop production and by providing the necessary financial, logistic and technical facilities which enable them to perform their role in guiding farmers in good time towards different agricultural procedures; furthermore, by encouraging farmers themselves to take advantage of these agricultural extension services.

3- In the field of pre-sowing operations, while the crop is growing and at harvest: by making all the necessary efforts through the various government units in the different agricultural areas to carry out such operations in good time. For instance, the government could:

- bear 50% of the cost of most of these operations,
- provide loans to farmers at reasonable interest rates to enable them to carry out such operations,
- devote attention to combating epidemics by organic means and to massively decreasing chemical pest control.

4- In the field of marketing:

the Ministry of Agriculture is taking the necessary measures to preserve the purity of the various species and prohibit hybridisation, to open up a variety of new market outlets for crops and to encourage both the private and the cooperative sector to participate in the marketing process.

As will be illustrated in detail, the government determines a guarantee price for crops, which is adjustable on a weekly basis, the objective being to achieve a profit margin for farmers to encourage them to grow the commodity again the following years.

### **12.3.4 - Agricultural pricing and subsidisation policy**

#### **12.3.4.1 - Agri-pricing policy**

The government has continued to abide by its policy of ceasing to intervene in the agricultural commodity markets as well as in the agricultural equipment market. However, the need to guarantee an increase in the production of certain major crops urges the government to intervene through its policy for those crops, namely wheat, sugarcane and cotton. Government intervention takes the form of intervention in the markets of these crops by announcing the government's willingness to purchase crops at prices known as "*Guarantee prices*" before the beginning of the crop-growing season. This is to encourage the farmers to expand the areas planted with these crops or to supply them to the government authorities concerned. Through this method the government will be able to control the market of these commodities internally. The guarantee price, at its minimum limit, is usually higher than production costs. At its ceiling, the guarantee price is higher than the international prices for the crops. One of the consequences of this policy was seen in wheat yield in the 2004/2005 agricultural season, when the government announced a guarantee price for wheat that was equal to the international price at the time of cultivation and exceeded the local price by about 14%. This resulted in an increase of about 16% in the area sown with wheat<sup>2</sup>. This will undoubtedly mean higher output and a higher percentage of supply to the government store; the government also announced a guarantee price for cotton which exceeded the international price during the crop-growing season by 20%-30%.

The same policy is also followed with sugarcane. There are also plans to create a fund for stabilising the prices of agricultural crops, which would be financed by the difference between the guarantee prices and the international prices for agricultural crops where the international prices exceed the guarantee prices. This revenue would be expended on compensating farmers when the international prices are lower than the guarantee prices.

This system is also applied to agricultural inputs because the government's role is restricted only to intervening in the distribution of some of these inputs through the channels it controls such as the PBDAC and its branches in the different villages as well as the agricultural cooperatives. This is done in return for fixed prices in order to eliminate the monopolisation of these inputs (particularly fertilisers) by the private sector and to provide them at a suitable time and at a suitable price for agricultural producers. This method has played an important role this year in directing resources. It has guaranteed the availability of fertilisers for various agricultural crops, making them available to small producers, who cultivate the major part of agricultural land in Egypt.

---

<sup>2</sup> Al-Ahram Economics – issue 1881 of 24/01/05.

In addition to these positive impacts of pricing policy on the achievement of the objectives of government agricultural policy, allowing prices to be determined by the interaction of the forces of supply and demand - with the absence of institutions which complement market mechanisms (such as marketing and cooperative institutes, consumer protection associations, etc.) and maintain the profits of the producers and consumers by confronting the merchants and monopolising dealers in such agricultural commodities – has led to an increase in marketing margins (difference between the farm price and the consumer price) for many agricultural commodities. This increase was very marked, amounting to approximately 103%, 53.7%, 46.0% and 34% for potatoes, tomatoes, rice and maize respectively in 2003 (see Appendix 17).

The result was that producers were no longer getting a fair (economic) price for their products.

However, in most cases these procedures still do not suffice to address the dysfunctions resulting from the liberalisation of the agricultural sector. The government thus provides some financial aid in the form of direct or indirect subsidies for certain agricultural commodities and products and certain agricultural inputs. We shall review the major developments in this field in the following section.

#### 12.3.4.2 - Subsidisation of foodstuffs

To protect the population segments with low incomes and guarantee the availability of the major commodities for them, the government allocates cash amounts annually to subsidise the prices of a number of such commodities as illustrated in Table 11. The government will thus guarantee that such commodities are available at prices which the majority of consumers can afford. As a complementary procedure, the government applies the system of “supply coupons” which enable the delivery of fixed allocations of foodstuffs to certain population groups.

**Table 12.11 - Value of food subsidies from 2000 to 2004  
in £E million**

	1999/2000		2000/2001		2001/2002		2002/2003		2003/2004	
	Value	%	Value	%	Value	%	Value	%	Value	%
Bread & wheat *	2 861	66.3	2998	67.6	3 083.9	68	3 624	78.8	6 024	79.3
Sugar	799	18.5	814.7	18.4	839.8	18.5	6 31.6	17.6	459	6
Other **	658	15.2	622.4	14	609.4	13.5	556	3.6	820 (293)	10.8
<b>TOTAL</b>	<b>4 318</b>	<b>100</b>	<b>4 435.1</b>	<b>100</b>	<b>4 533.1</b>	<b>100</b>	<b>4 213</b>	<b>100</b>	<b>7 596</b>	

\* This includes the subsidy for wheat and maize (both the local and imported).

\*\* This includes beans, lentil, rice, macaroni, tea, cooking butter which were decided to be subsidised starting from June 2004.

Source:

1. Ministry of Trade and Supply – unpublished data.
2. IDSC (Information & Decision Support Centre) (under the Egyptian Cabinet).

It is observed, furthermore, that due to the huge price increase for many food commodities in 2003-2004, the subsidies increased considerably as illustrated in the figures of Table 12. The table indicates the downward trend in subsidy allocations throughout the last few years and the sharp upward trend of the last year<sup>3</sup>.

**Table 12.12 - Share of government funds allocated to subsidies  
in total government expenditure (%)**

Year	Government spending  £E Million	Subsidies  £E million	%
1999/2000	101 834	4 318	4.2
2000/2001	109 069	4 435	4.1
2001/2002	113 626	4 533	3.9
2002/2003	124 909	4 213	3.4
2003/2004	152 000	7 596	5

Source:

1. National Bank of Egypt, The Economic Periodical, successive issues.
2. Ministry of Supply & Internal Trade (unpublished data).

<sup>3</sup> Wheat and flour have continued to increasingly account US\$ for the highest percentage of the subsidy allocations, amounting to approximately 79.3% in 2003/2004.



#### 12.3.4.3 – Production input subsidies

The government intervenes in the distribution of several basic production inputs – basically fertilisers and seeds – in order to guarantee their availability for producers at suitable prices and at a suitable time. The land productivity for these crops thus will not be affected. The government plays this role through the channels it controls such as the PBDAC and its branches in the different villages as well as the agricultural cooperatives. These authorities can thus provide the inputs at fixed prices (lower than the monopolistic prices which the private sector merchants try to impose) so as to avoid private sector monopoly. The purpose of the PBDAC and its branches is to distribute these basic production inputs and make them available at the right time and at a reasonable price.

This method has played a major role in the allocation of resources during the current farm year (2004/2005), and in guaranteeing the availability of fertilisers for the various agricultural crops for small producers, who hold the major part of the country's cultivated areas<sup>4</sup>.

In some years, input subsidisation policy also includes subsidisation of certain insecticides (especially for combating the epidemics affecting cotton) as well as the interest rates on the agricultural loans granted by the PBDAC in order to guarantee that these inputs are available to producers at an affordable price, even if the funds allocated to such forms of subsidy differ from one year to the next, or, in some cases, the allocations have even completely ceased for a number of years.

### **12.3.5 - Financing policy**

#### 12.3.5.1 - Sources of financing in Egyptian rural areas

The various sources of financing in Egyptian rural areas include:

- a) **Official fund sources (banking institutes):** these banking institutes are supervised by the Central Bank and include the commercial banks, the investment and business banks and the specialised banks. The most important of these is the PBDAC with its various branches in the different villages in rural Egypt.
- b) **Semi-official sources:** these are financing institutions created by virtue of a special law with the aim of achieving limited social and economic goals, such as

---

<sup>4</sup> In the present year (2004/2005), the amount of subsidies allocated to providing fertilisers for the agricultural sector has amounted to approximately 440 million £E (approx. US\$76 million), which has meant that fertilisers have been available to producers at a price not exceeding 60% of the price of their import. This amount of the subsidy was paid from the resources of the fund for stabilising fertiliser prices. Source: Al-Ahram – Economics, issue 1903 of 27.06.05.

the Social Fund for Development (SFD), the Local Development Fund, Cooperatives, NGOs, Insurance Funds, etc.

- c) **Unofficial sources:** these sources are not controlled by either the mechanisms, the monitoring or the supervision of the Central Bank. They include rural merchants, brokers, agricultural companies, usurers, relatives, charities, etc. It is pointed out in one study<sup>5</sup> in this context that the unofficial sources provide about 50% of the funds available in rural Egyptian.

The objectives of agricultural credit policy can be defined as follows:

1. To increase the volume of agricultural exports by providing credit for cultivation for export.
2. To improve the efficiency of agricultural resources management and increase agricultural production in general.
3. To raise the level of farmers' income, improve their financial situation and encourage them to save.
4. To provide suitable financing for small and micro projects and encourage rural producers to set up such projects.

The PBDAC is considered the main source for financing the agricultural sector in Egypt, since it provides all kinds of loans necessary for productive purposes. Since the launching of the liberation policies for the agricultural sector, the Bank has been applying basic commercial rules in its credit activities when dealing with client farmers. Furthermore, since the government is endeavouring to relieve the burdens on small producers and those who work on reclaiming desert land, it is continuing to subsidise interest rates on certain types of short-term loan as well as the loans intended for reclaiming and cultivating new land.

The Bank provides short and medium-term loans depending on the kind of activity for which the loan is contracted. The Bank services cover more than 11 investment activities in the agricultural sector as illustrated in Table 13.

---

<sup>5</sup> Sabaa & Sharma, M. Strengthening the Institution for providing Financial Services to the rural Households in Egypt. AERI – IFPRI, APRP Project, 1999.

**Table 12.13 - Loans granted by the P.B.D.A.C. for investing in various agricultural sectors \***

Purpose of loan	Value of loans depending on their term in £E million					
	1999/2000			2000/2001		
	Short	Medium	Long	Short	Medium	Long
Animal	2 766	1 112		2 966	1 174.6	
Poultry	151.1	134		138	120.9	
Fish	3.3	1.4		2.6	2.5	
Machinery		201			182	
Arable crop production		11			7.6	
Protected agriculture	11.3	11		108.5	8.4	
Land reclamation			1.7			1.2
Irrigation systems			5			3.8
Establishing orchards			0.8			0.1
Technical agricultural operations	2 389	681		2 496	747.5	
Youth	11	19		7.6	33.9	
Other						
Total	5 332	2 170	7.4	5 610.2	2 277.4	4.1

Purpose of loan	Value of loans depending on their term in £E million					
	2001/2002			2002/2003		
	Short	Medium	Long	Short	Medium	Long
Animal	3 354.4	1 271.5		3 169.8	1 078.6	
Poultry	143.6	126.8		123.7	113.4	
Fish	4.9	1.3		4.7	2.5	
Machinery		163			150.6	
Arable crop production		18.9			10	
Protected agriculture	8.1	7.1		5.9	2.5	
Land reclamation			1.1			0.75
Irrigation systems			2.4			3.8
Establishing orchards			1.6			2.8
Technical agricultural operations	3 002.2	771.9		2 734.4	708.3	
Youth		19.3		7.5	24.7	
Other				30.3	258.4	1.6
Total	6 513.2	2 381.2	5.3	6 076.3	2 348.9	8.9

**Table 12.13 (contd.)**

Purpose of loan	Index		
	1999/2000 = 100		
	Short	Medium	Long
<b>Animal</b>	114	97	
<b>Poultry</b>	81.8	84.5	
<b>Fish</b>	142.4	178	
<b>Machinery</b>		75	
<b>Arable crop production</b>		91	
<b>Protected agriculture</b>	52..2	22	
<b>Land Reclamation</b>			44
<b>Irrigation Systems</b>			76
<b>Establishing orchards</b>			350
<b>Technical agricultural operations</b>	114.4	104	
<b>Youth</b>	68	130	
<b>Other</b>			
<b>Total</b>	113.9	108	120

\*Source:

1. PBDAC.
2. CAPMAS Bulletin of Cooperative Activity in the Agri Sector.

### 12.3.5.2 - Guarantees and conditions for obtaining credit

The required guarantees depend on a variety of factors the most important of which are:

- 1- The purpose, term and size of the loan.
- 2- The feasibility study on the investment projects.
- 3- The availability of land tenure rights for agricultural lending. In this respect, in the owner-tenant relationship many tenants have lost the possibility of dealing with the bank because they have lost land ownership despite the fact that they have farmed the land. Guarantees thus differ from case to case. The terms of credit have improved remarkably for small farmers and the agricultural rural population.
  - a) *Agricultural credit guarantees for old lands:*
    - 1- Ownership of the farmland.
    - 2- The crop must have actually been sown, as vouched for in a report submitted by the agricultural inspector (i.e. a PBDAC official).
    - 3- There must be no other mortgage on the same land.

- 4- There must be no legal problems or litigations concerning the land for which the loan is contracted.

***b) Guarantees for the new lands (reclaimed land):***

- 1- No short-term seasonal agricultural loans are granted, but cash amounts are granted for agricultural production inputs (fertilisers) if it has been proved that the land has attained the marginal level of productivity.
- 2- For graduates who are beneficiaries of the land reclamation project, the Bank provides this service through the guarantee of the cooperative association within whose purview the land falls.
- 3- Some loans are granted for land on the basis of a mortgage, after the PBDAC survey, in addition to the guarantee of the cooperatives, once the PBDAC surveys of the land registered with the Land Registry Office have been approved.

***c) Investment credit guarantees:***

Loans are granted in return for guarantees such as:

- 1- Guarantee of the project's financial situation (as per financial statement) after examination of the loan applicant's five credit eligibility criteria: Reputation – Ability To Repay – Previous Experience – Guarantees – Sound financial position. If the required loan exceeds a certain limit, the mortgage of real estate is a further a condition.
- 2- Specialised associations provide 100% of the amount of the proposed loan provided that there are no liabilities on the mortgaged assets.
- 3- Loans for machines and equipment are granted in return for the mortgage of the assets (the ownership deeds).
- 4- Loans are granted amounting to up to 50%-60% of the project's value.
- 5- Investment loans are granted for animal production based on the mortgage of the farms and the farm's turnover record.
- 6- In the case of investment credit, small farmers are granted one (short-term investment) loan to buy one or more animals in return for guarantees and bank cheques.
- 7- Small farmers are granted investment loans in return for the mortgage or the security provided by a public employee guarantor (who enjoys a guaranteed government income) and to guarantee the bank cheques for periodical loan repayments for amounts between £E3000 and £E5000. In this respect, it is evident that all investment loans, even the smaller ones such as the livestock fattening loan, need the holding as a guarantee as well as the guarantee of a public employee's salary and uncrossed cheques signed by the borrower. None of these are available for small farmers, tenants, agricultural labourers, women breadwinners, or for the various other categories studied. The study therefore recommends that a more flexible solution be sought with regard to providing the guarantees needed for small investment loans.

## 12.3.5.3 - Interest rates on agricultural loans

**Table 12.14 - Changes in the interest rates for the major agricultural activities 1998/1999-2002/2003**

Years	Total agricultural loans million £E	Crop production loans*			Investment loans**		
		Interest rate %	Total loans million £E	%	Interest rate %	Total loans million £E	%
1998/1999	9 633.7	10	2 700.7	28.0	12-13	6 933	72
1999/2000	10 998.7	7.5	3 270.5	29.7	12-13	7 728	70.4
2000/2001	11 571.7	7.5	3 422.3	29.6	12-13	8 149	70.4
2001/2002	11 982.6	7.5	3 520.6	29.4	12-13	8 462	70.6
2002/2003	12 325.5	7.5	3 790.8	30.8	12-13	8 535	69.2

\* Crop husbandry loans include the loans granted for non-farm agricultural investment.

\*\* Investment loans include the loans granted for food security activities, agricultural machines and land reclamation. Such activities are carried out by large-scale farmers.

Source: PBDAC – Information Sector & Computer Resource Centre – Cairo 2004.

As indicated in Table 14, it is clear that the interest prices on the loans provided for crop farming (mostly to small farmers) are low due to the government subsidisation of these activities as of the 1999/2000 farm year. In this respect, the government pays the difference between the market interest rates and the rate at which such loans are granted. It is also observed that interest on loans for financing investment activities (charged mainly to large farmers) is high, since these loans are not subsidised. The table also shows that around 30% of the loans provided by the PBDAC are still subsidised and are intended for serving small farmers. At the present time, there is a tendency in the Bank's policy to link interest subsidisation to tenure status (leasehold or owner-operated farm).

## 12.3.5.4 - Conditions for obtaining credit

The conditions according to which loans are granted can be summarised as follows:

*a) Short-term loans for crop husbandry:*

The term of these loans does not exceed 14 months. The ceiling of the amount of any loan is 70% of the production cost of the target crop of the loan. The interest on these loans is not subsidised since the original loan is reimbursed along with the interest in one single repayment after harvesting.

*b) Short-term investment loans:*

These loans are provided to finance the operating costs of various investment activities. The term of the loans does not exceed 14 months, their value is 70% of the operating costs of the investment activity, and the interest rate amounted to approximately 12% (a commercial rate) in 1996 and continued at the same rate as

the rate charged by commercial banks the following years. The government occasionally intervenes to fix an interest rate lower than that fixed by the commercial banks so that producers can obtain their loans at low interest rates. In this case, the government compensates the PBDAC by the difference between the two rates. The loan term, grace period, and number and periodicity of instalments are determined according to the financial expectations for the target activity to be funded. The target activities concerned in this type of loan include animal breeding projects, poultry projects, apiaries, fishery projects, protected agriculture, trade in agricultural inputs and small, craft and environmental projects.

During the period under review, the amount of short-term loans increased for most activities except those in the fields of poultry and protected agriculture, which decreased as shown in Table 13. The increase in the total amount of short-term loans amounted to approx. 113.9% during the two-year period under review.

*c) Medium-term investment loans:*

The term of these loans is between 14 months and 5 years. They are provided to finance the establishment of agricultural and rural projects and other relevant activities such as poultry production projects, hatching laboratories, establishment or renewal of animal production projects, protected agriculture, permanent agriculture, milk preservation and refrigeration, the purchase of agricultural equipment and outfits, agricultural manufacturing projects, improvement of the quality of agricultural soil and improvement of the irrigation system in the Valley and Delta. The loan value differs according to the nature of each of these projects, as illustrated below:

<b>Project</b>	<b>Loan value</b>
Purchase of agricultural machines and equipment	85% of the value of the equipment
Means of transport	80% of the actual cost
Environmental, craft and vocational projects	70% of the actual cost

Furthermore, the interest rate on these loans is determined according to the current market interest rates at the time of contracting the loan. Moreover, grace periods and the number and periodicity of instalments are determined according to the cash flows of the target activity.

As shown in Table 13, apart from the loans provided for fishery activities and agricultural machinery, the value of medium-term loans has decreased for most activities, the lowest rate being reached in protected agriculture loans, about 22% less in the 2002/2003 farm year than in the 1999/2000 farm year. The increase in the total medium-term loan amount between these two farm years was approximately 108% due to the increase in the amount of these loans from 2.17 billion to approximately 2.4 billion in the period from 1999/2000 to 2002/2003.

*d) Long-term investment loans for reclaiming new land:*

The term of these loans is more than 5 years, while the value of each loan is determined as 50% of the actual cost of reclaiming new land with a maximum ranging from £E 1200 to £E2300 per feddan depending on the type of agricultural land and the irrigation source and system. These loans have been provided without any subsidy since the 1998/1999 farm year. A grace period of 5 years is granted, after which loans are reimbursed in annual payments according to the expected cash flows of the target project.

The amount of long-term loans for projects for establishing orchards has increased. In other words, the amount of the loans granted for this activity in the 2002/2003 farm year increased by 350% compared to the 1999/2000 farm year. As a result, the total value of this type of (long-term) loan amounted in the 2002/2003 farm year to approximately 120% of its value in the 1999/2000 farm year (see Table 13). This survey of lending policy in fact shows that the PBDAC's activity diminished in the case of many activities during the period under review. There was no increase whatsoever in the Bank's activity except in the field of animal production (short-term loans), fishery and technical agricultural operations (short and medium-term loans).

### **12.3.6 - Environment policy**

In the agro-environmental field the implementation of programmes designed as basic components of the Egyptian strategy for dealing with the environment in the agricultural sector continued. This is based on the conviction of policy makers and executives in both the agricultural and the environment sector that environmental protection is one of the fundamental pillars of sustainable development. In order to achieve this objective, a number of programmes are being adopted, the most important of which in the agricultural sector are:

1. Programme for monitoring the quality of Nile water.
2. Programme for developing afforestation and increasing green areas.
3. Programme for environmental protection and the management of nature reserves.

Furthermore, the Egyptian Ministry of Agriculture has adopted the Integrated Combat Programme, which includes action to develop new genetically epidemic-resistant species in all agricultural crops. Thus, many projects are currently being implemented for managing agricultural waste by transforming it into organic fertilisers or animal feed or using it (after treatment and processing) as raw material for numerous environmental industries.



## **12.4 - Production and agricultural income**

The Egyptian agricultural sector achieved favourable development during the period under review. There was an increase in productivity for most agricultural crops and products as the result of horizontal and vertical expansion efforts on the part of both the government and the private sector. This expansion and development was the outcome of a number of the policies mentioned above (see Appendices 10-15).

The figures in Table 15 indicate what the sector achieved in increasing agricultural income in the various fields (crop and animal husbandry, fisheries). Perhaps the stability of the value added figures for crop and animal production (which is the result of the high intermediate consumption figure) proves the fall in growth rate in 2002/2003 which was indicated in Table 4. The increase in income from the fishery sector made it possible to offset this fall.

The results of agricultural production activities illustrated in Appendices 10-15 reflect the positive changes in the self-sufficiency rates for most agricultural crops. The rate for crops and for animal and plant products has improved (with the exception of pulses, vegetables, fruit and fish), as illustrated in Table 16.

**Table 12.15 - Agricultural economic account, global results  
in million local currency**

Agricultural and livestock indicators	2001	2002		2003	
	Value current prices	Value current prices	Index	Value current prices	Index 2002= 100
<b>A- Final agricultural output</b>	68 747	84 260	100	90 142.8	107
Arable crop production	44 744	48 511	100	55 536.9	114.4
Animal production	24 003	29 556	100	34 605.9	117
<b>B- Intermediate consumption</b>	21 059.7	22 156	100	27 675.3	12.5
<b>C=A-B, Gross value added</b>	47 687.3	62 104	100	62 470.5	100
<b>D = Subsidies *</b>	161.4	2 21.3	100	2 25.4	101
<b>E= Taxes*</b>	145.4	1 35.2	100	1 45.4	110
<b>F= C+D-E, Gross value added at factor costs</b>	47 7 03.3	62 1 90.1	100	62 550.5	100
<b>G = Depreciation</b>	59.3	62.2	100	63.9	
<b>H = F-G, Net value added at factor costs = Agricultural income</b>	47 644	62 138	100	62 386.6	100
Fisheries	2001	2002		2003	
	Value current prices	Value current prices	Index	Value current prices	Index
<b>A- Final Agricultural output</b>	5 993	6 188.3	100	6 710.1	108
<b>B- Intermediate consumption</b>	103.3	110.2	100	114.8	108
<b>C=A-B, Gross value added</b>	5 889.7	6 078.1	100	6 595.3	108
<b>D = Subsidies**</b>	-	-	100	-	
<b>E= Taxes**</b>	-	-	100	-	
<b>F= C+D-E, Gross value added at factor costs</b>	5 889.7	6 078	100	6 595.3	18
<b>G = Depreciation</b>	402.2	439	100	501.9	112
<b>H= F- G, Net value added at factor costs = Agricultural income</b>	5 487.5	5 639.1	100	6 093.4	108

\*\* Since there are no available data on subsidy, tax and annual depreciation, these assumptions were developed by myself based on the rate of the previous year.

\* As for the fishery sector, there is no published data regarding these items.

Sources:

1. Ministry of Agriculture and Land Reclamation, Economic Affairs Sector, Income Estimations Periodical, various issues.
2. Ministry of Agriculture and Land Reclamation, The General Authority for Agricultural Budget Fund, unpublished data.
3. Ministry of Finance, Real Estate Tax Authority, Resource Centre, unpublished data.

**Table 12.16 - The percentage of self-sufficiency for the major food items**

Item	Years			Index
	1996-2000	2002	2003 *	2002=100
	<b>% of self-sufficiency</b>			
<b>Wheat (and flour)</b>	95.8	54.3	62.9	116
<b>Maize (white and yellow)</b>	63.5	55.8	60.6	109
<b>Rice</b>	105.7	108.5	110.4	102
<b>Potatoes</b>	112	109.6	112.5	103
<b>Pulses</b>	73.8	56.3	53.2 (-)	94
<b>Vegetables</b>	101.3	102.7	102.6 (-)	100
<b>Fruit</b>	100.7	104.1	102.2 (-)	98
<b>Sugar</b>	64.9	75.8	84.1	111
<b>Oil</b>	30.6	38.8	47.3	122
<b>Red meat (beef and buffalo)</b>	70.7	81.3	86.2	106
<b>Poultry</b>	100	99.6	100	100
<b>Fish</b>	73	83.5	82.8 (-)	99
<b>Fresh eggs</b>	100	100	100.5	100
<b>Dairy products</b>	76.4	79	83.1	105

\* A recent study anticipates the decrease of the self-sufficiency rate of wheat, flour, sugar, red meat, fish and dairy products to 50%, 50%, 72%, 75%, 80%, 80% respectively in 2004<sup>6</sup>.

Source: Arab Agricultural Organisation – Yearbook of Agricultural Statistics 2004 (see Appendix 7, 8 & 9).

## **12.5 - Agricultural foreign trade**

### **12.5.1 - External relations policies**

Exports in general, and agricultural exports in particular, are considered one of the most important fundamentals of Egyptian economic policy. They are perceived as an “engine for development” the revival of which will result in success in addressing various economic and social problems such as the balance of trade deficit, unemployment, and the modernisation of the domestic economy.

The government has thus continued to exert efforts at all legislative, administrative and technological levels with the ultimate goal of removing all obstacles to the annual expansion and increase of the value of exports. This would definitely require overcoming all bureaucratic obstacles and legislative complexities and providing

<sup>6</sup> Nassar, Saad (phd), The 2<sup>nd</sup> Egypt Human Development Report 2005 – Workshop EHDR 2005: vision for Egypt in the year 2005 – Agriculture, 2017. Cairo, June 2005.

incentives for promoting product quality and improving agricultural yields intended for export.

The major developments observed in this field are as follows:

- The government has continued to pass a number of laws and to reform existing legislation concerning the obtaining of approval or permits, fees or taxes, shipping or transport, insurance or financing, etc, in order to create an appropriate legislative environment for expanding exports.
- Two new laws have been passed on customs duties and taxes. These laws introduce numerous simplifications and rules which aim to facilitate the flow of foreign trade in general.
- In the context of the measures to develop the institutional environment of the export sector, a separate ministry has been established for foreign trade and is related to the industrial sector in that it will be responsible for all tasks relating to exports.  
Both the AFTA (Arab Free Trade Area) Agreement and the QIZ (Qualified Industrial Zone) Agreement have entered into effect as of the beginning of 2005. Furthermore, interest in linking export policies to the requirements of international markets has emerged. This was evident in the efforts exerted to comply with the international quality systems established by the European Union and the World Trade Organisation such as the Codex, the EuroGAP, the Hasp (Health And Safety Plan), which are, for instance, the marks of compliance and conformity, as well as the requirements of food quality laid down by the European Union (EU). These are a set of arrangements and technical and administrative systems that aim to achieve healthy and high quality products which meet the quality standards set on export markets.
- The government is continuing to pursue efforts to open new markets for Egyptian agricultural exports and to take full advantage of the shares allocated to Egyptian agricultural exports in agreements concluded with other countries and economic coalitions.

#### ***12.5.2 – Developments in the export and import of agricultural commodities***

As a result of these efforts the volume of agricultural exports has increased in the past few years, reaching unprecedented figures. This development in export volume in the period from 2001 to 2004 is shown in Table 17, the increase being particularly marked in 2004, when a figure some 41% higher than the figure for the previous year was registered.

**Table 12.17 - Total and agri-exports and imports in million US\$\***

Year	Exports			Imports		
	Total	Agricultural	%	Total	Agricultural	%
<b>2001</b>	4 123	529	12.8	12 639	1 784	14.1
<b>2002</b>	4 698	660	14.1	12 524	2 004	16
<b>2003</b>	6 147	776	12.6	10 927	1 566	13.4
<b>2004</b>	7 650	1 095	14.3	12 859	1 579	12.3

\* The sections do not include either the trade of free zones with foreign countries or trading through the special customs system.

Source: Ministry of Foreign Trade & Industry – accumulated report on Foreign Trade – Vol. 4 – issue 9, January 2005).

**Table 12.18 - Total and agricultural balance of trade**

	Total	Agricultural	%	Index 2001=100	
				Total	Agricultural
<b>2001</b>	- 8516	1255	14.7	100	100
<b>2002</b>	- 7835	1344	17.2	92	107
<b>2003</b>	- 4780	632	13.2	56	50
<b>2004</b>	- 5209	485	9.3	61	38.6

Source: *ibid.*

As a result, the agricultural deficit dropped sharply to reach a level 38.6% lower than in 2001. Furthermore, the share of agricultural exports in total exports continued to increase from 12.6% to 14.3%.

Meanwhile, total imports continued to decline as did agricultural imports, with only a slight increase in 2004 compared to the previous year. Despite this, the share of agricultural imports in total imports decreased continuously due to the constant increase in total imports, and in particular to the leap in total imports in the last year. The result was that the figure recorded for the total deficit in 2004 increased from 56% to 61% after dropping the previous year from 92% to 56%.

**Table 12.19 - Geographical distribution of exports**  
(value in million US\$)

	US		European Union		Arab countries	
	Value	%	Value	%	Value	%
Cotton, raw	42	8.8	79	16.4	-	
Vegetables	1		113	58.2	51	26.3
Cereals	-		13	5.6	119	51.3
Fruit	-		34	53.2	22	34.4
Meat	1	2.4	2	4.8	36	88
Edible oil	-		2	9	20	91
Sugar	-		26	43.4	18	30
<b>Total</b>	<b>44</b>	<b>4.1</b>	<b>269</b>	<b>24.5</b>	<b>266</b>	<b>24.3</b>

	Asian countries		Others		Total	
	Value	%	Value	%	Value	%
Cotton raw	334	69.2	27	5.6	482	100
Vegetables	7	3.6	22	11.3	194	100
Cereals	50	21.6	50	21.6	232	100
Fruit	4	6.2	4	6.2	64	100
Meat	1	2.4	1	2.4	41	100
Edible oil	-		-	-	22	100
Sugar	8	13.3	8	13.3	60	100
<b>Total</b>	<b>404</b>	<b>36.9</b>	<b>112</b>	<b>10.2</b>	<b>1095</b>	<b>100</b>

Source: CAPMAS – ibid.

**Table 12.20 - Geographical distribution of imports**  
(value in million US\$)\*

	USA		European Union		Arab countries	
	Value	%	Value	%	Value	%
Cereals	623	57.3	78	7.2	44	4
Meat	11	2.6	126	29.3	17	3.9
Edible oil	9	2.5	21	5.8		
Sugar	-	-	4	6	1	1.5
<b>Total</b>	<b>643</b>	<b>33</b>	<b>229</b>	<b>11.8</b>	<b>62</b>	<b>3.2</b>

	Asian countries		Others		Total	
	Value	%	Value	%	Value	%
Cereals	-	-	343	31.2	1088	<b>100</b>
Meat	-	-	276	64.2	430	100
Edible oil	219	60.5	113	31.2	362	100
Sugar	1	1.5	61	91	67	100
<b>Total</b>	<b>220</b>	<b>11.3</b>	<b>793</b>	<b>40.7</b>	<b>1947</b>	<b>100</b>

\* The sections include both the amounts imported in the free zone systems and the dismantling of customs tariffs (special customs system).

Source:

1. CAPMAS.
2. <http://192.1.1.253:7777/pls/trade/trfo> (in 11.06.05).

All of this resulted in a steady decrease in the share of the deficit in the agricultural balance in the total deficit during the last year, when it reached its lowest rate of 9.3% as illustrated in Table 17.

Perhaps the positive developments in export policy, which were pointed out at the beginning of the present section, were behind such a favourable development in the balance of trade and the agricultural balance.

As regards the geographical distribution of exports to the major regional groups<sup>7</sup>, when one studies the data in Table 19, it is evident that the group of Asian countries ranks first as the destination of Egyptian exports. This is due to the increase in their imports of Egyptian cotton and rice. They are followed by the European Union countries due to the increase in their imports of vegetables and fruit as the result of the implementation of the partnership agreement between Egypt and the countries of this group. Then come the Arab countries, which import more than 50% of Egyptian rice exports. Furthermore, there is the group of "Other countries", whose share of Egyptian rice exports has increased to more than 21.6% and of Egyptian vegetable exports to 11.3%. In this respect, it is generally considered that the markets of the group of Eastern European countries are the traditional markets for Egyptian fruit and vegetables. Finally, the US ranks at the bottom of the list, concentrating on importing a limited amount of Egyptian raw cotton.

As regards the geographical distribution of imports for the same group of economic coalitions, which is illustrated in Table 20, it is evident that the largest exporter to Egypt is the "Other countries" group, especially in the case of the two commodities of sugar (91%) and meat (64%). Furthermore, this group of countries accounts for about one-third of Egyptian imports of cereals and edible oil. They are followed by the US, which ranks second in the list of exporters to Egypt with a remarkable share of 57% of cereals in particular (wheat and maize). Then come the European Union countries, which account for a considerable share of meat imports (some 29.5%), and the Asian countries, which also account for a significant share of edible oil imports (some 60.3%). And finally, the Arab countries occupy the last position in the list of exporters to Egypt according to the statistics for 2004.

### ***12.5.3 -The degree to which Egypt takes advantage of the quotas allocated for Egyptian exports to the EU***

When one examines the data in Table 21, one notes that Egypt still takes limited advantage of this agreement although many years have passed since it began to be

---

<sup>7</sup> The US, the countries of the European Union, the Arab countries, the non-Arab Asian countries, as well as to the other groups of countries, which include African countries with their new economic coalitions (in which Egypt is a member) - such as the COMESSA (North African countries) - and Latin America (with which Egypt has recently established strong economic ties) as well as the non-EU European countries - mainly the countries of Eastern Europe (it is well known that historically they have had good economic relations with Egypt throughout the previous decades prior to the collapse of the socialist regimes).

implemented. The percentage of Egypt's use of the quotas granted for its exports to the markets of these countries still does not exceed 69% for potatoes, 82% for citrus, 56% for frozen and canned vegetables, 9% for onions, 20% for garlic and 18% for dried vegetables. Meanwhile, Egypt's trade with the countries of other economic groups has developed favourably, in spite of the absence of partnership agreements. These results show that it is important to review the terms of the agreement. This phenomenon should also be taken into consideration whenever the list of commodities is periodically revised. This should pave the way for more extensive possibilities for Egyptian exports by removing the barriers which are repeatedly added to the terms determined by the Union countries for the agricultural commodities and products entering their markets. At the same time, considerable effort should be made at production level and in the export sectors so that the competitiveness of Egyptian commodities on the markets of these countries can be improved.

**Table 12.21 - Percentage of use of the quotas for agricultural exports to the EU**

Item	Export period	Share (ton)	Usage (ton)	Percentage (%)
Early potatoes	1/1/2005 – 31/3/2005	190 000	131 603	69
Fresh citrus	1/7/2004 – 30/6/2005	63 020	51 744	82
Fresh and dried onions	1/1/2005 – 15/6/2005	16 634.5	1 499.8	9
Lettuce	1/11/2004 – 31/3/2005	515	515	100
Fresh garlic	1/2/2005 – 15/6/2005	3 090	603	20
Cucumber	1/1/2005 – 28/2/2005	515	94.4	18.3
Frozen and canned vegetables	1/1/2005 – 31/12/2005	2 000	1 122	56
Dried beans	1/1/2005 – 31/12/2005	17 046.7	3 071.7	18
Fresh strawberries	1/10/2004 – 31/3/2005	1 205	1 188	98.5

Source: Consolidated Report on Foreign Trade – *ibid.*

## 12.6 - Food Consumption

The data in Table 22 indicate a slight improvement in the Egyptian pattern of food consumption in the last year. In other words, average per capita consumption has increased for both vegetables, fruits, red meat (beef and buffalo) and dairy products. When one considers that these food items are responsible for building the body and generating energy, the increase in the per capita share of the consumption of such major nutritional components is considered a positive indicator of the improvement in the diet of the Egyptian population, even if the effect of this increase is diminished by the decrease in the average per capita share of sugar, oil and poultrymeat. This improvement is demonstrated by the steady



downward trend in the per capita share of cereals, potatoes and pulses, all of which contain a large amount of starch, which causes weight gain.

**Table 12.22 - Per capita food consumption (2002/2003) in kg**

Items		2002 (population: 67.3 million)	2003 (population: 68.6 million)	Index 2002=100
1.	Wheat (and flour)	181.3	158.5	87.4
2.	Maize (white and yellow)	159	150	94.3
3.	Rice	83.6	81.5	97.5
4.	Potatoes	26.9	26.4	98.1
5.	Pulses	13	11.6	89.2
6.	Vegetables	208.3	219.9	1.06
7.	Fruit	114.1	112.4	98.5
8.	Sugar	27.5	24.3	88.4
9.	Oil	10.2	7.7	75.5
10.	Red meat (beef & buffalo)	11.1	13.2	119
11.	Poultry	16.1	12.1	75.1
12.	Fish	13.7	13.5	98.5
13.	Fresh eggs	5.2	5.1	98
14.	Dairy products	76.8	90.3	117.6

The same study by Nassar Saad (ibid) points to an anticipated decrease in the per capita share of food products in 2004. However, the per capita share of sugar, fish and dairy products is also expected to improve.

Sources:

1. CAPMAS – Department of Statistics – published in the *Al-Ahram* newspaper on June 23, 2004.
2. Ministry of Agriculture and Land Reclamation - Agriculture & Economic Department, Food Balance Sheet.
3. Arab Agricultural Organisation – Yearbook of Agricultural Statistics 2004 (see Appendix 7, 8 & 9).

## 12.7 - Agricultural and food industries (AFI)

The share of the government sector in the food industries continued to decrease during the period from 2000-2001 to 2002-2003, when there was a relative decrease in the number of units connected with that sector as well as in the value of their production due to the annual increase in the share of the private sector. This is basically the result of the privatisation programme which has been implemented for the past few years and which aims to do away with the increasing number of government sector units as well as to cease to provide new investments for that sector.

As illustrated in Table 23, the relative importance of the value of production of the government and public sector units dropped from 52.4% in 2000/2001 to 44% in 2002/2003, whereas the relative contribution of the volume of production of the private sector increased from 47.6% to 56% in the same period. Despite the decrease in the number of private sector units during that period, the rate of decrease involving both sectors (private and public) was higher for the units of the government and public sector, reaching about 16%, whereas it did not exceed 8% for the units in the private sector.

**Table 12.23 - Development of food industries in the private and public sector  
(quantity-units) – (value-£E Million)**

	2000/2001			2001/2002		
	No. of units	Production value	% of production value	No. of units	Production value	% of production value
Government and public sector	30	12 244	52.4	28	13 109	51.4
Private sector	861	11 107	47.6	683	12 368	48.6
Total	891	23 351	100	711	25 477	100

	2002/2003		
	No. of units	Production value	% of production value
Government and public sector	25	12 737	44
Private sector	792	16 214	56
Total	817	28 951	100

Source: CAPMAS – Yearbook, successive issues.

The data in Table 24 show the steady decrease in the relative importance of the various indicators of the agricultural industry within the total industrial activity of the public sector throughout the period under review. In other words, the

employment rate and the number of workers and their contribution to output and added value have constantly decreased. Investments allocated to AFIs did not exceed 5.5% during the last year under review.

**Table 12.24 - Main indicators of the agro-food industries (AFI), in the public business sector 2001/2002 – 2002/2003**

Indicators	Units	2001/2002			2002/2003		
		Total industries	AFI	%	Total industries	AFI	%
Employment	Workers	398 000	50 785	12.8	371 190	47 856	12.8
Production	£E million	38 292	5 564	14.5	43 404	6 004	13.8
Value added	£E million	11 602	989	8.5	14 055	1 049	7.4
Salaries	£E million	5 016	454	9	5 149	459	8.9
Investment	No. of enterprises	672	285	42.4	42 944	2 370	5.5

Source: CAPMAS - Annual Industrial Production statistics – Public Business Sector – successive issues.

Furthermore, it is evident from Table 17 in the Appendix that the milling, baking, dairy and oil industries are considered the major activities with the largest share in the public sector of the agro-food industries. The data on the development of the major indicators (denoting the activities of these industries) point to a decline in the number of units and workers. At the same time, they indicate an increase in production value and added value. Perhaps this could be interpreted to mean that although the privatisation programme aims to do away with such units, albeit in the medium term (it is claimed that they are unable to achieve competitive profits), workers and managers are endeavouring to prove otherwise.

## ***Appendices***

### **Appendix (1) - Equivalent rates for measurement units**

1 Hektar	2.38 Feddan
1 Ardeb (wheat)	150 Kg
1 Ardeb (white maize)	140 kg
1 Ardeb (Beans)	155 kg
1 kintar (cotton)	157.5 kg
1 Ardeb (Peanuts)	75 kg
1 Ardeb (sesame)	120 kg

**Appendix (2) - Value of agri production, value in million L.E.,  
2001-2003**

<b>Value of Vegetal Production</b>			
<b>Item</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>
Cereal	12328	13591.2	16647
Legume	775	793.2	711
Fibers	2021.7	2062.1	2105.03
Oil	608.2	609.5	683.7
Sugar	1949.4	2110.4	2011.2
Onion	347.8	413.6	400.8
Green Fodders	7730.4	8588.9	9489.9
Other	1791.4	2044.6	37.8
Vegetables*	7629.1	8269.9	9687.8
Fruits**	9127.2	9594.2	10962.4
Aromatic and Medical	435.3	433.4	512.2
Total of Vegetal Product	44744	48511	55536.9

<b>Value of Livestock Production</b>			
<b>Item</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>
<b>Animal Production</b>			
Livestock meat	9060.8	11406.8	12424.9
Poultry meat	44579	6266.1	6403.6
Milk	6384.9	7035.1	9488.4
Table eggs	1347	1922.7	2077.9
Beehoney & wax	96.9	89.6	99.7
Manur	2541	2701.2	3879.7
Total	27003	29556	34605.9

<b>Value of Fish Production</b>			
<b>Item</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>
Mediterranean, Red Sea and Lakes	3244.8	2497.9	3242.7
Aquaculture	21749	2889.6	3467.4
Total	5993.5	6188.3	6710.1

\* The value of vegetal seeds is 123952 thousand L.E.

\*\* Including the value of fruit seedlings and carved wood seedlings which is 13542 thousand L.E.

Source:

1- Ministry of Agriculture & Land Reclamation - Economic Affairs Sectors (Eas).

2- National Agriculture Income for year 2003 - Cairo 2003.

**Appendix (3) - Evaluation of animal production 2001-2002**

Meat	Slaughters (1000 TON)	
	2001	2002
Beef	1960	2199
Sheep	2063	2295
Goat	2266	2331
Pork	64	68
Horse	—	—
Poultry	607844	714759
Rabbit	31873	33331
Other	33	—
Total	—	—
	Production (1000 TON)	
	2001	2002
Milk	—	—
Cow Milk	3831	1997
Sheep Milk	—	—
Goat Milk	123	126
Other	—	—
Eggs	271	398
Other	—	—

**Appendix (4) - Data of fisheries 2001-2002**

	2001	2002	2003	Index 2002=100
Fleets (number of fishig vessels) 1000	45	46.3	44.2	95.5
Production value L.E. Million	5993	6188	6710	108.4
Production 1000 Ton	772	801.5	876	109.3
Employment (number) 1000	56	53.9	52.6	97.6
Aquaculture (quantities) 1000 Ton	324.5	376.1	—	—
Fish Farming (quantities) 1000 Ton	18.3	359.1	427.9	119.2
Consumption (quantities, value)	—	919.7	927.8	101
Import 1000 Ton	26.1	154.4	163	105.6

\* Only 3954 out of this number are mechanical, the rest are manual.

Source:

CAPMAS - Fish Production Bulletin in A.R.E.

Various Issues Till Jan 2005.

### Appendix (5) - Farm gate prices 2001-2003

	Unit	Price -----Local Currency/T		
		2001	2002	2003
Soft Wheat	Ardeb	105	107.7	114
Barley	Ardeb	83.9	86.6	90
Maize	Ardeb	85.8	88	97
Rice	Ton	592.4	671.9	992
Potato	Ton	502	508.4	505
Sugar beet	Ton	110	110	110
Sunflower	Ton	900	1150	1730
Fourrage	Ton	—	—	—
Lettuce	Ton	—	—	—
Watermelons	Ton	556.8	779.9	441
Melona	Ton	663	670	—
Tomatotes	Ton	387	401.4	458
Pepper	Ton	628.6	460.2	435
Onion	Ton	252.6	251.5	230
Oranges	Ton	510.5	756.3	—
Mandarins	Ton	453.1	779.8	—
Lemons	Ton	782	657.9	—
Apples	Ton	1584	1346	—
Pears	Ton	2011	1954	—
Peaches	Ton	1426	1435	—
Apricots	Ton	1752	1459	—
Almonds	Ton	—	—	—
Bananas	Ton	1272.5	1296.7	—
Grapes	Ton	1355.5	1210.8	—
Wine	Ton	—	—	—
Table olives	Ton	—	—	—
Olive oil	Ton	—	—	—
other	Ton	—	—	—
meat	Ton	—	—	—
beef	Ton	12423.5	13735.3	1500
Sheep	Ton	13910	14823.3	—
Goat	Ton	13953.7	14825.3	—
Pork	Ton	12210	13096.3	—
Horse	Ton	—	—	—
Poultry	Ton	5164	4669	6100
Rabbit	Ton	8678.8	9083.5	—
other	Ton	—	—	—
Milk	Ton	—	—	920
Cow Milk	Ton	1482	1553.9	—
Sheep Milk	Ton	—	—	—
Goat Milk	Ton	1288	1356.4	—
Other	Ton	—	—	—
Eggs	Ton	3935.2	4830.9	5220
Other	Ton	—	—	—

Agricultural Price = Value of Total Production / Production

Source: 1- Ministry of Agriculture & Land Reclamation - Economic Affairs Sectors (Eas).  
 2- National Agriculture Income for year 2003 - Cairo 2003.

## Appendix (6) - Value of main inputs 2001/2003

Plant Production Inputs	Unit E.L.	Price -----LC/T		
		2001	2002	2003
Field Crops, seeds		1048.9	1144.8	1312.2
Vegetable Crops, seeds		496	533.5	686.4
Med & Aromatic crops, seeds		5.5	5.6	5.7
Fruit nursery plants		14	14.7	14
Total of Seeds, nursery plants		1564.4	1698.6	2017.9
N-Fertilizers		1364	1329.1	1728.1
P-Fertilizers		309.4	549.1	431.4
K-Fertilizers		83.5	127.9	79.8
Total of Chemical Fertilizers		1757	2006.1	2239.3
Manure		2541	2701.3	2239.3
Fuel, oil, grease		185	197.1	201.7
Depreciation		59.3	62.3	63.9
T. of Fuel depreciation		244.4	259.4	265.6
T. of pesticides		273.3	288.4	293.1
Total of Plant Prolud inputs *		5596.1	6258.6	8695.6
<b>Animal Production Inputs</b>		<b>2001</b>	<b>2002</b>	<b>2003</b>
Green Jodder			8588.9	9489.9
Berseem		7284	8089.5	8715.6
Egyptin clover		222	247.5	327.2
Other fodder		7730.4	251.9	447.1
<b>Total</b>		<b>15236</b>	<b>17117</b>	<b>18980</b>
Processed feeds		1252.7	1230	2160.8
Concentrates feeds		3763.3	4574.7	4894.1
Straws		1062.7	1262.1	1762.1
Eggs for hatcheries		457.9	606.4	687.9
Total		14267	16262	18994.4
<b>Fish Producton Inputs</b>		<b>2001</b>	<b>2002</b>	<b>2003</b>
Fish meat		4.2	4.3	4.7
Fingerlings		79.2	90.9	97.8
Fuel, oil greases for fishing gears		9.9	11.1	12.3
Depreciation & maintenance for F. gears		402.3	449.3	501.9
Total fish production inputs		505.6	555.7	616.8

\*Without rent which is estimated by E L 1200 annually, and it should be added to the producer who is not a land owner.

Source:

1- Ministry of Agriculture & Land Reclamation - Economic Affairs Sectors (Eas).

2- National Agriculture Income for year 2003 - Cairo 2003.



### Appendix (7) – Food balance sheets for major commodity groups Egypt, average 1996-2000

Value (V) : million U.S. dollars ; Quantity (Q.) : 1000 M.T ; S.S.R: Self-Sufficiency Rate

ITEM	S.S.R. %	AVAILABLE FOR CONSUMPTION	BALANCE	
			V.	Q.
<b>CEREALS (TOTAL)</b>	68.97	27028	1238.74	8386.48
WHEAT AND FLOUR	95.82	6384.62	843.13	266.95
MAIZE	63.48	9424.79	473.29	3441.58
RICE	105.67	5048.39	-89.2	-286.26
BARLEY	91.31	132.92	1.62	11.55
<b>POTATOES</b>	112.03	1780.86	-24.89	-214.22
<b>PULSES (TOTAL)</b>	73.82	629.22	93.39	164.7
<b>VEGETABLES (TOTAL)</b>	101.33	12840.46	-33.74	-171.21
<b>FRUITS (TOTAL)</b>	100.74	6594.38	6.6	-48.97
<b>SUGAR (REFINED)</b>	64.89	1848.37	194.01	649.04
<b>FATS &amp; OILS (TOTAL)</b>	30.64	741.18	370.59	514.09
<b>MEAT (TOTAL)</b>	84.77	987.79	228.85	150.42
RED MEAT	70.68	514.03	229.77	150.72
POULTRY MEAT	100.06	473.76	-0.92	-0.3
<b>FISH</b>	73.12	767.97	120.72	206.45
<b>EGGS</b>	100.05	166.72	-0.02	-0.09
<b>MILK &amp; DAIRY PROD.</b>	76.39	4339.46	170.77	1024.68
<b>TOTAL</b>			<b>2365.02</b>	

ITEM	IMPORTS		EXPORTS		PRODUCTION
	V.	Q.	V.	Q.	
<b>CEREALS (TOTAL)</b>	1343.45	8683.43	104.71	296.95	18641.52
WHEAT AND FLOUR	844.66	274.34	1.53	7.39	6117.67
MAIZE	473.54	3442.22	0.25	0.64	5983.21
RICE	1.22	1.81	90.42	288.07	5334.65
BARLEY	1.62	11.56	(..)	0.01	121.37
<b>POTATOES</b>	23.41	43.29	48.3	257.51	1995.08
<b>PULSES (TOTAL)</b>	102.47	180.38	9.08	15.68	464.52
<b>VEGETABLES (TOTAL)</b>	0.89	1.4	34.63	172.61	13011.67
<b>FRUITS (TOTAL)</b>	39.05	60.09	32.45	109.06	6643.35
<b>SUGAR (REFINED)</b>	194.47	652.57	0.46	3.53	1199.33
<b>FATS &amp; OILS (TOTAL)</b>	389.24	533.92	18.65	19.83	227.09
<b>MEAT (TOTAL)</b>	231.04	151.47	2.19	1.05	837.37
RED MEAT	230.89	151.43	1.12	0.71	363.31
POULTRY MEAT	0.15	0.04	1.07	0.34	474.06
<b>FISH</b>	122.28	207.32	1.56	0.87	561.52
<b>EGGS</b>	0.02	0.02	0.04	0.11	166.81
<b>MILK &amp; DAIRY PROD.</b>	177.57	1055.68	6.8	31	3314.78
<b>TOTAL</b>	<b>2623.89</b>		<b>258.87</b>		

Source: Arab Organization for Agricultural Development, Annual Agricultural Statistics Book 2004, Khartum – Sudan.

### Appendix (8) – Food balance sheets for major commodity groups Egypt, 2002

Value (V) : million U.S. dollars ; Quantity (Q.) : 1000 M.T ; S.S.R: Self-Sufficiency Rate

ITEM	S.S.R. %	AVAILABLE FOR CONSUMPTION	BALANCE	
			V.	Q.
<b>CEREALS (TOTAL)</b>	67.09	30056.18	1302.76	9891.85
WHEAT AND FLOUR	54.3	12200.71	815.81	5575.84
MAIZE	55.89	10699.75	582.5	4719.96
RICE	108.51	5626.77	-104.62	-478.69
BARLEY	90.27	111.66	1.07	10.86
<b>POTATOES</b>	109.6	1811.4	-12.51	-173.92
<b>PULSES (TOTAL)</b>	56.26	873.16	146.38	381.88
<b>VEGETABLES (TOTAL)</b>	102.71	14017.43	-74.6	-379.35
<b>FRUITS (TOTAL)</b>	104.1	7677.32	15.53	-314.44
<b>SUGAR (REFINED)</b>	75.81	1850.77	98.4	447.77
<b>FATS &amp; OILS (TOTAL)</b>	38.76	687.97	265.52	421.3
<b>MEAT (TOTAL)</b>	92.1	1831.78	236.07	144.64
RED MEAT	81.27	747.02	229.26	139.88
POULTRY MEAT	99.56	1084.76	6.81	4.76
<b>FISH</b>	83.49	919.72	91.44	151.82
<b>EGGS</b>	100.17	352.31	-2.24	-0.59
<b>MILK &amp; DAIRY PROD.</b>	79	5169.43	136.43	1085.43
<b>TOTAL</b>			<b>2203</b>	

ITEM	IMPORTS		EXPORTS		PRODUCTION
	V.	Q.	V.	Q.	
<b>CEREALS (TOTAL)</b>	1410.5	10384.11	107.74	492.26	20164.33
WHEAT AND FLOUR	817.81	5586.86	2	11.02	6624.87
MAIZE	582.68	4720.57	0.18	0.61	5979.79
RICE	0.82	1.4	105.44	480.09	6105.46
BARLEY	1.07	10.86	-	-	100.8
<b>POTATOES</b>	30.06	55.46	42.57	229.38	1985.32
<b>PULSES (TOTAL)</b>	159.73	412.98	13.35	31.1	491.28
<b>VEGETABLES (TOTAL)</b>	4.4	7.92	79	387.27	14396.78
<b>FRUITS (TOTAL)</b>	64.57	79.42	49.04	393.86	7991.76
<b>SUGAR (REFINED)</b>	105.5	466.6	7.1	18.83	1403
<b>FATS &amp; OILS (TOTAL)</b>	284.14	449.48	18.62	28.18	266.67
<b>MEAT (TOTAL)</b>	237.79	145.68	1.72	1.04	1687.14
RED MEAT	229.92	140.32	0.66	0.44	607.14
POULTRY MEAT	7.87	5.36	1.06	0.6	1080
<b>FISH</b>	93.61	154.35	2.17	2.53	767.9
<b>EGGS</b>	-	-	2.24	0.59	352.9
<b>MILK &amp; DAIRY PROD.</b>	145.71	1114.84	9.28	29.41	4084
<b>TOTAL</b>	<b>2536</b>		<b>333</b>		

Source: Arab Organization for Agricultural Development, Annual Agricultural Statistics Book 2004, Khartoum – Sudan.

### Appendix (9) – Food balance sheets for major commodity groups Egypt, 2003

Value (V) : million U.S. dollars ; Quantity (Q.) : 1000 M.T ; S.S.R: Self-Sufficiency Rate

ITEM	S.S.R. %	AVAILABLE FOR CONSUMPTION	BALANCE	
			V.	Q.
<b>CEREALS (TOTAL)</b>	73.11	28246.93	969.62	7595
WHEAT AND FLOUR	62.94	10875.2	575.64	4030.51
MAIZE	60.61	10286.56	528.34	4051.63
RICE	110.44	5592.5	-142.46	-583.77
BARLEY	99.47	142.21	0.09	0.76
<b>POTATOES</b>	112.51	1812.54	-1.9	-226.81
<b>PULSES (TOTAL)</b>	53.23	795.72	107.46	372.12
<b>VEGETABLES (TOTAL)</b>	102.58	15088.82	-76.14	-388.55
<b>FRUITS (TOTAL)</b>	102.16	7708.85	-22.48	-166.81
<b>SUGAR (REFINED)</b>	84.12	1667.94	47.16	264.94
<b>FATS &amp; OILS (TOTAL)</b>	47.33	527.59	170.55	277.87
<b>MEAT (TOTAL)</b>	92.82	1736.69	176.09	124.63
RED MEAT	86.21	908.34	176.99	125.28
POULTRY MEAT	100.08	828.35	-0.9	-0.65
<b>FISH</b>	82.77	927.78	83.95	159.88
<b>EGGS</b>	100.53	349.9	-8.17	-1.85
<b>MILK &amp; DAIRY PROD.</b>	83.12	6193.58	111.28	1045.58
<b>TOTAL</b>			<b>1557.42</b>	

ITEM	IMPORTS		EXPORTS		PRODUCTION
	V.	Q.	V.	Q.	
<b>CEREALS (TOTAL)</b>	1118.54	8182.45	148.92	587.45	20651.93
WHEAT AND FLOUR	580.69	4062.41	5.05	31.9	6844.69
MAIZE	528.77	4052.62	0.43	0.99	6234.93
RICE	0.87	2	143.33	585.77	6176.27
BARLEY	0.1	0.98	0.01	0.22	141.45
<b>POTATOES</b>	40.14	69.48	42.04	296.29	2039.35
<b>PULSES (TOTAL)</b>	115.39	392.96	7.93	20.84	423.6
<b>VEGETABLES (TOTAL)</b>	1.64	3.22	77.78	391.77	15477.37
<b>FRUITS (TOTAL)</b>	37.95	60.5	60.43	227.31	7875.66
<b>SUGAR (REFINED)</b>	63.74	332.39	16.58	67.45	1403
<b>FATS &amp; OILS (TOTAL)</b>	195.01	313.26	24.46	35.39	249.72
<b>MEAT (TOTAL)</b>	177.88	126.09	1.79	1.46	1612.06
RED MEAT	177.78	126	0.79	0.72	783.06
POULTRY MEAT	0.1	0.09	1	0.74	829
<b>FISH</b>	86.86	163.01	2.91	3.13	767.9
<b>EGGS</b>	-	-	8.17	1.85	351.75
<b>MILK &amp; DAIRY PROD.</b>	125.98	1097.42	14.7	51.84	5148
<b>TOTAL</b>	<b>1963.13</b>		<b>405.71</b>		

Source: Arab Organization for Agricultural Development, Annual Agricultural Statistics Book 2004, Khartum – Sudan.

### Appendix (10) - Egypt: Area, yield and output of Cereal, Legumes and Fodder Crops throughout (2000-2004)

Area in Hektar, Yield in Ton/Hek, Production in Thousand Tons

Years	Wheat			Rice Summer Crops		
Crops	Area	Yield	Production	Area	Yield	Production
<b>2000</b>	853.3	6.7	5678.3	659.2	9.1	6000.5
<b>2001</b>	983.9	6.4	6250.8	563.2	9.8	5226.7
<b>2002</b>	1029.4	6.4	6624.9	650.2	9.4	6109.7
<b>2003</b>	1053.2	6.6	6624.9	650.2	9.4	6109.7
<b>2004</b>	1085.6	6.6	7177.8	628.2	9.8	6174.4

Years	Maize			Clover		
Crops	Area	Yield	Production	Area	Yield	Production
<b>2000</b>	681.9	8.0	5482.5	760.5	68.1	517.1
<b>2001</b>	718.6	8.2	5876.6	812.6	67.1	54655.0
<b>2002</b>	652.0	8.1	5278.4	838.3	69.9	58583.0
<b>2003</b>	652.0	8.1	5278.4	826.1	70.1	58583.0
<b>2004</b>	702.1	8.2	5839.9	794.1	71.7	56945.7

This table and the following includes the summer crops of 2003.

The data on most of summer crops of 2004 are not available until now.

Source: Ministry of Agriculture, Economic Affairs Sector, the General Authority for Statistics, unpublished data.

### Appendix (11) - Egypt: Area, yield and output of Cash Crops throughout (2000/2004)

Area in thousand Hektar, Yield in Ton/Hektar, Production in Thousand Tons

Years	Sugar Cane			Sugar Beet		
Crops	Area	Yield	Production	Area	Yield	Production
<b>2000</b>	134	117.2	15705.8	52	51	2678
<b>2001</b>	131	118.8	15571.5	60	48	2857.7
<b>2002</b>	135	118.9	1601.6	65	49	3168.3
<b>2003</b>	136	117.9	1633.4	55	49	2691.5
<b>2004</b>	125	120	1500	59	49	2860.5

Years	Cotton			Beans		
Crops	Area	Yield	Production	Area	Yield	Production
<b>2000</b>	218	2.54	553.8	83.2	3.2	262.9
<b>2001</b>	307	2.71	832.2	140	3.1	439.5
<b>2002</b>	294	2.75	809.4	127	3.2	400.9
<b>2003</b>	225	2.64	593.4	106	3.5	336.8
<b>2004</b>	310	1.73	5174.1	100	3.3	330.4

Source: Ministry of Agriculture, Economic Affairs Sector, the General Authority for Statistics, unpublished data.

### Appendix (12) - Development of the area, yield and output of Oily Crops in A.R.E. throughout (2000/2004)

Area in Hektar, Yield in Ton/Hektar, Production in Thousand Tons

Years	Peanuts			Soya Beans		
Crops	Area	Yield	Production	Area	Yield	Production
2000	60.34	3.1	187.2	3.9	2.3	10.5
2001	63.04	3.2	205.1	5.3	2.8	14.9
2002	59.26	3.2	191	5.9	3	17.69
2003	61.33	3.2	195	8.2	3.5	28.68
2004	60.01	2.8	166.9	8.2	3.1	43.42

Years	Sesame			Sunflower		
Crops	Area	Yield	Production	Area	Yield	Production
2000	30	1.2	36.3	12	2.3	27.5
2001	29	1.2	34.8	19	2.3	44.1
2002	30	1.2	36.78	16	2.3	35.041
2003	30	1.2	36.66	14	2.3	31.592
2004	29	1.3	36.93	4	2.4	9.55

Crops in this table are summer crops the data on summer crops of 2004 are not available until now.

Source: Ministry of Agriculture, Economic Affairs Sector, the General Authority for Statistics, unpublished data.

**Appendix (13) - Egypt: Area, yield and output of Vegetable Crops in A.R.E throughout (2000/2004)**

Area in Hektar, Yield in Ton/Hektar, Production in Thousand Tons

Years	Potato								
Crops	Potato Winter Crop			Potato Summer Crop			Potato Nile Crop		
	Area	Yield	Production	Area	Yield	Production	Area	Yield	Production
<b>2000</b>	28.2	23.47	663.2	28.4	26.3	746.8	18.4	19.3	354.9
<b>2001</b>	32.2	24.73	785.1	27.5	25.4	700.8	20	20.9	417.1
<b>2002</b>	34.6	24.6	847.9	27.7	26	719.9	20.3	20.6	417.6
<b>2003</b>	34.8	25.4	882.9	28.5	26.6	759.5	18.9	21	396.8
<b>2004</b>	37.6	24.09	906.03	40.5	28.06	1136.8	25.2	20	503.7

Years	Tomato					
Crops	Tomato Winter Crop			Tomato Summer Crop		
	Area	Yield	Production	Area	Yield	Production
<b>2000</b>	74.5	38.79	2883.1	88.8	31.87	2831
<b>2001</b>	66.3	40.15	2662.2	84.4	31.73	2677.8
<b>2002</b>	72.6	41.3	2998.1	85.3	31.79	2707.5
<b>2003</b>	74.6	42	3133.7	84.8	33.04	2804.4
<b>2004</b>	82.7	43.3	3580.5	82.8	35.4	2931.9

Source: Ministry of Agriculture, Economic Affairs Sector, the General Authority for Statistics, unpublished data.

### Appendix (14) - Development of the area, yield and output of Vegetable Crops in A.R.E. throughout (2000/2004)

Area in Hektar, Yield in Ton/Hektar, Production in Thousand Tons

Years	Onion					
	Onion Winter Crop			Onion Nile Crop		
Crops	Area	Yield	Production	Area	Yield	Production
<b>2000</b>	28.6	26.66	763	2.4	28.8	70.3
<b>2001</b>	22.7	27.7	628.4	4	28.92	116.8
<b>2002</b>	27	27.96	754.9	—	—	—
<b>2003</b>	23.2	29.5	686.3	3.9	28.7	112.1
<b>2004</b>	28.8	31.1	895.5	4.5	31.6	142.3

Source: Ministry of Agriculture, Economic Affairs Sector, the General Authority for Statistics, unpublished data.



### Appendix (15) - Area, yield and output of Fruit Crops throughout (2000/2004)

Area in Hektar, Yield in Ton/Hektar - Production in Thousand Tons

<b>Years</b>	<b>Orange</b>			<b>Mango</b>		
<b>Crops</b>	<b>Area</b>	<b>Yield</b>	<b>Production</b>	<b>Area</b>	<b>Yield</b>	<b>Production</b>
<b>2000</b>	84.5	19.06	1610.5	27.1	11.04	298.8
<b>2001</b>	83.6	20.28	1696.3	27.8	11.73	325.5
<b>2002</b>	83.6	21.63	1808.6	28.8	9.98	287.3
<b>2003</b>	83.6	21.63	1808.6	28.8	9.98	287.3
<b>2004</b>	91.7	22.4	1850.02	54.3	11.04	375.4

<b>Years</b>	<b>Grapes</b>			<b>Banana</b>		
<b>Crops</b>	<b>Area</b>	<b>Yield</b>	<b>Production</b>	<b>Area</b>	<b>Yield</b>	<b>Production</b>
<b>2000</b>	54.5	19.73	1075.1	19.2	39.61	760.5
<b>2001</b>	54.9	19.66	1078.9	20.7	41.03	849.3
<b>2002</b>	56.3	19.07	1073.8	21.1	41.59	877.6
<b>2003</b>	56.3	19.07	1073.8	21.1	41.59	877.6
<b>2004</b>	57.7	22.1	1275.2	21.1	41.49	875.1

Source: Ministry of Agriculture, Economic Affairs Sector, the General Authority for Statistics, unpublished data.

### Appendix (16) - Development of the wholesale price and the consumer price for Red Meat in A.R.E. throughout (2000/2003)

L.E./KGm

Years		2000	2001	2002	2003
Price of Crops					
Cow Meat	Wholesale Price	12.9	13.61	12.28	17.86
	Consumer Price	17.35	18.09	15.73	20.8
Buffalo Meat	Wholesale Price	9.85	9.98	12.35	15.3
	Consumer Price	13.44	14.21	15.66	18.98
Large Mutton Meat	Wholesale Price	12.3	13.43	14.54	17.3
	Consumer Price	15.2	17.18	17.41	19.93
Goat Meat	Wholesale Price	11.62	13.11	13.81	16.24
	Consumer Price	16.03	16.47	16.86	18.94

Source: CAPMAS (IBID).

**Appendix (17) - Development of the farm price an the consumer price  
for the main Crops in A.R.E throughout (2000-2003)**

L.E./Ton

Years		2000	2001	2002	2003
Price of Crops					
Wheat	Farm Price	692.7	700.7	718	760
	Consumer Price	948.3	960	960	1000
Rice	Farm Price	582.7	592.4	671.4	993
	Consumer Price	1112.5	1277	—	1450
Potato Summer Crops	Farm Price	627	627.6	—	714
	Consumer Price	990	1033	—	1450
Tomato Winter Crops	Farm Price	391	392.9	396.7	600
	Winter Consumer Price	1140	846	692	922
Onion Winter Crops	Farm Price	216.5	223.3	228.3	230
	Winter Consumer Price	566.67	711.11	722.22	0
Cotton	Farm Price	2516	2559	2603	3175
Maize	Farm Price	607.1	621.9	628.57	692
	Consumer Price	742.9	764.3		928

<b>Years</b>		<b>Marketing Margins for 2003</b>	
<b>Price of Crops</b>		<b>Amount (difference between FP &amp; CP)</b>	<b>%</b>
<b>Wheat</b>	Farm Price	240	31.6
	Consumer Price		
<b>Rice</b>	Farm Price	457	46.6
	Consumer Price		
<b>Potato Summer Crops</b>	Farm Price	736	103
	Consumer Price		
<b>Tomato Winter Crops</b>	Farm Price	322	53.7
	Winter Consumer Price		
<b>Onion Winter Crops</b>	Farm Price		
	Winter Consumer Price		
<b>Cotton</b>	Farm Price		
<b>Maize</b>	Farm Price	236	34
	Consumer Price		

Source: CAPMAS.

Source of 2003: Ministry of Agriculture & Land Reclamation, Department of Economic Affairs.

### Appendix (18) - Imports of some agricultural items throughout 1999-2004

Q: Quantity in Million ; V: Value in US \$ Million

	Wheat		Corn Flower		Sugar		Tea		Diary Milk		Total of Meat		Total V.
	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V	
<b>1999</b>	5962	547	3585	387	1206	274	73	98	44	75	182	230	1611
<b>2000</b>	4962	719	5162	583	574	196	72	113	30	50	201	244	1905
<b>2001</b>	2818	427	4699	541	438	113	56	99	91	15	100	160	1325
<b>2002</b>	4530	667	4656	583	239	55,7	—	—	—	—	106	190	1495
<b>2003</b>	3400	514	3963	515	314	61	—	—	—	—	90,1	150	1238.9
<b>2004</b>	4286	713.8	—	—	292.3	62.5	—	—	—	—	102.7	181.2	1238.9

Source: CAPMAS - Resource Center - Unpublished Data.

### Appendix (19) - Exports of some agricultural items throughout (1999-2004)

Q: Quantity in 1000 tonne ; V: Value in US \$ Million

	Cotton		Rice		Potato		Onion		Tomato		Orange		Total V.
	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V	
<b>1999</b>	112	238	307	88	256	46	106	9,5	5	1	53	16	399
<b>2000</b>	63	132	393	113	49	7,7	147	12	1,7	0,5	86	17	281.8
<b>2001</b>	82	185	650	132	185	29	166	14	54	1,1	257	50	411.1
<b>2002</b>	161	330	452	103	229	42	293	24	—	—	127	27	525.5
<b>2003</b>	191.8	359.2	779.4	264.2	296.1	34.9	320	33	3.2	.82	166	38.9	739.4
<b>2004</b>	132.4	334.8	803.6	222.7	380.4	66.9	329	34	4.7	1.2	225	66.85	958

Source: Ibid.

### Appendix (20) - Indicators of sub-sectors of AFI, in the public sector in Egypt 1999/2000-2002/2003

LC=Local currency

	1999/2000				2001/2002				2002/2003			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	U	N	M LC	MLC	U	N	M LC	MLC	U	N	M LC	MLC
<b>Fish Industries</b>	2	307	13.7	4.4	2	198	7.2	1	2	189	8.5	2.4
<b>Processed Vegetables</b>	7	767	42.5	6.1	7	788	49.7	12	7	769	6.4	17.6
<b>Oils and Fats</b>	23	16061	1579	186.5	16	12108	1138	144.6	16	11966	1175	157.6
<b>Dairy Milk Industries</b>	7	1379	60.6	13.1	5	1004	65.4	14.7	5	959	52.9	5.8
<b>Mill Products</b>	94	15322	1748	109.2	89	15126	1996	226.8	81	13934	1929	214
<b>Animal Feed</b>	10	1141	155.5	8.1	8	781	149.2	26.5	7	623	167	22.2
<b>Bread, Pastry, Biscuits</b>	129	4524	111	12.7	128	4217	110.4	35.7	121	4065	104	22.6
<b>Sugar</b>	10	14676	1607	309.8	10	12899	1802	494.7	9	12402	2300	559.4
<b>Cacao, Chocolate</b>	2	1138	27.9	-1.3	1	277	9.4	3.6	1	276	6.9	1
<b>Other</b>	13	7145	191.4	115.1	22	2864	224.8	31.2	21	2673	254	9046
<b>Total AFI</b>	301	59557	5594	749.8	285	53304	5584	987.6	270	47856	6004	1049

- (1) Number of enterprises      U = Unit  
 (2) Number of employees  
 (3) Production                      M = Million  
 (4) Value added                    M = Million

Source: CAPMAS ; Annual Statistics of Industrial Production - Public Sector - successive issues.

# **PART V**

## **Indicators of agricultural and food development**

Mahmoud ALLAYA, CIHEAM-IAM Montpellier (France)  
Gabrielle RUCHETON, CIHEAM-IAM Montpellier (France)

### **13.1 - Introduction**

This statistical section contains a short presentation of the main indicators of agricultural and food development in Mediterranean countries.

The data relate to demographic and economic aspects, resources and production means, consumption, and international trade.

In view of the fact that few data are available in several countries in the region, in order to ensure comparability we have deliberately limited our data to the indicators most frequently used for population growth, urbanisation, aggregate economic growth and growth agriculture, food consumption and international trade.

### **13.2 - Notes on methodology**

#### ***13.2.1 - Data source***

The agricultural statistics (land use, production, trade) have been drawn from the United Nations Food and Agriculture Organisation (FAO).

They are collected from the official bodies in the various countries and completed where necessary by estimates made by the FAO on the basis of provisional or unofficial information.

The macroeconomic information concerning population, national accounts, world trade, etc. have been drawn either from the United Nations series of statistics which are published in various yearbooks (statistical yearbooks, yearbooks of national accounts, population yearbooks, yearbooks of international trade) or from World Bank or IMF publications.

### 13.2.2 – Table of indicators

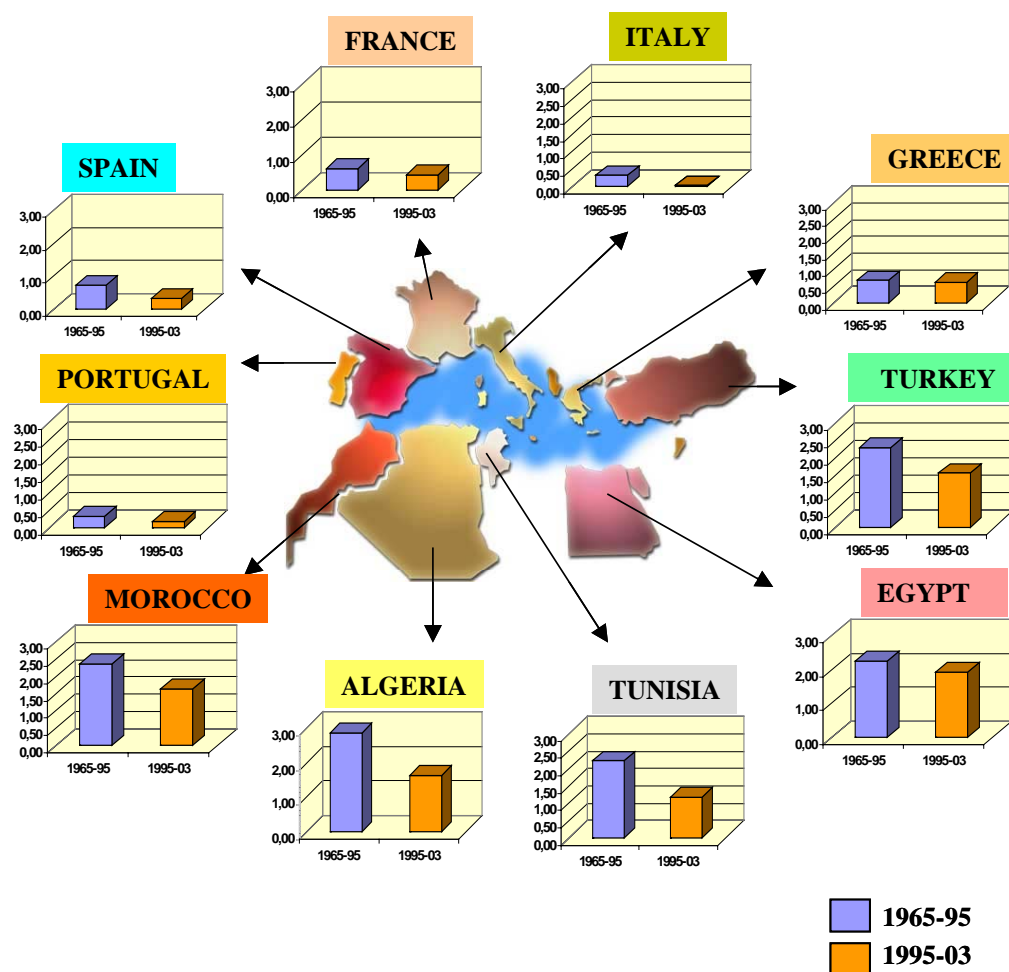
**Table 13.1 - Population, demographic growth, urbanisation, agriculture ratio of employment. 2003**

Country	Tot.pop.	Growth rate.	Urb.pop./ Tot.pop.	Rur.pop./ Tot.pop.	Agr.pop./ Tot.pop.	ALF/ TLF	Inhtts/ A.E.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	mns htts	%	%	%	%	%	
	2003	1965-03	2003				
Albania	3.17	1.40	43.3	56.7	46.3	46.3	4.2
Algeria	31.80	2.62	58.7	41.3	23.2	23.6	11.7
Egypt	71.93	2.19	42.0	58.0	34.7	31.5	8.4
France	60.14	0.55	76.2	23.8	2.9	2.9	77.0
Greece	10.98	0.66	61.1	38.9	12.1	15.2	15.0
Italy	57.42	0.26	67.5	32.5	4.6	4.6	49.6
Lebanon	3.65	1.40	87.9	12.1	3.0	3.1	87.0
Malta	0.39	0.68	91.9	8.1	1.5	1.3	197.0
Morocco	30.57	2.21	57.4	42.6	34.2	33.8	7.1
Portugal	10.06	0.29	54.3	45.7	13.0	11.5	17.1
Spain	41.06	0.65	76.5	23.5	6.3	6.3	35.2
Tunisia	9.83	2.00	63.5	36.5	23.5	23.5	10.2
Turkey	71.33	2.13	66.1	33.9	28.9	44.1	4.8

- (1) Total population in millions of inhabitants
- (2) Average annual demographic growth rate in period 1965-03 (%)
- (3) Part of urban population in the total population (%)
- (4) Part of the rural population in the total population (%)
- (5) Part of the agricultural population in the total population (%)
- (6) Part of the agricultural labour force in the total labour force (%)
- (7) Number of inhabitants per agricultural employee

Source: Medagri 2006, our calculations based on FAO data.



**Figure 13.1 – Demographic growth (%)**

Source: Observatoire Méditerranéen, CIHEAM. [www.medobs.org](http://www.medobs.org)

**Table 13.2 – Gross domestic product, economic growth, agriculture ratio to the GDP**

Country	GDP	GDP/ inhtts	Exchange rate *	GDP Growth rate.	AGDP/ GDP	AGDP/ Agr.E.
	mns \$	\$	LC p 1 \$	%	%	\$
	2004	2003	2004	2004	2003	
	(1)	(2)	(3)	(4)	(5)	(6)
Albania	7600	1934	92.64	6.00	25.3	1593
Algeria	84600	2049	72.061	6.84	11.1	2641
Egypt	77372	938	6.1314	3.20	16.1	1275
France	2018003	29247	0.8454	0.10	2.0	45089
Greece	205240	15784	0.8454	4.70	6.0	14277
Italy	1468284	25570	0.8454	0.30	2.4	30099
Lebanon	21800	5201	1507.5	2.70	12.2	
Malta	5389	11536	0.3441	-	1.6	
Morocco	50100	1431	8.868	5.50	18.3	1872
Portugal	167662	14633	0.8454	-0.80	3.3	8237
Spain	992054	20424	0.8454	2.40	3.6	26052
Tunisia	28181	2546	1.2455	5.50	12.9	3336
Turkey	302007	2573	1.4255	5.79	13.4	1662

(1) Gross Domestic Product in millions of \$ US. 2004

(2) Gross Domestic Product per inhabitant in \$ US. 2003

(3) Exchange rate. Local monetary unit per 1 \$ US. 2004

(4) Average annual growth rate of GDP (%). 2004

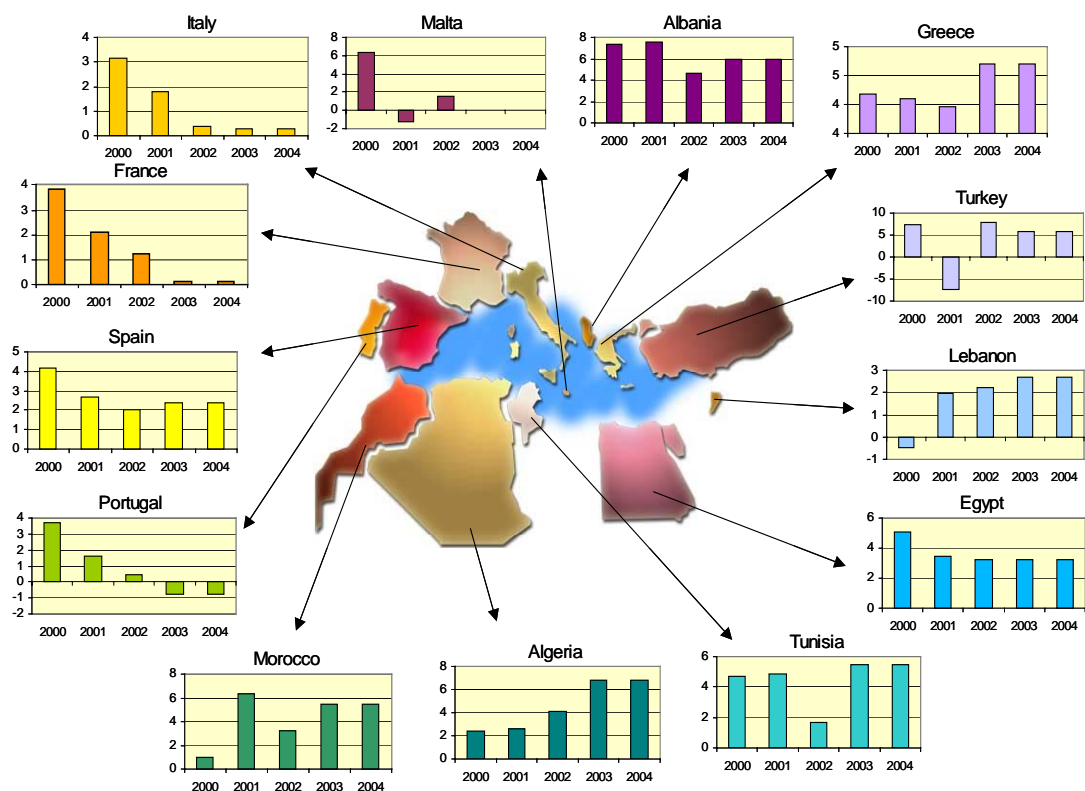
(5) Part of agricultural GDP in the total GDP (%). 2003

(6) Agricultural GDP per agricultural employee (1 \$ US). 2003

\* Euros per 1 \$ US in Spain, France, Greece, Italy and Portugal

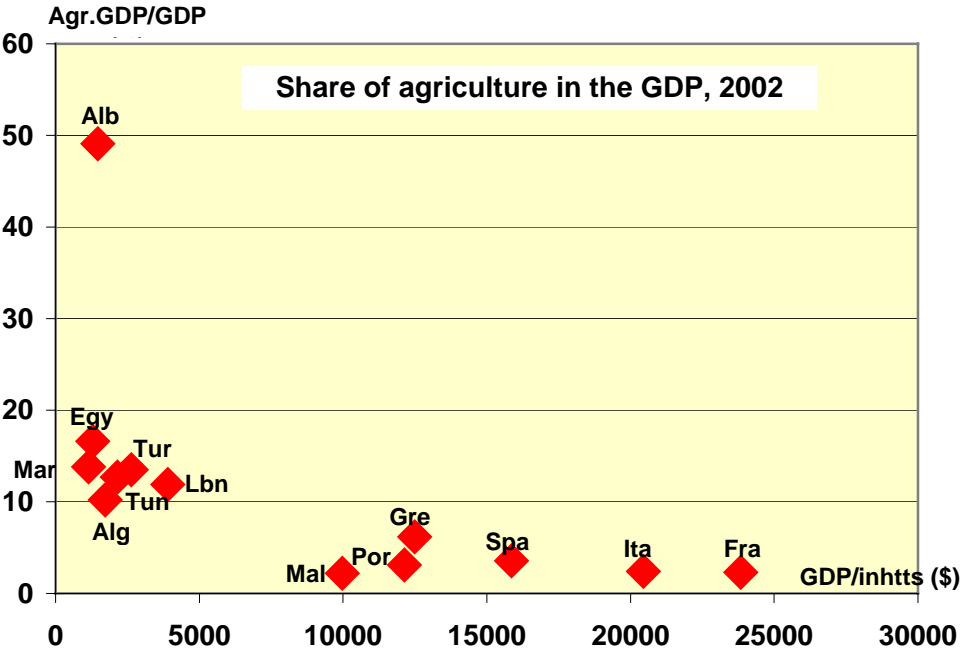
\* LC per 1 \$ = local currency unit per 1 US dollar

Source: Medagri 2006. Our calculations based on FAO data. World bank. IMF and National data.

**Figure 13.2 – Economic growth. Annual growth rate of GDP 2004 (%)**

Source: Observatoire Méditerranéen, CIHEAM. [www.medobs.org](http://www.medobs.org)

Figure 13.3 – Agriculture in the economy, 2002



Source: Observatoire Méditerranéen, CIHEAM. [www.medobs.org](http://www.medobs.org)

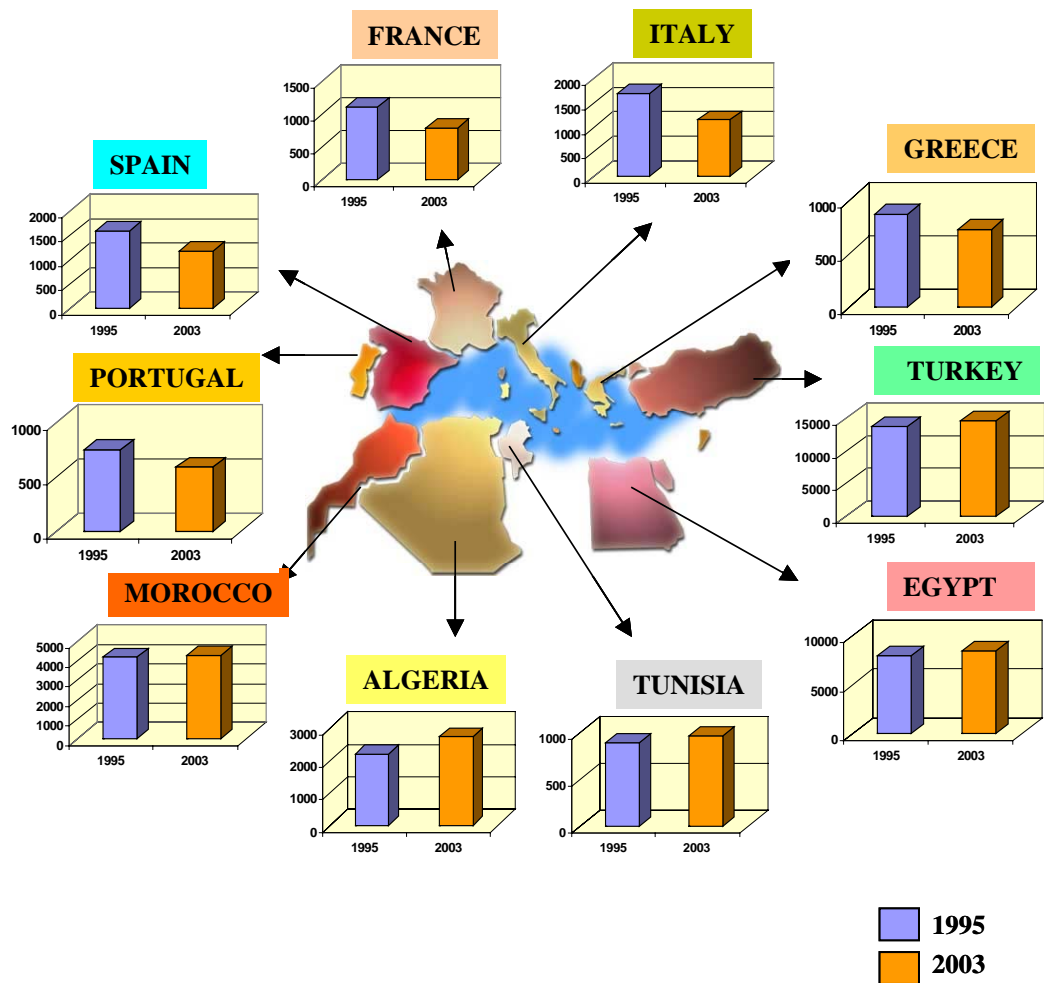
**Table 13.3 – Cultivated areas. irrigated areas. means of production. 2002**

Country	Arable land. perm.crops. 1000 ha	Cult.Land 1000 hts ha	Cult.Land/ Agr.E ha	Irrig.Land/ Cult.Land %	Cult.Land/ tract ha/tract.	Fert/ Cult.Land kg/ha
	(1)	(2)	(3)	(4)	(5)	(6)
Albania	699	223	0.9	49	88	51
Algeria	8265	264	3.1	7	85	12
Egypt	3400	48	0.4	100	38	373
France	19583	327	23.9	13	15	203
Greece	3846	351	5.1	37	15	105
Italy	11064	192	9.1	25	7	129
Lebanon	313	87	7.3	33	38	126
Malta	10	25	5.0	20	20	70
Morocco	9283	309	2.2	14	189	43
Portugal	2705	269	4.4	24	16	77
Spain	18715	457	15.3	20	20	115
Tunisia	4908	505	5.1	8	140	21
Turkey	28523	406	1.9	18	29	61

- (1) Arable land and permanent crops. 1000 ha
- (2) Cultivated land per inhabitant. ha
- (3) Cultivated land per agricultural employee. ha
- (4) Part of irrigated land in the cultivated land. %
- (5) Cultivated land per tractor. ha
- (6) Fertilizers per hectare. kg

Source: Medagri 2006. Our calculations based on FAO data.

**Figure 13.4 – Agricultural labour force (1000 inhabitants)**



Source: Observatoire Méditerranéen, CIHEAM. [www.medobs.org](http://www.medobs.org)

**Table 13.4 – Main agricultural products. 2004**

Country	Cereals	Vegetables	Fruit	Milk	Meat	Sugar	Olive oil
	1000 T						
Albania	522	679	152	1035	73	3	1
Algeria	3994	2919	1766	1668	560		46
Egypt	20261	14874	7471	5320			
France	70534	8808	11034	25182	6313	5139	4
Greece	4584	3999	4081	1970	478	321	403
Italy	22864	16129	17673	11790	4132	1532	615
Lebanon	145	811	849	310	201		5
Malta	12	46	7	47	20	495	
Morocco	8591	5193	2703	1365	600	76	68
Portugal	1287	2329	1935	2061	689		36
Spain	24743	12975	17055	7135	5564	1317	890
Tunisia	2155	2289	1045	895	263		43
Turkey	33967	24099	10851	10478	1560	1500	169

Source: Based on FAO data.

**Table 13.5 – Growth rate of agricultural products. 2004**

Country	Cereals	Vegetables	Fruit	Milk	Meat*	Sugar	Olive oil
	%						
Albania	2.98	2.27	-2.25	0.49	-3.2	0	0
Algeria	-5.51	-1.18	4.43	9.53	1.19		2.78
Egypt	5.36	5.37	0.85	30.22			
France	28.42	1.94	13.4	-0.95	-3.12	20.01	0
Greece	6.96	3.53	-1.05	1.55	-1.33	43.95	9.73
Italy	26.23	6.46	12.36	-2.09	-2.17	56.65	11.81
Lebanon	0.42	-8.68	4.83	26.49	-0.79		6
Malta	-2.5	-9.51	-6.36	-0.51	1.44		
Morocco	7.88	27.33	0.83	3.78	0.25	-85.18	13.33
Portugal	13.49	4.43	6.49	-7.55	-3.91	-100	22.41
Spain	15.56	9.53	-0.09	3.15	2.25	32.49	-33.08
Tunisia	43.38	9.42	3.56	-9.65	5.21		-28.33
Turkey	10.29	-6.2	-3.12	28.41	15.72	-20	141

\* Meat = bovine meat + ovine meat + poultry meat

Source: Medagri 2006. Our calculations based on FAO data.



**Table 13.6 – Food consumption. 2002 (kg/capita /yr)**

Country	Cereals	Root	Sugar	Pulses	Vegetables	Fruit
	(1)	(2)	(3)	(4)	(5)	(6)
Albania	164.5	32.1	26.8	5.3	172.3	82.3
Algeria	217.3	41.1	30.6	6.1	87.1	58.8
Egypt	235.2	22.5	29.9	9.9	174.4	92.4
France	117.3	66.3	40.0	2.0	137.8	100.0
Greece	152.4	67.3	34.5	4.8	245.5	167.0
Italy	161.9	39.8	31.2	5.6	151.0	131.2
Lebanon	125.5	76.3	34.9	9.5	224.1	130.2
Malta	190.3	76.6	49.2	4.6	129.8	105.6
Morocco	247.3	36.6	33.7	7.9	101.2	64.3
Portugal	132.1	127.6	35.0	4.0	174.4	139.0
Spain	98.2	80.9	34.2	5.7	147.7	118.5
Tunisia	204.2	30.3	32.8	6.8	171.2	85.1
Turkey	219.1	60.7	25.8	14.2	224.3	103.5

Country	Meat	Fish	Milk	Oil	Beverages
	(7)	(8)	(9)	(10)	(11)
Albania	39.3	4.1	298.8	11.2	21.0
Algeria	18.3	3.5	118.2	17.5	3.3
Egypt	22.4	15.0	50.2	8.5	1.0
France	102.3	31.3	275.5	37.0	93.4
Greece	83.2	23.3	255.0	31.4	70.4
Italy	92.1	26.2	255.9	38.4	81.4
Lebanon	51.3	12.2	122.7	20.5	10.7
Malta	78.3	50.2	201.1	19.4	49.8
Morocco	20.7	8.8	42.0	12.8	3.0
Portugal	89.2	59.3	219.7	30.7	118.3
Spain	118.5	47.5	158.3	32.0	106.5
Tunisia	24.5	11.1	105.1	23.0	7.2
Turkey	19.2	7.3	98.0	19.3	11.6

(1) Cereals

(2) Roots and tubers

(3) Sugar

(4) Pulses

(5) Vegetables

(6) Fruit

(7) Meat, total

(8) Fish and seafood

(9) Milk and milk products

(10) Oils and fats

(11) Alcoholic beverages

Source: Medagri 2006. Our calculations based on FAO data.

**Table 13.7 – International trade ratios for agricultural products. 2004**

Country	Total Import TI	Total Export TE	Agri. Import AI	Agri. Export AE
million \$				
Albania	2 269	596	289	25
Algeria	18 200	32 300	4 050	55
Egypt	17 975	10 453	3 014	1 314
France	465 229	448 498	34 638	46 642
Greece	52 552	15 190	5 754	3 122
Italy	350 865	348 984	31 694	24 424
Lebanon	9 397	1 747	1 346	252
Malta	3 668	2 490	400	76
Morocco	17 525	9 667	2 058	964
Portugal	54 888	35 750	5 800	2 439
Spain	249 187	178 521	19 798	24 294
Tunisia	12 742	9 682	1 181	974
Turkey	97 540	63 121	4 659	5 958

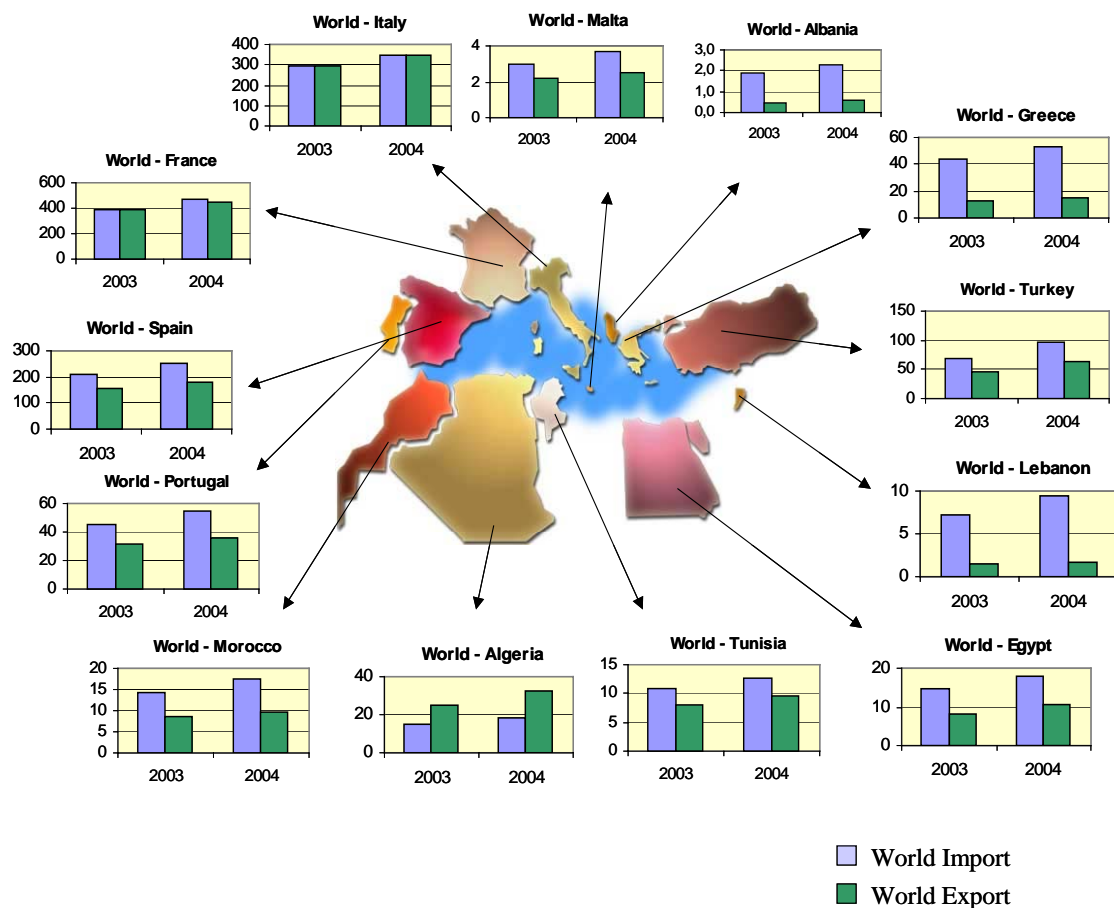
Country	Tot.Bal.std.*	TE / TI	Agr.Bal.Std.**	AE / AI	AI / TI	AE / TE
%						
Albania	-58.39	26.27	-84.10	8.63	12.72	4.18
Algeria	27.92	177.47	-97.32	1.36	22.25	0.17
Egypt	-26.46	58.15	-39.27	43.61	16.77	12.57
France	-1.83	96.40	14.77	134.66	7.45	10.40
Greece	-55.15	28.91	-29.65	54.26	10.95	20.55
Italy	-0.27	99.46	-12.95	77.06	9.03	7.00
Lebanon	-68.65	18.59	-68.43	18.74	14.33	14.44
Malta	-19.12	67.89	-68.08	18.99	10.91	3.05
Morocco	-28.90	55.16	-36.21	46.83	11.74	9.97
Portugal	-21.11	65.13	-40.79	42.05	10.57	6.82
Spain	-16.52	71.64	10.20	122.70	7.95	13.61
Tunisia	-13.64	75.99	-9.62	82.45	9.27	10.06
Turkey	-21.42	64.71	12.23	127.87	4.78	9.44

\* Total Standardized balance =  $(TE - TI) * 100 / (TE + TI)$

\*\* Agricultural Standardized Balance =  $(AE - AI) * 100 / (AE + AI)$

Source: Medagri 2006. Our calculations based on FAO data.

**Figure 13.5 – External agricultural trade, 2001-2002  
(billion \$)**



Source: Observatoire Méditerranéen, CIHEAM. [www.medobs.org](http://www.medobs.org)

**Table 13.8 - Euro-Mediterranean trade. 2003. All products**

Country	EU exports TE*	EU imports TI*	Trade balance TE-TI
	million \$		
Albania	948.9	317.1	631.8
Algeria	6889.0	12972.0	-6082.9
Egypt	5308.3	3004.5	2303.8
France	217623.6	175515.3	42108.3
Greece	21014.6	5715.7	15298.9
Italy	138887.2	116200.5	22686.7
Lebanon	2931.3	162.1	2769.2
Malta	2253.9	843.4	1410.5
Morocco	7145.1	5515.0	1630.1
Portugal	32607.6	21461.6	11146.1
Spain	118094.6	82370.7	35723.9
Tunisia	6340.5	5417.4	923.1
Turkey	25000.8	21260.9	3739.9

\* TE : Total export; TI : Total import

Source: Eurostat 6B- Intra and extra EU trade, 2005.

**Table 13.9 – Share of Euro-Mediterranean trade in the total trade of each country. 2003**

	EU export/ Total Import	EU import/ Total Export
Albania	50.91	70.01
Algeria	46.58	52.52
Egypt	35.82	36.62
France	55.71	45.38
Greece	48.12	43.30
Italy	47.76	39.79
Lebanon	40.88	10.64
Malta	75.13	38.34
Morocco	50.41	63.32
Portugal	72.33	68.42
Spain	56.81	52.85
Tunisia	58.13	67.41
Turkey	36.37	45.35

**Table 13.10 – EU agro-food trade with the Mediterranean countries:  
Exports from the EU to the Mediterranean countries. 2003**

Country	Cereals	Milk	Oils	Sugar	Meat	Total
million \$						
Albania	5	5	11	24	6	51
Algeria	325	281	85	76	0	767
Egypt	155	97	12	29	1	293
France	363	2231	945	572	2724	6835
Greece	135	585	75	48	785	1628
Italy	970	2815	1279	490	3410	8965
Lebanon	9	73	9	40	4	134
Malta	3	21	8	12	15	60
Morocco	186	70	56	5	32	348
Portugal	326	350	231	55	631	1592
Spain	795	1209	259	434	715	3413
Tunisia	96	32	86	35	4	253
Turkey	79	32	62	14	1	188

Country	Cereals	Milk	Oils	Sugar	Meat
1000 T					
Albania	3	3	12	10	9
Algeria	2241	132	127	332	0
Egypt	1243	55	12	112	0
France	1171	1435	903	646	1022
Greece	759	319	74	36	325
Italy	5889	2823	989	542	1299
Lebanon	32	29	13	154	1
Malta	13	8	7	35	6
Morocco	1329	44	82	10	2
Portugal	2011	261	184	35	240
Spain	5254	845	399	533	230
Tunisia	699	31	153	162	2
Turkey	459	15	98	27	0

Source: Eurostat 6B- Intra and extra EU trade, 2005.

**Table 13.11 – EU agro-food trade with the Mediterranean countries:  
Imports of the EU from the Mediterranean countries. 2003**

Country	Vegetables	Fruit	Tobacco	Cotton	Total
<b>million \$</b>					
Albania	2	1	2	0	6
Algeria	0	15	0	0	15
Egypt	134	48	0	174	356
France	1434	1445	383	411	3673
Greece	98	303	134	233	768
Italy	707	1796	131	1200	3834
Lebanon	0	0	1	0	2
Malta	2	0	0	1	3
Morocco	341	305	0	35	681
Portugal	104	154	118	139	515
Spain	3631	4223	139	421	8415
Tunisia	6	71	1	61	139
Turkey	212	892	130	502	1736

Country	Vegetables	Fruit	Tobacco	Cotton
<b>1000 T</b>				
Albania	1	2	1	0
Algeria	0	9	0	0
Egypt	259	50	0	61
France	4284	1434	69	69
Greece	67	298	34	104
Italy	680	1765	48	129
Lebanon	1	0	1	0
Malta	4		0	0
Morocco	356	358	0	6
Portugal	163	168	9	18
Spain	3460	4453	29	95
Tunisia	5	48	0	13
Turkey	242	566	29	185

Source: Eurostat 6B- Intra and extra EU trade, 2005.

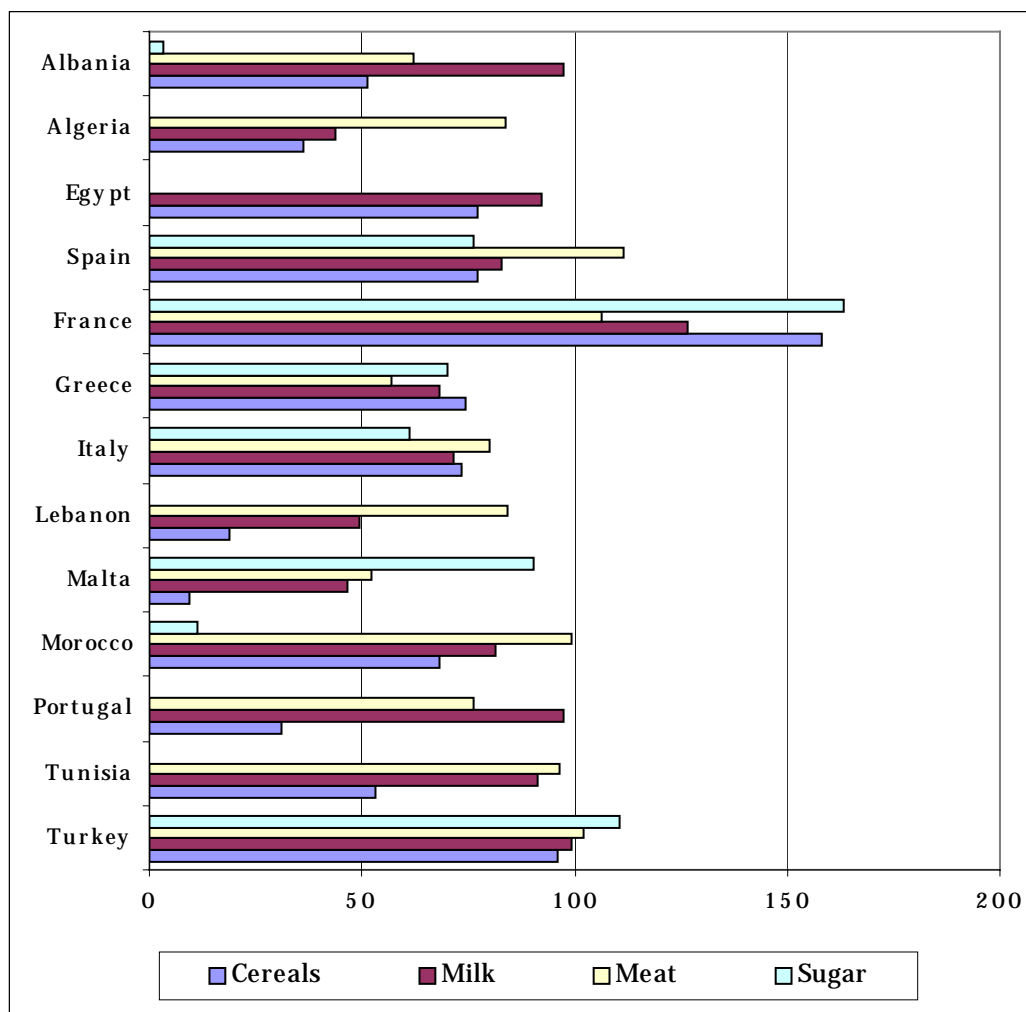
**Table 13.12 – Self Sufficiency ratios for main food products. 2004**

Country	Cereals	Milk	Meat*	Sugar
	%			
Albania	51.12	97.42	62.15	3.43
Algeria	36.31	43.94	83.84	
Egypt	77.23	92.22		
France	158.19	126.70	106.26	163.33
Greece	74.23	68.24	56.91	70.27
Italy	73.46	71.71	80.05	61.34
Lebanon	19.03	49.34	84.21	
Malta	9.21	46.67	52.19	90.34
Morocco	68.24	81.26	99.50	11.26
Portugal	31.24	97.19	76.28	
Spain	76.97	83.06	111.63	76.04
Tunisia	53.00	91.49	96.31	
Turkey	95.98	99.28	101.99	110.65

\* Meat = bovine meat + ovine meat + poultry meat

**Self Sufficiency ratio** =  $\text{production} \times 100 / (\text{production} - \text{export} + \text{import})$

Source: Our calculations based on FAO data.

**Figure 13.6 – Self Sufficiency ratios for main food products. 2004 (%)**

Source: Our calculations based on FAO data.



## **References**

### **PART I**

- Brink, L. (2005): *WTO 2004 Agriculture Framework: Disciplines on Distorting Domestic Support*, International Agricultural Trade Research Consortium, Working Paper #(05-1).
- CIHEAM (2004): Issues on Euro-Mediterranean integration and agricultural policies. *Agri.Med: Agriculture, fishery, food and sustainable rural development in the Mediterranean region*. Annual report 2004, Centre International d'Hautes Etudes Méditerranéennes.
- IPC (2005): *Building on the July Framework Agreement: Options for Agriculture*, International Food & Agricultural Trade, Policy Council, Issue Brief, June 2005, Washington, D.C..
- Petit, M. (2005): *Politiques agricoles américaines et négociations à l'OMC, CIHEAM, L'Observatoire Méditerranéen*, <http://www.medobs.org/themes/default5.htm>.
- Velazquez, B. (2004): *La reforma Fischler y las negociaciones agrícolas en la Organización Mundial del Comercio: compatibilidad y cuestiones abiertas*, V Congreso de Economía Agraria, Asociación Española de Economía Agraria, Santiago de Compostela, Septiembre.
- WTO (2004): “*WTO Agriculture negotiations. The issues and where we are now*”, 1 December 2004.
- WTO (2003): “*Tariff negotiations in agriculture. Reduction methods*”. WTO agriculture negotiations. Background fact sheet. August 2003.

### **PART II Morocco**

- Ait El Mekki A. (2000), La Libéralisation du Secteur Agroalimentaire Stratégique: Une Analyse Multimarché. Thèse de Doctorat. Université Catholique de Louvain, Belgique.
- Banque Mondiale (1994), Royaume du Maroc, Développement Agro-industriel, Contraintes et Opportunités. Rapport no 11721-Mor, Vol II: Annexes Techniques.
- Centre Marocain de Conjoncture (1995), La libéralisation des Produits Sucriers. In *Lettre du CMC* no 39, Février 1995.
- Direction de la Statistique (2001), Enquête Nationale Sur les Niveaux de Vie des Ménages 1998-99.
- Jouve A. M, S. Belghazi et Y. Kheffache (1995), La Filière des Céréales dans les Pays du Maghreb : Constante des Enjeux, Evolution des Politiques. In *Options Méditerranéennes*, Série B, No 14, pp 169-192.
- Laassiri M. & Lakhal M. (2004), Aides Financières Accordées aux Investissements Agricoles. Ministère de l'Agriculture. Direction de l'Enseignement, de la Recherche et du développement.
- Ministère de l'Agriculture (2003), Situation de l'Agriculture Marocaine 2002. Conseil Général du Développement Agricole.
- Ministère de l'Agriculture et du Développement Rural (2004), Bilan de la Campagne Agricole 2002-03. Direction de la Production Végétale.

- Ministère de l'Agriculture (2000), Stratégie des Filières de la Production Végétale à l'horizon 2020. Colloque National de l'Agriculture et du Développement Rural. 19-20 juillet 2000, Rabat.
- Ministère de l'Agriculture (1999), Résultats de l'Enquête Structure. Direction de Programmation et des Affaires Economiques.
- Ministère de l'Agriculture (2002), Résultats du Programme de Sécurisation des Céréales. Direction de la Programmation et des Affaires Economiques.
- Office National Interprofessionnel des céréales et des Légumineuses (2003), Rapport sur la Commercialisation et la Transformation des Céréales et Légumineuses. Campagne 2001-02. (En arabe).
- Office National Interprofessionnel des céréales et des Légumineuses (2004), Rapport sur la Commercialisation et la Transformation des Céréales et Légumineuses. Campagne 2002-03. (En arabe).
- Wilcock D. et L. Salinger (1994), La Réforme de la Politique Céréalière Marocaine au Carrefour : Rapport Final du Projet. Rapport PRCC 20, Development Alternatives Inc, Maryland, USA.

#### **Major web sites:**

[www.madrpm.gov.ma](http://www.madrpm.gov.ma): Ministère de l'Agriculture  
[www.mcinet.gov.ma](http://www.mcinet.gov.ma): Ministère de l'Industrie et du Commerce  
[www.onicl.org.ma](http://www.onicl.org.ma): Office National Interprofessionnel des Céréales et Légumineuses  
[www.oc.gov.ma](http://www.oc.gov.ma): Office des Changes  
[www.hcp-statistic.gov.ma](http://www.hcp-statistic.gov.ma): Direction de la Statistique  
[www.usda.gov](http://www.usda.gov): Département de l'Agriculture, USA  
[www.europa.eu.int](http://www.europa.eu.int): Union Européenne

#### **Spain**

- Agriculture, Fish and Food Ministry (MAPA) (2003) White Book on Agriculture and Rural Development.
- Agriculture, Fish and Food Ministry (MAPA) (2004) Diagnosis and Strategic Analysis of Spanis Agrifood System.
- INCERHPAN and Saborá (2000) "Integral Plan to promote quality wheat in Spain".
- Reports of FEGA (several years).
- MAPA Agrofood Statistics Yearbook (several years).

#### **Turkey**

- <http://www.dtm.gov.tr/ithalat/mevzu/ithmevzu/ithrejkarari/onsayfa.htm>
- Cakmak E. H., H. Kasnakoglu and H. Akder (1999), *Search for New Balances in Agricultural Policies: Case of Turkey*, Turkish Industrialists' and Businessmen's Association, Istanbul.
- *FAOSTAT*, FAO of UN, 2005.
- Kasnakoglu, H., E. H. Cakmak (2000), "The Fiscal Burden and Distribution of Costs and Benefits of Agricultural Support Policies in Turkey", in *Agricultural Support Policies in Transition Economies*, A. Valdes (ed.), World Bank Technical Paper No: 470, Washington, D.C.
- EU Commission (2003). **Agricultural Situation in the Candidate Countries.** Country Report: **Turkey**. DG-AGRI. **November 2003**. Brussels.
- SIS (State Institute of Statistics) (2001), Foreign Trade Statistics, various years and files, Ankara.

- SIS (State Institute of Statistics) (1998), *Agricultural Structure and Employment in Turkey*, no.2209, Ankara.
- Akder, H., H. Kasnakoglu and E. H. Cakmak (1999), "Sources of Growth in Turkish Agriculture," *METU Studies in Development*, Vol. 26, No. 3-4, pp. 227-251. .
- Cakmak E. H. and H. Akder (2005), *Turkish Agriculture in the 21st. Century with Special Reference to the Developments in the WTO and EU*, Turkish Industrialists' and Businessmen's Association, Publication No. T/2005-06/397, June, Istanbul.
- Cakmak E. H., H. Kasnakoglu and H. Akder (1999), *Search for New Balances in Agricultural Policies: Case of Turkey*, Turkish Industrialists' and Businessmen's Association, Istanbul.
- EU Commission (2003), *Agricultural Situation in the Candidate Countries. Country Report: Turkey*, DG-AGRI, November 2003, Brussels.
- FAOSTAT, FAO of UN, 2005a.
- FAOSTAT, WATM (World Agricultural Trade Matrix), FAO of UN, 2005b.
- Kasnakoglu, H. and E. H. Cakmak (2000), "The Fiscal Burden and Distribution of Costs and Benefits of Agricultural Support Policies in Turkey", in *Agricultural Support Policies in Transition Economies*, A. Valdes (ed.), World Bank Technical Paper No: 470, Washington, D.C.
- OECD (2005), *Producer and Consumer Support Estimates*, OECD Database 1986-2004, [http://www.oecd.org/document/58/0,2340,en\\_2649\\_33773\\_32264698\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/58/0,2340,en_2649_33773_32264698_1_1_1_1,00.html), Directorate for Food, Agriculture and Fisheries, visited in September 2005.
- SIS (State Institute of Statistics) (2005), *Agricultural Structure and Production: Production, Area and Value*, Various files obtained from SIS, Ankara.
- SIS (2003), *Agricultural Structure and Production: Production, Area and Value*, SIS Pub. No. 2578, Ankara.
- SIS (2001), *Foreign Trade Statistics*, various years and files, Ankara.
- SIS (1999), *Agricultural Structure and Production: Production, Area and Value*, SIS Publication, Ankara.
- SIS (1989), *Agricultural Structure and Production: Production, Area and Value*, SIS Publication, Ankara.
- TMO (Soil Products Office) (2005), *Cereal Purchases of TMO*, 2005/06, <http://www.tmo.gov.tr/index.php?plugin=News01&p=info&id=93>, visited in October 2005.
- UFT (Undersecretariat of Foreign Trade) (2005), *Import Policies and Measures*, <http://www.dtm.gov.tr/ithalat/mevzu/ithmevzu/ithrejkarari/onsayfa.htm>, visited in October 2005.

### PART III

#### Chapter 7

- **Ait El Mekki A, Ghersi G, Hamimaz R, Rastoin J-L (2002)**, ONA, Prospective agro-alimentaire 2010,
- **Annual Report on the Functioning of the RASFF, 2002, 2003, 2004, Rapid Alert System for Food and feed (RASFF)**, European Commission Health & Consumer Protection Directorate-General, Directorate D - Food Safety: production and distribution chain D5 – Relations with the European Food safety Authority; Rapid Alert System.

- **Cohen N, Enaji H, Karaouane B, Karib H (2003)**, Qualité des viandes produites sur le Grand Casablanca. Premier Symposium International de Virologie au Maroc, 11-12 décembre 2003, Tanger.
- **Commission Européenne, Direction générale santé et protection du consommateur, (2001)**, Rapport final concernant une mission au Maroc (28 mai au 9 juin 2001) visant à évaluer les services officiels compétents pour le contrôle des conditions de production et d'exportation des produits de la pêche et des mollusques bivalves vivants.
- **Deuxième Forum mondial FAO/OMS des responsables de la sécurité sanitaire des ALIMENTS, Bangkok (Thaïlande), 12-14 octobre 2004**, «Renforcement du système national de contrôle de la sécurité sanitaire des aliments, expérience du Maroc»
- **E. Hanak, E. Boutrif, P. Fabre, M. Pineiro, (éditeurs scientifiques, 2002)**, Gestion de la sécurité des aliments dans les pays en développement. Actes de l'atelier international, CIRAD-FAO, 11-13 décembre 2000, Montpellier, France, CIRAD-FAO, Cédérom du CIRAD, Montpellier, France
- **El Baz F (2005 en cours)**, «Les déterminants de la demande de signes de qualité des produits agroalimentaires au Maroc», cas de Rabat, mémoire d'ingénieur agroéconomiste sous la direction de R. Hamimaz, IAV Hassan II.
- **El Hraiki A. El Mahi A., Marhaben A., Talmi A., Laraje R. & Id Sidi Yahia K. (2005)**, Contamination des produits avicoles par les résidus de Fluoroquinolones au Maroc. *Animalis*, 5 (1)
- **Ettabti Abdessadek (2004)**, «La perception de la qualité de la viande rouge fraîche par la ménagère Marocaine, UFR stratégie, faculté de droit, Marrakech».
- **Food Safety Management in Developing Countries**, Gestion de la sécurité des aliments dans les pays en développement, Proceedings of the international workshop, Actes de l'atelier international, 11-13 December 2000, Montpellier, France, 11-13 décembre 2000, Montpellier, France
- **Hamimaz R (2003)**, «La problématique économique des labels dans le système alimentaire marocain» - séminaire national sur la labellisation des produits agroalimentaires, Casablanca
- **Iddoute Mounir (2004)**, Demande Européenne et offre Marocaine des services sur le Marché des Fruits et Légumes frais : cas de primeurs et des Agrumes, mémoire d'ingénieur agroéconomiste sous la direction de R. Hamimaz, IAV Hassan II.
- **Mounir Issam (2004)**, «Perception de la qualité Sanitaire des produits Alimentaires par le consommateur Marocain et par le Touriste» cas des villes de Rabat et de Marrakech, mémoire d'ingénieur agroéconomiste sous la direction de R. Hamimaz, IAV Hassan II.
- **Omar Aloui, Lahcen Kenny (2005)**, the Cost of Compliance with SPS Standards for Moroccan Exports: A Case Study, Agriculture and Rural Development Discussion Paper, the World Bank.

## Chapter 8

- **Agence Bio « France » (2004) : 'Observatoire économique de l'agriculture biologique : La Bio en chiffres 2004'** [format pdf] Adresse URL: <http://www.agence-bio.fr/upload/actu/fichier/Chiffres2004.pdf> (page consultée le 29 juillet 2005).
- **ACNielsen (2004)**. What's hot around the globe. Insights on Growth in food and beverages 2004. Executive news report from ACNielsen Global Services, décembre 2004
- **Agreste Bretagne (2004)**. Industries Agroalimentaires en 2002 Arrêt sur la croissance. *Agreste*, n°48, 2004, p.1-17

- **Aksoy, U. et Can, H.Z. (2004) :** "Report on organic agriculture in the Mediterranean area". Edité par Lina El- Bitar CIHEAM, 2004 Options Méditerranéennes, Series B n.50 (Turkey p. 95)
- **Al-Bitar, L. (2004) :** "Report on organic agriculture in the Mediterranean area" : Edité par Lina El- Bitar CIHEAM, 2004 Options Méditerranéennes, Series B n.50 p.8
- **Al-Damarat, R. (2004) :** "Situation of organic agricultural in Jordan". Communication personnelle avec Lina Al-Bitar : (incluse dans : Report on organic agriculture in the Mediterranean area : Edité par Lina El- Bitar CIHEAM, 2004 Options Méditerranéennes, Series B n.50 p. 13)
- **Antoine, J.-M. (1998).** « Les aliments fonctionnels : la perspective de l'industrie alimentaire » In : *Actes du Forum sur les aliments fonctionnels*, Conseil de l'Europe, 1-2 décembre 1998, Strasbourg
- **Arts-Chiss N., Guillon F. (2003)** « L'alimentation santé, un marché en voie de segmentation : une approche par les bénéfices produits et les risques perçus » In : *Congrès sur les tendances du marketing*, Venise 28-29 novembre 2003
- **Ben Khedher, M. et Nabli, H. (2002) :** "Agriculture biologique en Tunisie", octobre 2002 par Mohamed BEN KHEDHER et Houcem NABLI du Centre technique pour l'agriculture biologique tunisien.
- **Ben Khedher, M. (2004) :** "Report on organic agriculture in the Mediterranean area". Edité par Lina El- Bitar CIHEAM, 2004 Options Méditerranéennes, Series B n.50 (Tunisia p.71).
- **Bteich, M.R. (2002) :** "Towards a strategy for organic agriculture development in Lebanon". Master thesis. CIHEAM. IAMB.
- **Bradley, P. and Marulanda, C. (2000):** "Simplified Hydroponics to reduce global hunger". Acta Hort. No. 554, p.289-295.
- **Callega, E. (2004) :** "Report on organic agriculture in the Mediterranean area." Edité par Lina El- Bitar CIHEAM, 2004 Options Méditerranéennes, Series B n.50 (Malta p. 53).
- **Chicco, P.P. (2002) :** 'Aperçu du marché: Le Marché des aliments biologiques en Italie'. [format HTML] Mars 2002. Service d'exportation agroalimentaire du Canada. Adresse URL: [http://atn-riac.agr.ca/europe/3743\\_f.htm](http://atn-riac.agr.ca/europe/3743_f.htm) (page consultée le 03/08/2005).
- **Chimonidou et Pavlidou, D. (1999):** "Protected cultivation and soilless culture in Cyprus." Proceeding of the First Meeting of the FAO Thematic Working Group of soilless Culture. 2 Septembre 1999. Halkidiki, Grèce).
- **Codex Alimentarius (1999) :** 'Commission du Codex Alimentarius en 1999'. [format pdf] (CAC/GL 32 – 1999 et l'extrait de Règles de base IFOAM, 2000 (disponible sur l'adresse URL: [http://www.ifoam.org/partners/advocacy/pdfs/Codex\\_Guidelines.pdf](http://www.ifoam.org/partners/advocacy/pdfs/Codex_Guidelines.pdf) (page consultée le 25/07/2005).
- **Cooper, A. (1979) :** "The ABC of NFT". Grower Books. London.
- **Délégation générale du Québec à Paris (2003).** *France Santé – Nutraceutique et aliments fonctionnels* [en ligne]. Fiche sectorielle développée par le Service des affaires économiques (signée Gizewski Française). Juin 2003 <http://www.mri.gouv.qc.ca/paris/pdf/fiches/SANTE.pdf>
- **Donnan, R. (1998) :** *Hydroponics around the world. Practical Hydroponics & Greenhouses*, juillet- août 1998, p.18-25.
- **El-Araby, A. (2004) :** "Report on organic agriculture in the Mediterranean area". Edité par Lina El- Bitar CIHEAM, 2004 Options Méditerranéennes, Series B n.50 (Egypt p.29).

- **El-Dahr, H. (2003) : "Le marché des alicaments : un marché spécifique"** de Hiba El Dahr, CIHEAM, 2003 (ISBN : 2-85352- 267-9. ISSN : 0989-473X).
- [http://www.agencebio.fr/upload/pagesEdito/fichiers/dossier\\_presse\\_barometre\\_conso\\_2003.pdf](http://www.agencebio.fr/upload/pagesEdito/fichiers/dossier_presse_barometre_conso_2003.pdf) (page consultée le 30/07/2005).
- **Eshel, I. et Rilov, G. (2004) : "Report on organic agriculture in the Mediterranean area"**. Edité par Lina El- Bitar CIHEAM, 2004 Options Méditerranéennes, Series B n.50 (Israël p.37)
- Eurasanté (ca 2005). *Pôle nutrition, santé, longévité [en ligne]*. 76 p. [Consulté en juillet 2005]. <http://www.eurasante.com/data/presse/dossierPoleNutrition.pdf>
- **Europe et Liberté magazine (2004) : "L'agriculture biologique"** extrait du numéro 38, Octobre 2004).
- **Ferruni, L. (2001) : Albania: "a challenge to the country's agriculture"**. Ecology and Farming, 28:16.
- **Fersino, V. (2001) : "Premio Biol 2003 : Organic agriculture in Mediterranean area"** (CIHEAM-IAMB)(2001) [format pdf] Adresse URL: [www.premiobiol.it/documenti/2003\\_ita\\_fersino001.pdf](http://www.premiobiol.it/documenti/2003_ita_fersino001.pdf) (page consultée le 25/07/2005)
- **Fersino et Petruzzella (2002) : "The organic agriculture in the mediterranean area : state of art"**. CIHEAM- IAMB, options méditerranéennes, series B, n 40 .
- **Grenier, A.; Vasson, M.-P. (2002)**. L'aliment fonctionnel : quel bénéfice santé ? *Biofutur*, hors-série 2002, n°3, p. 34-43
- **Guillon, F. ; Willequet, F. (2002)**. Aliments santé : marché porteur ou bulle marketing ? In : *Déméter 2003 : Economie et stratégies agricoles. Agriculture et alimentation*. Club Déméter; Paris: Armand Colin, 2002. - p. 13-60
- **Hanger, B. (1993) : "Hydroponics: The World, Australian and South Pacific Scene in Commercial Hydroponics in Australasia: A Guide for Growers"**. Pro-Set Pty Ltd. p. 1-12.
- **Hassall et al. (2001) : "Hydroponics as an Agricultural Production System: A report for the Rural Industries Research and Development Corporation"**. Publié en Novembre 2001 (Publication de RIRDC No 01/141) (Projet RIRDC No HAS-9A)
- **Hilliam, M. 1999**. Functional foods. Ready to fly, but far to go? *The World of Ingredients*.: 46-49
- **Hydroponium : 'Link between organic, hydroponics and sustainable production: Environmental Benefits of hydroponic cultures'**. [format HTML]. Adresse URL: <http://www.thehydroponicum.com/> (page consultée le 04/08/2005)
- **IFOAM NORMS (2000) : "IFOAM Basic Standards for Organic Production and Processing"** (IBS) and the IFOAM Accreditation Criteria for Bodies Certifying Organic Production and Processing (IAC). (dernière consultation le 26/07/2005)
- **Inter/Sect Alliance (2001)**. *Business and Market Impact of the Food and Drugs Act and Regulations on Functional Foods in Canada*. Etude effectuée pour le Bureau des Aliments ; Agriculture et Agroalimentaire Canada, 31 juillet 2001
- **Isufi, E. (2004) : "Report on organic agriculture in the Mediterranean area"**. Edité par Lina El- Bitar CIHEAM, 2004 Options Méditerranéennes, Series B n.50 (Albanie p.19).
- **Kenny, L. (2004) : "Report on organic agriculture in the Mediterranean area"**. Edité par Lina El- Bitar CIHEAM, 2004 Options Méditerranéennes, Series B n.50 (Morocco p. 59)
- **Khoury, R. (2004) : "Report on organic agriculture in the Mediterranean area"**. Edité par Lina El- Bitar CIHEAM, 2004 Options Méditerranéennes, Series B n.50 (Lebanon, p.39)

- **Kitous, B. (2003).** *Les alicaments : enjeux et scénarios*. Rennes : Ed. de l'Ecole nationale de la santé publique, 248 p.
- **Kouki, K. (1999) :** "Protected cultivation in Tunisia. Soiless culture: Prospects and challenges". Proceeding of the First Meeting of the FAO Thematic Working Group of soiless Culture. 2 Septembre 1999. Halkidiki, Grèce.
- **Lampkin, N. (2004) :** '*Organic survey in Europe*' (FiBL 2005) [format HTML] (Lampkin, N. from the Institute of Rural Sciences, University of Wales, Llanbadarn Campus, SY23 3AL Aberystwyth Ceredigion) FiBL, 2005 : Adresse URL: <http://www.organic-europe.net/europe%5Feu/statistics.asp> (page consultée le 07/08/2005)
- **Le monde alimentaire (1999).** Aliments fonctionnels et produits pharmaceutiques : Des aliments du futur... pour tout de suite ! (signé Brodeur Carole) mai - juin 1999, p. 23-26
- **Maloupa, E. (2000) :** "Alternative crops and growing systems for vegetables under protected cultivation in Mediterranean conditions". National Ag. Research Foundation of Greece, Thessaloniki, Macedonia, Greece The Canadian Greenhouse Conference, Greenhouse Vegetable Session, Wed. Oct. 4, 2000
- **Makhoul (2004) :** "Report on organic agriculture in the Mediterranean area". Edité par Lina El- Bitar CIHEAM, 2004 Options Méditerranéennes, Series B n.50 (Syria p. 67)
- **Mavrogianopoulos, G. (1999) :** "Protected Horticulture in Greece". In: Proceedings *International Symposium on Growing Media and Hydroponics, Ontario, Canada 19-26 Mai 1997, Edité par AP Papadopoulos*. Acta Hort. 481 p. 771-775.
- **Ministère espagnol de l'agriculture, de l'alimentation et de la pêche (MAPA),** [format HTML] Paeso Infanta Isabel 1, ES- 28071, Madrid, disponible sur l'adresse URL: [www.mapya.es/es/alimentacion/pags/ecologica/info.htm](http://www.mapya.es/es/alimentacion/pags/ecologica/info.htm) (Consultée le 26/07/2005)
- **Ministère français de l'agriculture et de la pêche, France (2005) :** [format HTML]. Adresse URL: [www.agriculture.gouv.fr](http://www.agriculture.gouv.fr). (page consultée le 28/07/2005)
- **Ministère turc de l'agriculture et des affaires rurales (MARA),** [format HTML]. Adresse URL : [www.tarim.gov.tr/](http://www.tarim.gov.tr/) (page consultée le 31/07/2005) (en langue turque).
- **Olympios, C.M. (2002) :** "Overview of soiless culture : Advantages, constraints and perspectives for its use in Mediterranean countries". CIHEAM, 2002 Options Méditerranéennes, Vol 31.
- **Papastylianou, I. (2004) :** "Report on organic agriculture in the Mediterranean area". Edité par Lina El- Bitar, CIHEAM, 2004 Options Méditerranéennes, Series B n.50 (Cyprus p.25)
- **Pardossi, A. and Tognoni, F (1999) - Italy In:** "Proceedings International Symposium on Growing Media and Hydroponics". *Ontario, Canada 19-26 Mai 1997, Edité par AP Papadopoulos*. Acta Hort. 481 p.769-770.
- **Petruzzella et Verrastro (2003) :** "Strategy for promotion of organic farming in the Maltese islands". Development Researchers' Network S.r.l, 79 pages.
- **Piason, F.J. (1999) :** '*France: organic food report 1999*'. USDA Foreign Agricultural Service, Washington DC, USA Gagner-Rapport # Franc 9070 Date 18.10.1999 (Adresse URL : <http://www.fas.usda.gov/gainfiles/199910/25545926.pdf> (page consultée le 02/08/2005)
- **Pinton Organic Consulting et Dr. Zanolì R, Université d'Ancona -** (Adresse URL: [http://www.organic-europe.net/country\\_reports\\_italy](http://www.organic-europe.net/country_reports_italy)) (page consultée le 26/07/2005)



- **Rastoin, J.L. (2004).** Terroirs et mondialisation dans l'agro-alimentaire. In : *Les débats d'Agrobiosciences « Comprendre les agriculteurs du monde »*. Marciac, 6 mai 2004
- **RIA (2002).** "Ingrédients : la santé booste l'innovation", hors-série, 8-9
- **Robertfroid M. (1996).** Functional effects of food components and the gastrointestinal system: chicory fructooligosaccharides. *Nutrition Review*, vol. 54, n° 11, p. S38-S42
- **Rose, N. (2001) :** "**Agriculture biologique en Grèce**". Édité par Slow Food, 27 avril 2001
- **Ruthenberg, H. (1980) :** "**Farming systems in the tropics**". Clarendon Press, Oxford, 323 pages.
- **Schwarz, M. (1995) :** "**Soilless culture management**". Springer, Berlin Heidelberg, 197 p.
- **Telmat, R. et Hadjeres, N. (2003) :** "**Actual situation of organic agriculture in Algeria**". Proceedings of the Arab conference on organic agriculture for a better environment and stronger economy, Tunis, September 27-28, p. 36.
- **Tuzel, Y. et Gul, A. (1999) :** "**Soilless culture in Turkey**". Proceeding of the First Meeting of the FAO Thematic Working Group of soilless Culture. 02 Septembre 1999. Halkidiki, Grèce.
- **UNDP (1996) :** "**Urban Agriculture**". Food, Jobs and Sustainable Cities. New York. 301p.
- **Willer et Yussefi (2004) (Eds.) :** "**The World of Organic Agriculture : Statistics and Emerging Trends 2004**" : Publication IFOAM, 7ème, édition révisée, Février 2005, 197 pages, ISBN 3-934055-51-6
- **Zaabi, K. (2003) :** "**Organic agriculture in Jordan: natural production and safe food**". *Proceedings of the Arab conference on organic agriculture for a better environment and stronger economy*, Tunis, 27-28 Septembre, p. 36.

## Chapter 9

- **Annassi, K.A. (2005) :** "Survey of market potentials of organically grown crops from Lebanon in target EU countries", Master of Science degree.
- **Akgüngör, S. et al. (1999) :** "Estimation of the Potential Demand of Environmentally-friendly Products for the consumers in the Provinces of İstanbul, Ankara and İzmir", Agricultural Economics Research Institute, Ankara, 1999 (in Turkish) Université D'Ege, Izmir, Turquie (14-23 juin 1999) : Abay, Canan, Sedef Akgüngör, Bülent Miran (1999).
- **Babadogan, G. et Koc, D. (2004) :** '*Organic agriculture in Turkey 2004*': [format HTML] FiBL, 2004 report : Research institute on organic farming, 2003. Adresse URL: [http://www.organic-europe.net/country\\_reports/turkey/default.asp](http://www.organic-europe.net/country_reports/turkey/default.asp) (page consultée 27/07/2005).
- **Brombacher, J. et Hamm, U. (1990):** "Was kostet eine Ernährung mit Lebensmitteln aus alternativem Landbau?" *Ökologie & Landbau* 75:8-11.
- **Bteich, M.R. (2004) :** "Options to develop Organic agriculture in Lebanon". *New Medit* 2004 Vol III, N 4 p.44-52 (growers, consumers and institutions) ISSN: 1594-5685.
- Direction Générale de la Santé et de la Protection du Consommateur (2000). Study On Nutritional, Health And Ethical Claims In The European Union For The European Commission [en ligne]. [http://europa.eu.int/comm/consumers/cons\\_int/safe\\_shop/fair\\_bus\\_pract/green\\_pap\\_comm/studies/nutri\\_claim\\_en.pdf](http://europa.eu.int/comm/consumers/cons_int/safe_shop/fair_bus_pract/green_pap_comm/studies/nutri_claim_en.pdf)



- **Codron, J.M. ; Sirieix, L. ; Sterns, J.A. ; Sterns, P. (2002).** Qualité environnementale et sociale des produits alimentaires : offre de signaux et perceptions du consommateur.  
*Ecole Chercheurs : Construction de la qualité des aliments, La Grande Motte, 2002/05/13 ; 2002/05/17 - INRA, Paris. - 2002, 24 p.*
- **INSEE (2002).** La consommation alimentaire depuis quarante ans De plus en plus de produits élaborés. *INSEE Première*, n° 846, mai 2002, p.1-4
- **Enquête CSA/Agence bio (2003) :** 'Baromètre de consommation bio' [format pdf] (Enquête CSA qualitative en face à face à domicile auprès d'un échantillon de 1000 personnes, représentatif de la population française (sexe, âge 18 ans et plus, cat. socio-professionnelle, région et taille d'agglomération). Etude menée du 1<sup>er</sup> au 10 octobre 2003). Adresse URL:
- **Joensen, M. (2003) :** 'Organic foods in Spain 2003' [format pdf], master degree report, Faroe Islands, August 2003. Adresse URL : [http://www.organic-europe.net/country\\_reports/spain/joensen-2003-organic-food-spain.pdf](http://www.organic-europe.net/country_reports/spain/joensen-2003-organic-food-spain.pdf) (page consultée le 29/07/2005)
- **Ministère italien des politiques agroalimentaires (2004) :** [format pdf] Ministero delle Politiche Agroalimentari, Via XX settembre 20, I-00187 Roma  
Adresse URL: [www.politicheagricole.it/PRODUZIONE/AGRIBIO/Italia%202003.pdf](http://www.politicheagricole.it/PRODUZIONE/AGRIBIO/Italia%202003.pdf) (page consultée le 26/07/2005)
- **Oberti, B, Padilla, M. El-Jabri, N., El Honsali I., El Gheri I. (2005) :** " Consumers perception of products preserving environment and health : the case of hydroponic tomatoes in Morocco". The Economics and Policy of Diet and Health, 97<sup>th</sup> seminar, April 2005.
- **Ottman, J. (1992) :** "Sometimes Consumers Will Pay More to Go Green". Advertising Age. 6 juillet 1992 p 14.
- **Padilla, M. et Oberti, B. (2005) :** "Rapport ECOPONICS", Rencontre Perpignan, 21 Juin 2005.
- **Pinton et Zanolì (2004) :** 'Organic Farming in Italy 2004' [format HTML]: Research institute of organic agriculture (FiBL, 2004) par Roberto Pinton, Raffaele Zanolì
- **Smith, R. (1996) :** "Agriculture Council Readies 'Powerful' Program to Capture Consumer's Heart". Feedstuffs. Volume 68 (23). p 1 et 2.

## PART IV

### Spain

- CIHEAM (2005): *Agri. Med. Agriculture, fishery, food and sustainable rural development in the Mediterranean Region*. Annual report 2005.
- ENESA (2005): *Noticias del Seguro Agrario*, n° 41.
- FEGA (2005): *Informe de Actividad 2004. Campaña 2003-2004*.
- FEGA (2004): *Informe de Actividad 2003. Campaña 2002-2003*.
- FIAB (2005): *Informe económico de la Industria Alimentaria 2004*.
- INE (2005a): *Cambio de base de la Contabilidad Nacional de España*. Notas de prensa.
- INE (2005b): *Encuesta sobre la estructura de las explotaciones agrícolas 2003*. Notas de prensa.
- INE online databases. <http://www.ine.es/>

- López, E. (2003): *Los cambios recientes y la tipología actual de las explotaciones agrarias en España; algunas implicaciones para la política agraria*. In Jornada Temática “La agricultura española en el marco de la PAC”, belonging to El Libro Blanco de la Agricultura y el Desarrollo Rural.
- MAPA online databases. <http://www.mapya.es/estadistica/infoestad.html>
- OECD (2005): Economic Survey of Spain, 2005. OECD Observer, Policy Brief.
- Servicio de Estudios La Caixa (2005). *Informe Mensual marzo 2005*.

## **Algeria**

- Benlaïche (Kamel), 2005. « *ERIAD Sétif. Un groupe à vendre* ». In le quotidien El Watan du 11-7-2005.
- Boussaïd (A), 2005. « *Absence de contrôle vétérinaire* ». In le quotidien El Watan du 15 juin 2005 (supplément Economie).
- Cherfaoui (Zine), 2005. « *Les nouvelles priorités* ». In le quotidien El Watan du 22-5-2005.
- Medjahed (Faïçal), 2005. « *Climat de l'investissement en Algérie. Les observations de Nord Sud Export* ». In le quotidien Liberté du 11-4-2005.
- Mejdoub (k.), 2005. « *Nouvelle carte marine. La carte Thalassa mise au placard* ». El Watan Economie, n° 16, 2005.
- Mekfouldji (A.), 2005. « *Corruption, mauvaise gestion, trafic d'influence. La justice s'intéresse à l'ex-wali de Blida* ». In le quotidien El Watan du 22-5-2005.
- Ministre Délégué au Développement Rural, 2005. « *Rapport de synthèse du programme du gouvernement en matière de développement rural* ». Alger. Document polycopié.
- Ministère des Pêches et des ressources halieutiques (MPRH), 2004. « *La pêche et l'aquaculture en Algérie* ». CDROM édité par le MPRH, Alger.
- Ministère de la Petite et Moyenne Entreprise et de l'Artisanat, 2005. « *Statistiques sur la PME et l'artisanat* ». In Bulletin n° 6, 2005.

## **Egypt**

- Agricultural Income Bulletin – for year 2003, Ministry of Agriculture & Land Reclamation - Economic Affairs Sector.
- Annual Agricultural Statistics Book, Arab Organization for Agricultural Development, 2004, Khartoum – Sudan.
- CAPMAS – Annual Statistics of Industrial Production – successive issues.
- CAPMAS – Statistical Yearbook – successive issues.
- Central Bank of Egypt – Time Series of The Egyptian Economic Indicators (<http://www.cbe-org.eg>).
- Central Bank of Egypt, Economic Bulletin – successive issues.
- Economic Bulletin, National Bank of Egypt – Quarterly Newsletter.
- Egyptian Journal of Agri Economics - Egyptian Association of Agri Economics -- different issues.
- Essa Mahmoud, Structural Reform in the Egyptian Agriculture, Conference on Aspects of Structural Reform in Egyptian Economy, Cairo University – April (13-14) 2003.
- Human Development Report (HDR) 2003, UNDP – National Planning Institute – Cairo 2003.
- Liberation of Commerce in The Egy-Euro Partnership Agreement, Part 2 - Ministry of Foreign Trade -- July 2003.

- M.M. Fattah: Arab-Euro Partnership Agreements & The Restructuring of Arab Agriculture, the International Conference on “Activation of The Economic Cooperation between Mediterranean Countries”, Cairo University - November (20-22) 2004.
- M.M. Fattah: Arab-Euro Partnership & Arab Agri Development – Common Conference between The League of Islamic Universities & Florence University/ Italy – Cairo – October 2004.
- M.M. Fattah: Genetically Modified Organisms (GMOs) & Food Security in Egypt – working paper – Common Conference between Al-Azhar University, Delta Academy for Advanced Technology, Cornell University/ USA & Georgia University/ USA.
- M.M. Fattah: Labor Market Flexibility & Employment Security for Egypt – Country Study – ILO Project on Flexicurity – ILO EMP/STRAT – Employment Strategy Department, March 2004 (in English).
- M.M. Fattah: Microcredit & Agriculture: How To Make it Work? Middle East /Africa Region Microcredit Summit – Meeting of Councils – 10-13 October 2004, Amman, Jordan (in English).
- M.M. Fattah: The Legislative Framework of Citrus Sector in Egypt. Working paper – GTZ Citrus Improvement Project – Cairo – May 2004.
- Main Economic & Strategic Trends 2003-2004 – Center for Political & Strategic Studies, Al-Ahram Foundation, January 2004, Cairo.
- Ministry of Agriculture & Land Reclamation– Economic Affairs Sector – Agricultural Production Bulletin – different issues.
- Nassar, Saad, The 2nd Egypt Human Development Report 2005 – Workshop EHDR 2005: vision for Egypt in the year 2005 – Agriculture, 2017. Cairo, June 2005.
- Socio-Economic Development Plan (2002-2007), Ministry of Planning –Cairo 2002.
- Strategy of Agricultural Research Center until 2017 - Ministry of Agriculture & Land Reclamation – March 2003, Cairo.

## PART V

- MEDAGRI (2006): Annuaire des économies agricoles et alimentaires des pays méditerranéens et arabes. M. Allaya, CIHEAM-IAM Montpellier.
- FAOSTAT (2005).
- Banque Mondiale (2004) : Rapport sur le développement dans le monde, 2004.
- CNUCED (2004): Manuel de statistiques du commerce international et du développement.
- EUROSTAT (2005) : Intra and Extra EU Trade.
- FMI (2005) : Statistiques financières internationales.

As it is the case each year, this new edition of the CIHEAM annual report gives a detailed overview on the most recent evolution of the agricultural economies and the agro-food sector in the Mediterranean states which are members of CIHEAM.

2006 report focuses on cereals issue in the Mediterranean with particular regard to production, consumption and trade. Efforts to implement appropriate national policies and to seek international and Euro-Mediterranean cooperation with a view to improving cereals supplies in the Mediterranean region are an absolute imperative and remain the priority.

Observing, analysing, understanding and disseminating information are central to the missions of the CIHEAM and are also the ambition of the present 8th edition of the annual report. The CIHEAM aims to make the knowledge that has been acquired on the agro-food situation and its trends in the countries in the Mediterranean region available to as wide a public as possible – students, journalists, entrepreneurs and political leaders.

ISBN 2-85352-334-9
--------------------