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Agri-Food Chain and Logistics in the Mediterranean

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Agri-Food Trade: challenges for Logistics in the Mediterranean Area

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Though the Mediterranean area is one of the most important economic areas in the world and plays a central role for markets (population growth), trade routes (the junction of three continents) and culture (history, tourism, etc.), yet it cannot fully express its potentials in the global market. Its structural weakness in communication and the historical delays in its development seem to condemn Mediterranean countries to play the minor role of fringe areas in the international scenario, compared to North-Central Europe and to the global players (China, USA, Brazil and Russia). One of the most difficult obstacles to overcome is undoubtedly to organize transport and logistics so that the Mediterranean internal trade becomes more effective and efficient. Concrete actions should be taken to modify and strengthen territorial logistics by rearranging more carefully the system of relations between Mediterranean countries.

The liberalization of international trade will determine a much greater demand for freight exchange and there will be an enormous development in goods traffic in the Mediterranean area. In this perspective, the rise of a Euro-Mediterranean Free Exchange Area can represent an opportunity for Mediterranean countries if they decide to promote the area as an integrated and cooperative system. Agri-food logistics in future scenarios can certainly contribute to the development of the Mediterranean area.

Mediterranean and the Rest of the World. Comparing Large Numbers

The world population keeps on growing at a fast rate. In only half a century (1950-2000), it passed from 2.5 to 6 thousand million people; it is estimated nowadays at 7 thousand million and could reach 8 thousand million in 2025. The growth rate (Da Silva, 2005) is about 80 thousand million inhabitants per year, but it is higher in some regions like Western Asia and South Sahara Africa. A great demographic upward pressure in the Mediterranean South compared with the Northern context can be observed.

In theory, the economic growth of the countries in the southern hemisphere (Africa, South America, South Asia) would move the barycentre of Europe towards the South, and the increasing importance of sea and air traffic in the Mediterranean area implies new strategies of development in many Mediterranean countries. Trade and cultural exchanges in the region are increasing, despite the financial crisis and the current instability in several Mediterranean countries. The establishment of a new social and political equilibrium and the reorganization of mutual relations, founded on active cooperation and trust, may favour, in the long term, the birth of an Euro-Mediterranean area able to match emerging powers.

International Trade and Ports Role

The globalization process is characterized by the free movement of goods, services, capital and knowledge among nations. Some of its consequences are the internationalization of industries and the integration of markets. A clear phenomenon of demographic and economical dynamics is the great increase in traffic between different parts of the world; in sea transport, movements increased by 10% a year from 1985 to 2005, and have continued to rise after the 2008 crisis, though with a lower rate.

The spectacular economic growth of some large areas like China and India is striking. If, in 1996, only Hong Kong was among the top 10 ports in the world for container handling, in 2010, five more ports were added, while others are coming up. The table below (US RITA, 2011) shows the ranking by TEUs of cargo handled of the top 20 world container ports in 2009 and variations in the last 10 years.

The Mediterranean ports are suffering from a significant delay in the investment sector, a weaker economic condition, a lack of integration in transport networks, and European policies which are not beneficial for the regions of the South. The first fifteen ports together move a quantity of containers comparable to that of the world largest ports.

World Container Ports evolution

(Thousands of loaded and unloaded TEUs)

Rank 2000	Rank 2008	Rank 2009	Port Name	Country	2000	2008	2009
2	1	1	Singapore	Singapore	17,04	29,92	25,87
6	2	2	Shanghai	China	5,61	27,98	25
1	3	3	Hong Kong	China	18,1	24,25	20,98
11	4	4	Shenzhen	China	3,99	21,41	18,25
3	5	5	Busan	S. Korea	7,54	13,43	11,96
38	8	6	Guangzhou	China	1,43	11	11,19
13	6	7	Dubaï	Arab Emirates	3,06	11,83	11,12
65	7	8	Ningbo	China	902	11,23	10,5
24	10	9	Qingdao	China	2,12	10,32	10,26
5	9	10	Rotterdam	Netherlands	6,28	10,8	9,74
32	14	11	Tianjin	China	1,71	8,5	8,7
4	12	12	Kaohsiung	Taiwan	7,43	9,68	8,58
12	15	13	Port Klang	Malaysia	3,21	7,97	7,31
10	13	14	Antwerp	Belgium	4,08	8,66	7,31
9	11	15	Hambourg	Germany	4,25	9,7	7,01
7	16	16	Los Angeles	USA	4,88	7,85	6,75
113	18	17	Tanjung Pelepas	Malaysia	418	5,6	6
8	17	18	Long Beach	USA	4,6	6,49	5,07
49	22	19	Xiamen	China	1,09	5,04	4,68
25	21	20	Laem Chabang	Thailand	2,11	5,13	4,62

Source: US DoT, Research and Innovative Technology Administration

Mediterranean Container Ports evolution

(Thousands of loaded and unloaded TEUs)

Rank 2008	Rank 2009	Port name	Country	2008	2009
1	1	Valencia	Spain	3,59	3,65
4	2	Port Said	Egypt	3,2	3,47
3	3	Algeciras	Spain	3,32	3,04
2	4	Gioia Tauro	Italy	3,47	2,86
5	5	Marsaxlokk	Malta	2,3	2,26
6	6	Ambarli	Turkey	2,26	1,84
7	7	Genoa	Italy	1,77	1,53
11	8	Damietta	Egypt	1,24	1,26
9	9	Haifa	Israel	1,4	1,14
10	10	La Spezia	Italy	1,25	1,05
13	11	Mersin	Turkey	844	843
12	12	Izmir	Turkey	895	826
14	13	Taranto	Italy	786	741
8	14	Constanta	Romania	1,38	594
15	15	Livorno	Italy	778	592

Source : http//www.confetra.it/it/centrostudi/statistiche.htm

In order to obtain greater economic advantages from international trade, the governments of many states spend a lot on infrastructures, transport services and logistics development planning. Some of the most significant international transport system projects are the enlargement of the Panama and Suez canals; the development of the Asiatic railway to adapt it to great capacity block trains (Trans-Siberian line, China-Russia lines); the extension or creation of new ports, above all along Asian coasts, but also in the Mediterranean. Concerning the Mediterranean area, the prospective study conducted by Plan Bleu (Vallouis, 2010) reveals that "the conditions of a contribution by transport to Mediterranean integration are to be sought in strengthening proximity exchanges in order to facilitate the complementarity of the productive system, as well as in revising the trend towards gigantism".

Today, ports are considered no longer isolated functional nodes of the transportation chain, but fundamental components of a seamless supply chain, working along with satellite and inland terminals. At the same time, maritime terminals sometimes function as extended warehouses, providing a flexible virtual inventory. In this sense some initiatives focus on the creation of integrated regional port systems as Apulian (Greenmed Journal, 2012) and Calabrian ports, and the improvement of the railway (cases of Gioia Tauro, Algeciras, Valencia). Hypothesis of stronger cooperation among ports with common interests are rising, for instance, between the container ports of the South Italy (Russo, 2010).

The action of great economical lobbies or emergent nations should also be taken into account in the scenario perspectives. An exemple may be China's state-owned shipping giant Cosco. It recently took control of Pier Two of Piraeus port in a €3.3 billion deal, to lease the pier for the next 35 years, investing €564 million in upgrading the port facilities, building a new pier and almost tripling the volume of cargo that it can handle. The Chinese envisage creating a network of ports, logistics centres and railways to distribute their products across Europe, in essence a modern Silk Road, hastening the speed of East-West trade and creating a valuable economic foothold on the continent. According to some analysts, they aim to make the container port of Piraeus a hub to compete with Rotterdam, Europe's largest port (Harriet, 2010).

Agri-Food in the Scenario Prospects for the Mediterranean Area

The increasing international traffic also has an impact in the international agri-food system (Gattuso, 2008). The exchange of agricultural goods is rising all the time and the typology of the exchanged goods changes. Some traditional products like coffee and sugar have lost their importance compared to others like fruit, vegetables and dairy products (Da Silva, 2005).

In one hand, a great development in international trade can be observed. In particular, dried fruit demand has increased and the consumers are ready to pay more for out-of-season fruit. They are available on the market because, thanks to conservation technologies applied even to long-distance transportation (controlled refrigeration vehicles), it has become possible to maintain the quality. On the other hand, the tendency towards market liberalization encourages exports and Europe plays an important role in this market sector. Currently, it is the second dried fruit producer and exporter, but the exports value is rising. The main markets for European exports are those of less distant countries such as Switzerland, Norway, and Russia, but exports of quality products to Japan, China, United States, Canada, and Brazil is also increasing. The most exported products are citrus fruits, grapes and apples. But the Mediterranean area can play a key role if the South-East countries develop initiatives in this field, like Turkey and Morocco which are major exporters in fruit, vegetables, vegetables preserves, meat and fish.

The Logistic Challenges

There are considerable development opportunities for Mediterranean countries in the agri-food sector, both in terms of mutual exchange dynamics and in terms of intercontinental trade. However, any effort to improve quality and increase the quantity of the products to export may be vain without an adequate logistics policy.

It is clear that the supply chain management in the agri-food industry is strongly influenced by information exchange. Main distributors constantly monitor what consumers buy and how they behave in order to become more efficient and competitive on the market. Computers and communication systems are used more and more to follow the movements of goods in order to guarantee safety and quality. Bar codes, RFIDs, mobile phones are some examples, as well as robot applications for the management of processes and control, handling and transport of fruit and vegetables. Yet, logistic problems also concern the organization of a rational and effective exchange network, i.e. better equipment of ports, hierarchization of interchange nodes, optimization of maritime services, greater global productivity of networks.

Actually, Euro-Mediterranean relations are still weak; conventional and container shipping services are not frequent, except for a few cases; and goods movements are extremely slow. For instance, in the interchange between Italy and the Middle East, full container and Ro-Ro shipping services offer weekly or fortnightly shipping and, due to the intermediate calls required by the line, they take 7 to 14 days from port to port. Another strong disadvantage is related to terminal operations, in particular to customs formalities, handling and routing towards final destinations. As a result, the total time is 20-25 days,

which is not competitive compared to road transport. Nevertheless, road transport is far more expensive than sea transport and, therefore, it is hardly bearable for fast-moving consumer goods, such as agri-food products.

The only alternative for certain routes is sea transport, but scheduled services are still not enough. On the other hand, freight movements between the numerous Mediterranean ports are very fragmented and not suitable for direct and frequent scheduled services, since they do not reach minimum mass thresholds.

Among the possible strategies to pursue, it could be useful to create preferential channels for maritime goods movement between Mediterranean shores; to boost synergies able to form a critical mass of traffic, which can lead to faster and more frequent connections; to remove customs obstacles, which are still too many. In order to achieve high logistic performance, hub ports should be identified according to their geographical position and their capacity to concentrate and redistribute flows. For example, the port of Gioia Tauro, or any another port, located on the Ionian coast of Calabria, i.e. Corigliano, could be a site for the concentration of goods coming from different Middle East or Mashrek regions and addressed to Europe. Obviously, the hub would have also positive effects: the creation of sizeable quantities of goods able to foster a regular maritime service; a reduction in navigation distances; greater productivity; more frequent runs and market growth.

To understand how the role of Gioia Tauro can be significant in the Mediterranean and international markets, an example of application/simulation scenario is proposed (Gattuso, 2008), considering an expedition of 1 TEU from Port Said to Munich (Germany) through three different intermodal routes: Port Said-Gioia Tauro-Munich; Port Said-Algeciras-Munich and Port Said-Rotterdam-Munich. For the three routes a comparative analysis in terms of monetary costs and time was carried out (tables below) on two different time horizons (present and future).

Monetary cost of transport for the three intermodal alternatives

Cost (€ / EVP)	*Via Gioia Tauro*		*Via Algeciras*		*Via Rotterdam*	
	Present	*Future*	*Present*	*Future*	*Present*	*Future*
Sea (*)	474	474	744	744	1061	1061
Rail (*)	2099	1599	2939	2439	921	921
Total	*2573*	*2073*	*3683*	*3183*	1982	1982

(*) Costs include the terminal operations across the ports

Cost of time for the three intermodal alternatives

Cost (h)	*Via Gioia Tauro*		*Via Algéciras*		*Via Rotterdam*	
	Présent	*Futur*	*Présent*	*Futur*	*Présent*	*Futur*
Sea (*)	63	63	134	134	218	*218*
Rail (*)	21	21	31	31	12	*12*
Port	70	28	70	28	28	*28*
Total (h) (day)	154 6,5	112 4,5	235 10	193 8	258 11	*258 11*

Today, composing the maritime and rail routes, the way to Rotterdam is the best in monetary terms. Focusing on the time, the way to Gioia Tauro is the cheapest but, in fact, a penalty has to be considered to take into account that current rail services from Gioia Tauro to Central Europe are discontinuous. In a future perspective, improving the railway system through-route from Gioia Tauro, a significant reduction in time and money could be achieved, making the italic corridor competitive compared to others. This would give the possibility to drain significant market shares, bringing a new role at the logistics node Gioia Tauro, and more generally to the Integrated System of Southern Italy, in reference to the agri-food industry too. From this point of view, a project of freight refrigeration platform in Gioia Tauro has been proposed; in the strategic plan for the freight village development, an area has already been identified for supply refrigerator storage and industrial processing of food and agricultural goods. On the other hand, the agri-food sector is certainly the most productive in Calabria and Sicily; it could be enhanced by offering more competitive logistics. The added value could be the composition of agri-food products from around the Mediterranean for export to the major markets of Western and Eastern world.

Conclusions

Transport and logistics can have a driving function, but even in this case it is necessary to improve the "Mediterranean networks". That means also paying attention to the port system and the relationship among the Mediterranean countries, in order to reach the large markets of the Euro-Mediterranean context and of other large developing areas. Logistics development, long networks, competitive commercial ports able to create meaningful relations with their own logistic chains and to connect to the whole territory are given priority. In this situation Italy and Europe have to turn their attention to the South, to Mediterranean regions. The development of the South is fundamental for a steady and lasting growth of the whole Italian and European economies. Being such a large and populated area, with a low per capita income, the Mediterranean area has a high growth potential. This is true also thanks to the many resources available, especially human ones, an interesting potential in the agri-food field.

As development of the South represents an opportunity for Italy, in the same way the South of Europe represents an opportunity for Europe and for the whole Mediterranean area, in the perspective of a balanced competition with other well developed or still developing large areas of the world, such as North America and the so-called BRICS area (Brazil, Russia, India, China, South Africa).

Bibliography

- Da Silva C.A.B. (2005). *The growing role of contract farming in agri-food systems development: drivers, theory and practice. Proceedings of Meeting "Agricultural Management, marketing and Finance Service".* FAO. Rome.
- Commission of the European Communities (2009). *European industry in a changing world. Updated sectoral overview 2009. SEC (2009) 1111. Final Report*. Brussels.
- Gattuso D. (2007). *Problematiche di logistica nel settore agro-alimentare. Gioia Tauro nella rete Euro-Mediterranea. Progetto MATAARI. Logistica agro-alimentare nell'area del Mediterraneo.* (Ed. D.Gattuso). Collana Trasporti. F.Angeli. Milan.
- Gattuso D. (2008). *Agri-food logistics in the Mediterranean area.* Collana Trasporti. F.Angeli. Milan.
- Greenmed Journal (2012). *http://www.greenmed.eu/news-1274.html*
- Harriet A. (2010). *Europe, easy pickings for China*. The Daily Telegraph
- RITA, Bureau of Transportation Statistics (2011). *America's Container Ports: Linking Markets at Home and Abroad*. U.S. Department of Transportation. Research and Innovative Technology Administration. 1200 New Jersey Avenue, SE. Washington, DC 20590
- Russo F. (2010). *I porti container italiani nel sistema euro-mediterraneo. PRIN "Linee guida per la competitività dei porti container italiani nel sistema euro-mediterraneo: criticità e potenzialità dei porti hub di Gioia Tauro, Cagliari e Taranto*. Collana Trasporti. ED. F.Angeli
- Vallouis P. (2010). *Maritime transport of goods in the Mediterranean: outlook 2025*. Blue Plan Papers 7. Agence française de développement

The transport and logistics sector in Turkey

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Development of the logistics sector and transformation of the agri-food system

In Turkey, modern logistics, in other words the « the set of infrastructure, equipment, people and operations which permit the flow of matter, informational and financial, from the purchase of raw materials through production and distribution and to the consumer's table » (R. Ernst, 1998), have developed since the 1980s, following the introduction of structural adjustment policies and the opening up of the economy to the global market. State incentives and a shrinking market have prompted private companies to develop their markets internationally. The textile and agri-food sectors are the two leading exporters to European and Middle Eastern countries.

The 1990s were marked by a logistics boom in Turkey. Over the same period, major agri-tertiary companies and organised distribution brands also gained a foothold, with their own standards and requirements in terms of supply, transport and storage. A technological and organisational upgrade thus became inevitable. At the same time, Turkish exports were also increasing, gradually transforming haulage firms into veritable service-providing logistics companies. Geo-politically speaking, events in the Balkans, the opening up of the economies of the Central and Eastern European countries (CEECs) and the unstable climate in the Middle East all represented constraints for Turkish companies and trade activity. The need to by-pass the conflict zones went hand-in–hand with a policy designed to reduce the cost of transport. This explains the gradual switch made by logistics companies to inter-modal transport and Ro-Ro. The first route was established in 1985 between Istanbul (Haydarpaşa) and Romania (Constanta). Several routes were subsequently set up to transport goods to Italy, Russia, France, Ukraine and again Romania. The private company U.N RO-RO İşletmeleri A.Ş., created in 1994 and taken over by the US financial group KKR in 2007, is still the most active company in Ro-Ro transport between Turkey and European countries.

The 2000s were a period of even more marked expansion in the logistics sector in Turkey. Achieving annual growth rates of 20% since 2005, it ranks as the country's second most dynamic sector behind tourism. More importantly, it secures 39th place for Turkey in global rankings and 3rd place amongst the Southern and Eastern Mediterranean countries in this commercially strategic field, according to the World Bank's Logistics Performance Index (average for the years 2007-2011). The sector is no longer defined by transport alone, now also including 3PL providers (Third Party Logistics), in other words those responsible for providing varying amounts of their clients' logistics. It is a form of outsourcing of warehouse management and transport (and all the associated or related services), which, by definition, are activities requiring enormous investment and which many companies prefer to do without (Ersoy, 2008). The arrival of foreign capital in this sector has also driven this expansion as a result of the technology transferred into the domestic sector by foreign companies. The latter are currently estimated to account for 30% of total logistics market share for the market as a whole (Karadoğan, 2011).

Structure of the transport and logistics sector

According to State statistics (TUİK, 2009), transport and logistics which comprise various professions and activities, employ 1.1 million workers. Road transport dominates the sector, both in terms of companies operating and of the share of commercial transactions. Indeed, in 2009, some 42% of Turkish imports were transported by road (and 46% by sea), this share rising to 59% for exports (Deloitte, 2010). At national level, road transport enjoys even greater supremacy, accounting for about 90% of goods transported (TUİK, 2010).

With a total value of 41 billion Euros in 2008, the transport and logistics sector was then estimated to account for between 8 and 12% of GDP (İGEME, 2009). Moreover, a survey recently conducted by Quattro Business Consulting amongst 502 logistics companies indicates that the sector produces a value

of activities totalling some 120 billion Euros. However, economic vitality in the sector remains highly unevenly spread. This is the direct result of the distrust of 3PL companies shown by industrial companies, the customers of operators in the logistics sector. The major industrial companies tend to pursue strategies involving the internalisation of logistical activity and for strategic reasons avoid sharing refrigerator trucks or warehouses, for example, with competitors. As a result of these suspicions, the share of 3PL companies in domestic GDP still lies below the 10% threshold and their growth rate between 2005 and 2010 barely scraped 7% (compared with an average of 20% for the sector as a whole). Strategies differ, however, for the major agri-industrial companies. Thus companies may be classified according to the way in which they behave and invest in logistics.

The major companies in the transport and logistics sector

Operating on the international scene, these companies are almost exclusively geared towards international trade. It is worth recalling that 54% of exports and 24% of imports are conducted by international haulage companies, numbering 1340 in 2009. (Gülen, 2010). There are also 2000 customs agencies, 250 3PL companies and 200 customs warehouses (Deloitte, 2010). This, however, does nothing to change the heterogeneous and fragmented structure of the sector (Babacan, 2003). Stakeholders in Turkey may be classified into three groups:

- A multitude of micro-enterprises, operating exclusively in domestic road haulage, seeking short term profit on the spot market, with a conventional vision devoid of any forward-looking strategy. They account for two thirds of companies active in the sector;
- A relatively high number of small and medium sized, mainly family firms (SMEs) initially founded for road haulage before evolving into larger logistics companies. Their mode of governance is traditionally based on the personality of the founding entrepreneur and they nurture a dynamic commercial vision;
- Some very large businesses, or holdings, following medium-long term strategies, with modern management, striving to compete at regional and global level. Most of them are 3PLs. In mentioning these businesses, reference should be made to the foreign companies present in Turkey, which set up partnerships which their Turkish counterparts or create their own subsidiary within the country. As global operators, these logistics companies invest heavily abroad and organise their activities at global level. They provide maintenance and transport services for agricultural and agri-industrial products (frozen produce in particular). Some of them specialise more specifically in the logistics of agri-food products (Baynak Lojistik, Netlog Lojistik/Polar XP, CEVA, Omsan).

Ranking of the leading logistics companies in Turkey in 2009

(*) Turkish army pension fund; **(**)** Fortune 500 Turkiye 2010, http://www.fortuneturkey.com/fortune500-2010/; **(***)** company sites; **(e)** estimate

Company	Umbrella group	Turnover 2010 (**) (millions LT)	Turnover 2009 (millions LT)	Variation 2010-2009	Presence abroad (***)
UN Ro-RO İşletmeleri AŞ.	KKR (USA)	p.m.	p.m.		
UPS Türkiye (ex Unsped Paket Servisi)	UPS (USA)	n.c.	355,73	?	
Ceva Lojistik	CEVA Logistics(USA)	551	275,39	100,10%	
Netlog Lojistik Servisi	Famille Çak	459,4	329,03	38,70%	Afghanistan, Romania
Horoz Lojistik	Horoz Şirketler Grubu	430	202,15	112,70%	Germany, Italy, Russia, Poland
Borusan Lojistik Dağıtım	Borusan Holding	395,6	300,47	31,70%	USA, Netherlands, UAE, Algeria, Kazakhstan
Omsan Lojistik	OYAK(*)	340,4	303,83	12,00%	Germany, France, Bulgaria, Romania, Russia, Azerbaijan
Fasdat Gıda Dağıtım	Ata Holding	336,3	219,76	53,00%	
Ekol Lojistik	Invest AD (EAU)	313,1	300,14	4,30%	Germany, Italy, Romania
Balnak Lojistik Grubu	The Great Circle Fund (USA)	281,9	251,16	12,20%	Libya, Egypt
Mersin Uluslararası Liman İşletmeciliği	Akfen Holding, PSA International	273,6	229,14	19,40%	
Reysaş Lojistik	Reysaş Grubu	223,3	220,02	1,50%	Malta
Mars Lojistik	Mars Lojistik Grubu	199,4	210,34	-5,20%	France, Tunisia, Germany, Belgium
Gökbora	Gökbora	175,0 (e)			Germany, Italy, Romania, France, Azerbaijan, Bulgaria

Source : Capital 500, www.capital.com.tr/siralamalar/html/2010.htm

Impact of the strategy of major agri-industrial companies on the structure of the transport and logistics sector in Turkey

Through the organisation of their value chain, industrial companies undoubtedly affect the structure of the logistics sector, since they are the logistics companies' main clients. Some agri-food companies develop their own logistics as a means of better controlling their quality chain, transport and storage costs. This applies in particular to companies involved in meat processing and the dairy industry. Like some poultry companies (Keskinoğlu, Banvit and Gedik Piliç), which have internalised their logistics services, the Sütaş dairy company has created a logistics department with a fleet of 1 055 tanker trucks and 47 distributors (throughout the entire country), supplying some 7 800 sales outlets. Pınar, the agri-food branch of the Yaşar group, uses the logistics services of YBP, another of its parent company's subsidiaries, to supply 152 000 sales outlets within the country. The Efes Pilsen multinational brewing company, a subsidiary of Anadolu Grubu, also internalised its warehousing and transport back in 2005. In 1995, TAB Gıda, an agri-food subsidiary of Ata Holding (franchisee of Burger King, Sbarro, Popeyes and Arby's in Turkey), set up its own logistics department, Fasdat Gıda Dağıtım Sanayii. It has since ranked amongst Turkey's 5 leading logistics companies. Ülker Gıda Sanayii, whose parent company, Yıldız Holding, held 30% of Netlog/Polar XP's capital, is the 2nd largest logistics company in the land. Ülker Grubu continues to use the services of Netlog to distribute its products both on the domestic market and abroad. This is also the case for the domestic transport of frozen goods (Dardanelles, Kerevitaş, …), where the major companies are still wary of outsourcing their logistics activities.

The Turkish subsidiaries of agri-industrial multinationals seem to prefer a different strategy. They more readily outsource their logistical services and work with dedicated providers specialised in agri-logistics. Thus, Nestlé uses the services of Aytas Lojistik to distribute its products in Western Anatolia; Unilever is in partnership with Alişan Nakliyat and Yalçınkaya AŞ ; Coca-Cola with Cemaloğlu and Alp Lojistik ; PepsiCo with Naktaş Lojistik and Danone with TLS and Netlog. Mention should also be made of Hoşcan Lojistik, Güriş Lojistik, Eğretli Lojistik, Karcan Nakliyat, Barsan Global Lojistik (BGL) as some of the major companies in the sector specialised in agri-logistics, which work with large agri-industrial companies such as the State Sugar Company (TürkŞeker), Koska, Eti Grubu, Kraft (including Cadbury/Kent), Çaykur, Tariş, Tekel Alkol, Assan Gıda, Bandırma Gübre, Karin Gıda, Paksoy, Kombassan Un Sanayii and Ova Un Sanayi, amongst others.

Companies exporting fresh products, particularly fruit and vegetables, also rely on logistics companies for transport and transit services (insurance, customs brokerage). Moreover, the increase in the volume and value of fresh fruit and vegetable exports is one of the reasons which prompted companies in the logistics sector in Turkey to open up and invest in RO-RO transport. Finally, it should be pointed out that SMEs, which constitute the vast majority of companies operating in the country's agri-food sector, use the warehousing and transport services of small-scale providers, thereby perpetuating the loose, fragmented structure of the transport and logistics sector.

Future trends: investing in infrastructure and developing internationally

Thus since the late XXth century, transport and logistics have undergone massive change in Turkey. The country is part of the European Transport Networks programme, with corridors IV and X extending as far as Istanbul (Centre d'Analyse Stratégique, 2011). Supported by European Union (EU) pre-accession funding programmes, Turkey is investing widely in railway construction, electrification of the existing network and particularly rail links to port logistics areas. Turkey is also a stakeholder in the TRACECA programme, the Europe-Caucasus-Asia transport corridor, and is developing railways linking Eastern Anatolia (Kars) to Azerbaijan and Georgia. A further major strategic infrastructure programme to which the European Investment Bank (EIB) has contributed is the building of the « Marmaray » tunnel, scheduled in 2013 to link the two shores of Istanbul under the Sea of Marmara using two rail lines- one for urban transport and the other for the main commercial transport routes.

It should also be pointed out that the management of several ports (Bandırma; Samsun and Mersin), for which public State bodies were hitherto responsible, was recently ceded for 36 years to several logistics companies in the private sector which, in return, are planning to invest heavily in infrastructure in order to increase storage and maintenance capacity in these ports. Other sites (Izmir, Iskenderun, Derince) could be similarly privatised in the near future. A further important development concerns the projects to create « Logistical Centres » (Ankara, Samsun, Mersin, Kars and Iskenderun) to enhance the management of intermodal and combined logistics. Such investment is controlled by the local authorities

(municipalities, chambers of commerce and industry) and receives EU subsidies under the pre-accession programme as well as local and national funds topped up by private capital. The private sector has actually started to invest heavily in maritime transport and port management by privatising the ports run until 2005 by the Turkish Railways (TCDD) and the Turkish Maritime Enterprises (Denizcilik İşetmeleri). These changes are prompting the country's leading logistics companies to opt for intermodal and combined transport solutions by investing in port and rail infrastructure.

Finally, Turkey's geo-economic strategy is also worthy of note, the country for several years now having been building a vast network of bilateral trade agreements with the Southern and Eastern Mediterranean countries (SEMCs).

Bilateral Trade Agreements between Turkey and SEMCs

Country	Free trade agreement	Economic, commercial, industrial, technical and scientific agreements	Double taxation avoidence	Agreement on transport facilities	Mutual promotion and protection of investments	Agreement on maritime trade	Agreement on road and air transportation	Agreement tourism
Algeria	X	X	X		X	X		
Egypt	X	X	X	X	X	X		X
Israel	X	X	X		X			X
Jordan	X	X	X	X	X		X	
Libya		X			X			
Lebanon	X	X	X		X		X	
Morocco	X	X			X	X	X	X
Tunisia	X	X	X		X	X	X	X
Syria	X	X	X	X	X		X	X

Source : Sema Kalaycıoğlu, 2011

Clearly then, Turkey can aspire to become a veritable logistical and therefore economic hub. Her strategic geographic location, industrial and commercial drive, investments and forward-looking strategy are all key assets in this respect. Thus at both regional and international level, the expression of Turkish agri-food power will hinge on this logistical dimension. It will, however, have to ensure the modernisation of transport networks (road, rail and maritime) as well as completion of the major infrastructure projects currently underway in Turkey.

Bibliography

– Babacan Muazzez (2003) : « *Lojistik Sektörünün Ülkemizdeki Gelişimi ve Rekabet Vizyonu* », (L'évolution du secteur logistique dans notre pays et sa vision de compétitivité) in Ege Akademik Bakış, Vol. 3, n°1-2, http://eab.ege.edu.tr/pdf/3/C1-S1-2-M2.pdf

– Centre d'Analyse Stratégique (2011), « *Le train à grande vitesse dans le monde : perspectives d'avenir* », R.F. Premier Ministre, http://www.stratégie.gov.fr

– DELOITTE (2010), *Transportation and logistics Industry Report*, R.P. Prime Ministry, http://www.invest.gov.tr

– Ersoy, M. Şakir (2008), *Tedarik Zincirinde Depoların Önemi* (Importance d'Entreposage dans la Chaîne d'Approvisionnement, Durum Dergisi, Ocak sayısı, http://www.turktrade.org.tr/tr/magazine/e53636bb-a261-4729-be59-4f6df32577af/ocak-2008.aspx

– Gülen, Kemal Güven (2010), *Lojistik Sektöründe Durum Analizi ve Rekabetçi Stratejiler*, (Etat des lieux et stratégies concurrentielles dans le secteur de la logistique) ITO, 235 p.

– İGEME, 2009, *http://www.ibp.gov.tr*

– Kalaycıoğlu, Sema (2011), *Dogu'nun sorunlu limanlari ve Turkiye* (les ports à problèmes de l'Orient et la Turquie, Durum Dergisi, Ekim sayısı, http://www.turktrade.org.tr/tr/article/51198da5-d3b5-43ba-91e2-279bef1ec48e/dogu%E2%80%99nun-sorunlu-limanlari-ve-turkiye.aspx

– Karadoğan, Doğan (2011), *Türkiye'de Lojistik Sektörü ve Lojistik Hizmet Üretenler*, (Le secteur logistique en Turquie et les prestataires de services) 22 septembre 2011, http://www.lojistikci.com/?p=3701

– Ricardo Ernst, P. Domier, M. Fender, P. Kouvelis (1998), *Global Operations Management and Logistics: Text and Cases*, John Wiley & Sons.

– TUİK 2009, *http://www.tuik.gov.tr*

– TUİK, 2010 : http://www.tuik.gov.tr

Port logistics and short sea shipping for Spanish fresh fruit and vegetable exports

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Spain is a European and global power in the fresh fruit and vegetable sector, her exports totalling 9.49 million tonnes (MMT) in 2010, i.e. about 40 % of her production. The most-exported products are lemons (3.2 MMT), tomatoes (0.74 MMT), lettuce (0.57 MMT), watermelon (0.49 MMT) and cucumber (0.45 MMT). Spain sells most of her produce on European Union (EU) markets, particularly in Germany, France, the United Kingdom, Netherlands and Portugal, with these five countries alone accounting for almost 70% of total exports.

Spanish fresh fruit and vegetable exports tend to reach these European markets by road. This mode of transport is facing mounting obstacles, however, which are driving up the cost and undermining competitiveness. Given her geographical location, Spain is confronted by a major problem in terms of the long distances to be covered, hence high transport costs. This is why it is more imperative than ever to seek alternative solutions. Given that, in the short term, rail transport is not a viable option and air transport tends to be used to carry high value added products over long distances, maritime transport constitutes the only alternative to road. Although ships have long been the main means of transport for international trade in fruit and vegetables (particularly for fruit imports from third countries), the EU is currently promoting a novel service model: short sea shipping (SSS). It involves the creation of Motorways of the Sea between European and riparian countries and should provide a great opportunity for Spanish fresh fruit and vegetable exports.

This is a particularly interesting option for some of the main production and export areas located near ports (Compés and Baviera, 2006). One of these is the Valencia region- the epicentre of Spanish citrus fruit production, with the ports of Castellón, Sagunto, Valencia and Gandía, as is the area around Almería, one of Europe's most important vegetable production clusters.

Fresh fruit and vegetable trade and transport logistics

The international fresh fruit and vegetables market is one of the pioneers of globalisation in the agri-food sector. Lower trade barriers, shorter journey times and reductions in shipping costs, improved methods for preserving perishable products, investment in specialised terminals in some ports and the expanding markets of the main multinationals in the sector have led to a boom in fresh fruit and vegetable transactions since the 1990s (Cook, 1997; Barceló et al., 1992).

Internationally, this trade is characterised on the one hand by the quantitative significance of certain types of production (particularly bananas, citrus fruit and fruits from the southern hemisphere: apples, grapes, pears and kiwi), exotic fruits and out-of-season vegetables, and, on the other, by the influence of some countries such as Chile, New Zealand and South Africa which, despite their geographical distance, are genuine trading powers. Their production is highly export-oriented and their logistics are based on a very efficient maritime-port chain.

The transport and distribution of fresh fruit and vegetables represents a challenge for port communities. Not all ports are able to meet the requirements pertaining to the length of journey, packaging of goods, reliability of operations being conducted within time limits, stakeholder professionalism, ability to adapt to the needs of commercial distribution chains and the agility of phytosanitary inspection procedures. Moreover, the shipping of perishable goods in specialised ships has the drawback of concentrating a high volume of production in space and time, the main consequence of which is to change the starting price and make it difficult for stakeholders in the agri-food sector to meet commercial and logistical requirements. Some ports within the EU have specialised facilities for this type of traffic. Such is the case of Rotterdam, whose central distribution role in Europe has led to the creation of powerful and efficient commercial and logistical chains, as well as Antwerp in Belgium, Le Havre in France, Bremen and Hamburg in Germany and Vado/Savona and Trieste in Italy (Trienekens and Omta, 2002).

[1]The author would like to thank Anecoop, Valencia Terminal Europa and Dehorsa for their assistance in drafting this article.

Until the 1990s Spain was mainly an exporting power, her domestic market being highly protected. The only significant maritime traffic involved bananas from the Canaries and some exotic fruits. When the market was subsequently opened up traffic increased across the board, both for imports (currently in excess of half a million tonnes, particularly from third countries) and exports. Several ports are actively involved in the maritime trading of fresh fruit and vegetables: La Coruña, Marín-Pontevedra, Vigo and Bilbao on the Atlantic and Cantabrian coasts; Barcelona, Tarragona, Castellón, Sagunto, Valencia, Gandía, Cartagena and Algeciras for the Mediterranean. Some of them have terminals dedicated to perishable products in general or specialised in the transport of fresh fruit and vegetables like « Barcelona Reefer Terminal » in Barcelona; « Friopuerto » in Valencia, « Gandia Reefer Terminal/Dehorsa » in Gandía and « Fruport » in Marín, Tarragona and Algeciras. In the other ports, products normally arrive in refrigerated containers which are then plugged in to the terminal connections.

Port traffic in fruit and vegetables (mt.)
(ports with over 100.000 mt.)

Algeciras	Barcelona	S.C. de Tenerife	Las Palmas	Valencia	Tarragona	Alicante
2202245	505198	531796	404315	332096	253856	140033

Source : Statistical Directory, 2010, State Ports

Competition between ports is fierce for this type of traffic, since it represents high value added and is very attractive. Being involved in this type of traffic is a sign of quality and good logistical performance. But securing loyalty is no easy matter, given that transport and distribution chains are highly dynamic and constantly adapting to changes in the relative advantages of the various modes of transport and ports. A good example of this is provided by fruit and vegetable exports from Morocco. Having taken the Spanish land route for several years, crossing the Strait of Gibraltar, over recent years they have reverted to the maritime chain, using the CMA CGM company and Port-Vendres (France). Some ports have managed to consolidate significant traffic, for example by taking advantage, as has the port of Tarragona, of the specific preservation needs of certain products such as kiwis, which cannot be stored with other fruits.

Compared with total export volumes and the potential of the areas around some ports, the amount of Spanish fresh fruit and vegetables exported by sea is relatively small. The leading commercial centre is the Valencia region, which exports 2.5 million tonnes of fruit and half a million tonnes of vegetables, and where many Spanish companies and operators have their headquarters (Anecoop, Sanlúcar Fruit, Univeg España and Martinavarro). It is followed in second place by the region of Almeria, the leading Spanish province in the production and export of vegetables, which alone exports 1.7 MMT, i.e. 63 % of her production (Fondation Cajamar, 2011). It therefore seems logical that these two areas should be the most interested in promoting alternatives to road transport and developing new maritime transport services.

The short sea shipping (SSS) alternative

Land transport is the most widely used means for intra-community goods transport, accounting for 76 % of freight and having recently further increased its share (Eurostat, 2011). Road haulage is still the fastest means and the one best adapted to « just-in-time » and door-to-door logistics. Various external costs must be factored in, however, including traffic jams, pollution, the number of accidents and highway maintenance. Account must also be taken of the increasing number of countries levying eco taxes, time restrictions on truck movements (driving and resting times for drivers are also strictly regulated) and even the euro-vignette. As trade between European countries has grown, the virtual monopoly held by truck transport has become a major problem for the community institutions. In order to reduce their costs, many member states are turning to other more socially effective and fuel-efficient alternatives.

One of the priorities of European transport policy is to balance the use of different modes of transport. Since the 2001[2] White Paper1, the EU has endeavoured to promote alternatives to road transport, encouraging rail and maritime modes with the aim of developing a cleaner, more sustainable and- in the

[2] On 12 September 2001 the Commission adopted the White Paper entitled "European transport policy for 2010: time to decide" (COM (2001 370)), to which should be added its revision in 'A mid-term review of the White paper entitled Keep Europe moving - sustainable mobility for our continent ' (COM (2006 314)).

long term- cheaper system. Over the last decade, the community institutions have launched a wide range of measures intended to render maritime transport and port activity more competitive. « Marco Polo II » (2007/2013) is the most important programme, promoting the development of container ship or roll-on roll-off shipping services, which are an alternative to land transport. Motorways of the Sea are also being developed under the Trans-European Transport Network, providing services with a minimum frequency of three runs per week and a maximum number of three ports of call. The Programme also plans the setting up of a public assistance scheme for the launch of new services which will guarantee its viability, be limited in time, and which should not exceed the amount deemed necessary for the launch. Subsidies may amount to up to 35 % of the total price, but may not be used to fund infrastructure. Road hauliers are finding themselves burdened by the rising cost of land transport (due to higher fuel prices and the introduction of new taxes levied for using the European road networks). SSS provides them with a multi-modal alternative to road, the potential of which has been analysed by various studies (García et al. 2010).

The Spanish ports with the widest provision of services and capacity (TEUs) in SSS services are Barcelona and Valencia, with 46 and 35 routes respectively for this type of service (Boletin 05 Line Port, January-June 2011). These two ports belong to the South-Western Motorway of the Sea. Whereas Valencia offers several advantages, including direct access to the areas of production, Barcelona is becoming established in maritime passenger transport, which means that she is able to provide an « offre de charge » for goods transport. The leader in this type of service is the Italian Grimaldi Group, providing two services from Valencia- one to Cagliari and Salerno, the other to Livorno. Three services are available from Barcelona: to Civitavecchia and Livorno in Italy and Tangier in Morocco. In Valencia, Grimaldi mainly loads trailers onto Ro-Ro vessels, whilst in Barcelona it loads trailers and entire trucks onto mixed Ro-Pax vessels (trucks and passengers). There are pros and cons to each of these systems. Loading a complete truck (including driver) costs the road haulier more but provides a dual benefit: the driver is directly responsible for loading and unloading (and is therefore not dependent on port dockers) and the truck is able to carry freight and containers on the return leg.

Despite the efforts made (Palao and Salinas, 2007), very limited results have been achieved with the introduction of SSS services in the port of Almería. It only has 3 SSS routes, and in 2010 the volume of goods handled totalled 53,451 tonnes. In some cases, efforts were curtailed earlier than planned and without success, as happened with the Van Uden company's Andalucia Fresh Line project, which was intended to ship horticultural products between the ports of Almería and Dunkirk in Northern France. A project known as Redymar is currently being run by Anecoop, the Almería Port Authority (APA), CETMO, Coexphal, J. Rono & Cia, López Guillén Logistics, Tecnova and the University of Almería. It aims to set up a network for the transport of perishable products from Almería to the Atlantic and Mediterranean coasts of Europe. A further project is being run by the Almería APA and the Almeriport Bay Foundation with the aim of setting up a route connecting to the United Kingdom.

Opportunities to optimise fruit and vegetable export logistics

Spanish fruit and vegetable exports need to develop alternatives to conventional road transport, particularly towards Europe. Relatively little progress has been made to date, however, in switching to other modes. Although on the face of it SSS is the most interesting option, results have unfortunately fallen short of expectations and planned growth potential. On the one hand, traffic lacks the flexibility and service provision needed to meet the demands of hauliers, exporters and the recipients of the goods. Very few projects qualify as MoS and the services provided cover only a tiny part of the sector's needs. On the other hand, land hauliers signing up to SSS can save on fuel and maintenance costs as well as downtime on the road. They must, however, complete customs procedures, despite these being community goods, as well as administrative formalities with the port authorities. They must also adapt to the inflexible service provided by the port workers, which is in the hands of monopolies, particularly where these companies are in charge of loading trailers.

Finally, it is difficult to implement the agreements established between ship owners, road hauliers and exporters to reach the minimum thresholds and frequencies needed to ensure that the logistics work. Changes in supply policy on the part of major chains (switching from weekly to daily orders) mean that land transport continues to be one of the most flexible means, particularly as the motorways of the sea are not yet operational 24/7.

Bibliography

- Compés R. y Baviera A. (2006). "*El transporte internacional de cítricos. Viabilidad del transporte marítimo de corta distancia*". Distribución y Consumo, Marzo-Abril, pp. 26- 32
- Barceló, L.V.; Compés, R. ; Garrigues, J. et Cortés, J. (1992). *El comercio marítimo valenciano de frutas y hortalizas*. Universidad Politécnica de Valencia.
- Cook, R.L. (1997). "*Tendencias internacionales en el sector de frutas y hortalizas frescas*". Economía Agraria, n.º 181, Septiembre-Diciembre 1997, pp. 183-208.
- Fundación Cajamar (2011). *Análisis de la campaña hortofrutícola de Almería. Campaña 2010/2011*, Fundación Cajamar.
- García Menéndez, L.; Feo, M.; Furió, S.; García-Luján, J.; Iborra, S. y Pérez, E. (2010). *Patrón modal y comercio con Europa: tendencias en el transporte de mercancías*. Fundación Valenciaport
- Palao, F. y Salinas, J. (2007). *Potencialidad del transporte hortofrutícola por el puerto de Almería*. Editorial Universidad de Almería.
- Trienekens, J. y Omta, S.W.F. (2002). *Paradoxes in food chains and networks*, Wageningen Universiteit. Management Studies Group

Brazilian exports to Algeria hampered by logistical constraints?

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Brazil has for several years now been consolidating her position amongst the leading global suppliers of commodities such as oilseed, cereals and meat. This South-American agricultural power is carving out an ever-increasing market share. Accounting for 2.8% of total global agricultural exports in 2000, by 2010 her sales had risen to 5%. The absolute value of Brazilian agricultural exports- which in 2000 amounted to no more than 15.5 billion dollars- has boomed over the last ten years, pushing 70 billion dollars in 2010, in other words a third of the country's total exports (WTO, 2011). This growth was confirmed in 2011, with Brazilian agro-food exports reaching almost 95 billion dollars, ranking the country third amongst global exporters.

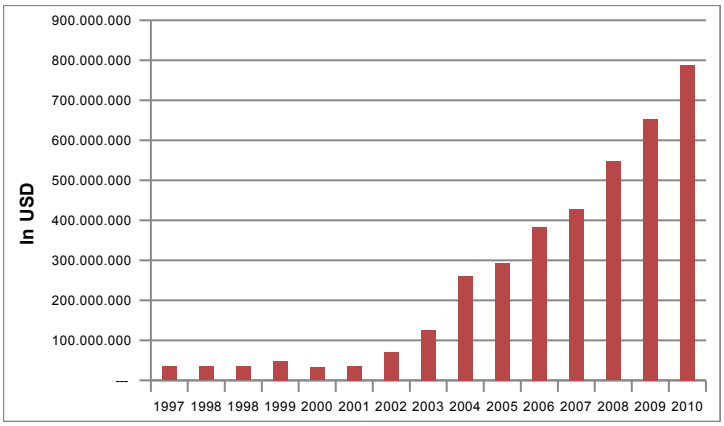
Algeria, meanwhile, is confirming her status as a major importer of agricultural and food products, diversifying her supply sources on an on-going basis. Brazil's gradual penetration of this domestic market as well as those of other neighbouring Arab countries thus comes as no surprise. The aim of this article is to question the limits of this relationship in respect of the logistical constraints present on the Algerian market.

Trends in Brazilian exports to Algeria

Since the early 2000s, Algeria's growing food imports have resulted in the emergence of new suppliers, also echoing the need to diversify supply sources as advocated by the government and operators in the agri-food sector. At the same time, Brazil has been intent on stimulating South-South cooperation and consolidating her economic presence in the Arab world (Abis, 2011; Brun, 2011). The revitalisation of the Global System of Trade Preferences (GSTP) through the 2004 Sao Paulo agreement recently also furthered this rapprochement, Algeria being one of the 43 member states (Mashayekhi and Ito, 2011). The agreement, which comes under the GATT (1994) enabling clause, authorises trade between developing countries under regional or global arrangements, with reductions or preferential exemptions on customs duties. These circumstances have therefore also been instrumental in helping Brazilian products to penetrate the Algerian market.

In 2011, Brazil ranked 9th amongst Algeria's suppliers across all products, with agricultural products accounting for 90% of Brazilian exports to this major North African destination. The main products imported from Brazil are sugar cane and beet, soya, meat and other meat-based products. From less than 50 million dollars on average in the late 1990s, Brazilian exports have since been on a constant upward curve, reaching almost 300 million dollars in 2005 and 790 million in 2010.

Trends in agri-food exports from Brazil to Algeria (1997-2010)



Source: compiled by S. Abis from AgroStat Brasil

Over the first six months of 2011, exports from Brazil amounted to a value of 840 million dollars, i.e. 17% of agricultural purchases made internationally by Algeria over the same period. These results for the first half of 2011 confirm that growth in agri-food sales from Brazil to Algeria is accelerating. With constantly increasing domestic needs that can only be met by the international market given the lack of adequate and reliable local production, food ranks third amongst Algeria's imports, amounting to around 10 billion dollars in 2011 according to statistics from the Algerian customs authorities and Ministry for Trade.

At the same time, broader State intervention in the importation of staple goods since the early 2000s has led to a sharp increase in purchases on the Brazilian market, a trend which expresses the government's support for the drive to intensify South-South cooperation. This has resulted in a steep rise for several raw materials of Brazilian origin, such as the soya imported by the National Office for Animal Feedstuffs (ONAB) and the frozen meat imported by the Meat Processing and Marketing Company (SOTRACOV).

Logistical constraints liable to hamper the process

Whilst international trade statistics illustrate the rapid rise of the South-American giant on the Algerian market, several parameters could well slow the current growth of Brazilian exports to Algeria.

This applies in particular to logistical issues arising from the distance between the two countries on the one hand and congestion within the Algerian ports on the other. These two factors alone add to the cost of transport. In any event, should these constraints persist Algerian foreign trade operators may gradually be prompted to make do with imports from markets closer to home.

Preference for local markets?

Between 2004 and 2009, imports from Brazil were boosted by the virtual monopoly held by the afore-mentioned public bodies (ONAB, OAIC and SOTRACOV), in response to the drive to intensify South-South cooperation. This trend, however, could well be reversed as a result of increasing domestic private intervention in foreign agri-food trading since 2010, the overriding concern of which is to cut transport costs. Given, for example, that 70% of Algeria's cereal imports come from the French market it stands to reason that private importers will only turn to distant suppliers such as Brazil for products not available in the Euro-Mediterranean region.

However, stricter regulation of the means of payment used in international trade following the 2009 Supplementary Finance Act could cause frozen meat imports to plummet (one of the main products imported from Brazil), whilst live bovine imports (not subject to tax and sourced on the European market) have recently been rising.

Rising transport costs?

The increased cost of shipping, driven by constantly spiralling fuel prices, is seriously undermining the surge in Brazilian exports to Algeria. The president of the Association of Algerian meat importers revealed in 2010, for example, that the average cost of freight shipping amounted to 7000 $ per vessel per day. Globally, these logistical-type constraints have become a major concern for international trade. The World Bank recently underscored that « preliminary evidence from ten Arab countries suggests that the combined costs of logistics are 36 dollars per ton for wheat » (World Bank, 2011).

Inadequate port infrastructure?

Cutting logistical costs is thus an overriding concern for Algerian importers. Yet port infrastructure in Algeria is lagging way behind in terms of upgrading and modernisation, generating additional and unavoidable costs for foreign trade operators and prompting them to avoid long-distance shipping wherever possible as the only means of cutting their logistics bill.

Indeed, out of fifteen or so ports along the Algerian coast (not including fishing ports), only five are classed as international commercial ports: Oran in the west of the country, Algiers in the centre and Béjaïa, Djendjen and Annaba in the east. Even in these ports, docking and freight unloading operations tend to be conducted in congested conditions, adding to the cost. A 2008 report described the Algerian ports as being « known for low productivity and long waiting periods (…) This lack of efficiency prevents Algeria from fully profiting from the 4.5% annual increase in maritime transport worldwide and means that the cost of freight to Algeria is one of the highest in the Mediterranean basin » (Oxford Business Group, 2008).

No significant improvements have been noted since 2008. Not until 2010 did the authorities, through SGP Sogeports, adopt a programme to modernise port infrastructure by creating multi-modal hubs in the Centre, East and West of the country, with connections to the rail and motorway networks. This should smooth the flow of transactions and facilitate the movement of goods from the coastal ports. These projects alone, however, will not suffice as long as other bureaucratic or customs obstacles persist in the short and medium term.

Conclusion

Despite the logistical constraints hampering intensification of her agri-food exports, Brazil remains a key supplier of agricultural products not available locally in Algeria or on neighbouring markets (European, Mediterranean, etc.), in particular oilseed, sugar and frozen meat. By way of illustration, the sugar processing industry which has been booming over recent years (20 million tonnes/yr on average) is supplied exclusively with imported raw materials, since sugar beet and cane are simply not cultivated. The raw materials for the processing of vegetable oils and the meat market (10% supplied by imports) are following the same trend.

Given this state of affairs, cutting the additional costs liable to hamper Brazil's agri- trade drive towards Algeria hinges on the will of both countries to set up compensatory mechanisms by, for example, reducing customs duties or creating free zones. Moreover, Algeria is being called upon to implement mechanisms to help curb the logistical constraints responsible for driving up the cost of products from this country.

The effective roll-out of the country's port infrastructure modernisation programme will cut the waiting time for freight in the ports, thereby reducing logistical costs. Customs legislation will nonetheless need to be relaxed in order to cut the red tape surrounding customs clearance procedures. To further consolidate their position on the Algerian market, Brazilian exporters would for their part be well advised to adopt a preferential price policy to offset the additional cost of transport, as is regularly demanded by the Algerian operators responsible for agri-food imports.

Bibliography

- Sébastien Abis, « *Brésil: une présence qui se confirme en Méditerranée* », Afkar-Ideas, n°29, Politica Exterior/IEMed, Avril 2011.
- Elodie Brun, « *Brésil-Maghreb, globalité nécessaire et enjeux économiques stratégiques* », Note de l'IFRI, Octobre 2011
- Mina Mashayekhi et Taisuke Ito, « *Le cycle de São Paulo du SGPC : une étape importante dans la coopération sud-sud* », Eclairage sur les Négociations, Vol. 10, n°09, International Centre for Trade and Sustainable Development (ICTSD), Décembre 2011.
- Oxford Business Group, « *Algérie : Restructuration des infrastructures portuaires* », 28 Septembre 2008.
- World Bank, *Food Price Watch*, April 2011.

Refrigerated Storage in Tunisia

Overview, Perspectives, Critical Points and Lessons Learned

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The development of many high-added-value agricultural activities requires use of a cold chain, either to preserve highly perishable products or because marketing under good conditions implies relatively long storage periods or because quality requirements on the target markets require temperature control during transport and storage. Refrigeration is also a vital factor paving the way from agriculture to become to the food industry.

Indeed, refrigeration reduces losses and maintains product quality, and makes it possible to absorb peaks and troughs at the production level, thus ensuring regular market supply of wholesome foodstuffs of a good quality. Refrigeration also makes it possible to add value to products and to provide farmers with higher and more regular income.

In order to fully benefit from the cold chain, it is essential to comply with a certain number of conditions. The example of refrigerated storage in Tunisia is highly instructive for the entire cold chain throughout the Mediterranean area.

Refrigerated Storage in Tunisia

This activity is of strategic importance to the Tunisian economy. Indeed, it plays an essential role in the field of food security and safety in Tunisia and contributes to the development of Tunisia's industrial fabric. In Tunisia, the use of refrigerated storage technology for fresh farm products dates back to the early 1960s and started expanding fast during the 1990s. Over 60% of refrigerated warehouses are less than 10 years old. Tunisia's cold storage capacity was 1300 m3 in 1967, 512 000 m^3 in 1996 then reached 1 500 000 m^3 in 2010, of which 1 250 000 m^3 was for chilled foodstuffs (temperature above 0°C) and 250 000 m^3 for frozen foodstuffs (temperature below 0°C). 77% of refrigerated warehouses have a capacity of more than 1000 m^3 and 41% have a capacity of over 3000 m^3.

This evolution is the result of strategy adopted by the Tunisian government in order to expand agricultural production and exports, thanks to better management of storage and distribution circuits. In this manner, the government promotes investment: land can be purchased at a reduced price (this reduction can be as high as 75%) and an investment premium of up to 25 to 30% is available, depending on the geographical location (regional developmental zones), and tax benefits are also available: exemption from customs duties, VAT exemption, tax exemption…

The total cold storage capacity is divided up into about 900 facilities comprising individual refrigerated warehouses and warehouses integrated into food processing units (e.g. dairies, ice-cream manufacturers, seafood freezing units, prepared food manufacturing units, fruit freezing plants, meat processing plants, etc.). 87% of cold stores are private, and the remaining 13% are public. Over 70% of this capacity (i.e. about 1 100 000 m^3) is used to store fruit and vegetables (above all dates, apples and pears, peaches, pomegranate, citrus fruit, potatoes). This 1 100 000 m^3 capacity is divided up into about 580 facilities (330 cold stores used for fruit and 250 cold stores used for vegetables) with 1 072 000 m^3 devoted to chilled foodstuffs (temperature above 0°C), and 28 000 m^3 to frozen foodstuffs (temperature below 0°C). The rest of this cold storage capacity (around 400 000 m^3), comprises about 320 facilities and is used for seafoods (14% of the total capacity), red and white meats (5.5%), milk and milk products (4.5%), ices and ice cream (3%) and various other products such as eggs, yeasts, etc. (3%).

The cold chain and external trade

The export sectors must comply with strict and rigorous specifications and systematic inspection conducted by commissions in charge of technical approval. Tunisia's main chilled or frozen food are: dates, seafood, citrus fruit, other fruit and vegetables and cheeses. Average production levels exported per year in chilled form over the past 5 years (2007-2011) are as follows:

- Dates: 80 000 tonnes, this being roughly half of total production
- Seafood: 20 000 tonnes, this being one-fifth of total production
- Oranges ("Valencia late" and "Maltese late"): 24 000 tonnes, i.e. 40% of all production of these varieties (which are the only oranges grown in Tunisia that are suitable for refrigerated storage). Total citrus fruit production is 350 000 tonnes.
- Potatoes: 14 000 tonnes of seasonal potatoes (Tunisia produces 180 000 tonnes); late and early production, of the same volume, are not usually stored using refrigerated storage; potatoes are considered as one of the main vegetable crops in Tunisia, in terms of land use and tonnes produced.
- Other fruit and vegetables (tomatoes, artichokes, strawberries, etc.): 32 500 tonnes.
- Cheeses: 9000 tonnes.

In terms of value, the main products benefiting from refrigerated storage prior to export are: seafood (51%) and dates (35%). Most chilled fish exports go to Greece. 90% of frozen seafood products are exported to Spain and Italy. The main markets for exported fruit and vegetables are the EU (France, Italy, Germany, United Kingdom, Belgium, Spain), Morocco and Saudi Arabia.

Concerning imports, the main products are fruit and vegetables: 87 900 tonnes, including 43 000 tonnes of potatoes for human consumption and seed potatoes and 32 400 tonnes of bananas; seafood (28 000 tonnes), dairy products and bovine red meat: 5000 tonnes (cf. a national production level of 55 500 tonnes; Tunisia also produces 49 500 tonnes of sheepmeat and 9000 tonnes of goatmeat). These products come above all from Maghreb countries, the EU and Sub-Saharan Africa.

Problems encountered in the refrigerated storage sector

In Tunisia, the refrigerated storage sector is faced with several handicaps:

- In general terms, the use rate with respect to storage capacities for fruit and vegetables is less than 60%. This situation is due to the seasonal nature of most products, and is also due to the fact that agricultural production depends on rainfall; insufficient supply levels in the case of certain products is also a problem. A lack of know-how at the level of the operators of most fruit and vegetable packing stations and a lack of additional equipment (equipment for sorting, grading and handling, etc.) is another factor affecting the proper functioning of these facilities, although this does not apply to exported date, citrus-fruit and early produce: these facilities are well-structured and equipped with sorting, grading, handling, and packing equipment as well as analytical and quality control laboratories;
- Poor selection of equipment, incorrectly sized refrigeration systems and systems that do not meet technical standards, leading to excessive electrical energy consumption and higher operating costs;
- Poor technical support within the sector and the lack of a trade organization seem to exert a negative effect on the technical capability of the sector;
- In the field of maintenance of refrigeration equipment, skilled labour is in short supply;
- Poor knowledge of optimal (nominal) refrigerated storage conditions, particularly for fruit and vegetables;
- Individual cold storage facilities used for local markets are in most cases designed and operated in a manner that does not necessarily comply with national standards and regulations and tends not to take into account the specific nature of each product. These practices exert an impact on the quality of products following storage: losses of products can be as high as 17%. Besides, the quality of stored products is poor, once removed from the cold storage facility, the shelf life of the products is very short, and products that are "kept in fridges" or frozen tend to have a negative image.
- Application of hygienic conditions tends to be poor and refrigeration traceability and application of the HACCP approach tend to be lacking; this exerts direct effects on the quality and safety of stored products,
- Refrigerated storage capacity at temperatures below 0°C (freezing and deep-freezing) of fruit, vegetables and meats is insufficient;
- In Tunisia, refrigerated storage facilities consume 3 to 4 times more electricity than such facilities in Western countries, and this places a major burden on the National Compensation Fund in the energy field; a great deal could be achieved by applying current regulations, and by implementing action plans

dealing with improvements in energy efficiency in this sector, in particular through the setting up of energy auditing projects designed for cold stores.

The export networks, faced with customer pressure, have in most cases adopted relatively modern management tools, along with technology of a practically international standard, and feature management and a core group of permanent staff. By contrast, cold stores catering for the needs of local markets, with the exception of those comprising food processing units (which are setting up upgrading and quality programmes), are simply storage buildings with a couple of persons in charge of all aspects (management, purchases and rentals, etc.).

Major growth perspectives are opening up in this sector (development and exports of fresh produce, production of fruit and vegetables and prepared foods, etc.). However, the setting up of an inter-professional organization (national committee, inter-professional union or a similar organization) is strongly recommended. Such an organization would be in charge of the following:

- examination of technical, economic and financial issues related to refrigeration and the use of refrigeration;
- analysis of measures related to the cold chain and putting forward of proposals concerning the development of the cold chain;
- putting forward of proposals and monitoring of the sector in terms of labour law, customs tariffs, environmental protection and quality standards, along with vigilance with respect to domestic and international markets.

General comments

The case of Tunisia demonstrates that motivated and federated stakeholders (individually and collectively) can readily master and develop the cold chain. A trade organization can help stakeholders working in various fields to have an overall vision of the market and market trends and can thus develop capacity (production and storage, etc.) taking into account the needs and capacities of their partners. This also applies to training schemes.

The fact that the Tunisian government has been subsidizing the cold chain for many years is also a determining factor in the launching and structuring of networks. Training, awareness raising, regulations and controls are also major aspects. The other points underscored in the case of Tunisia also apply to other countries.

Selection and sizing of refrigeration systems

Obviously, overcapacity raises investment and running costs in the storage field (maintenance, energy consumption…). However, it is not the only issue to be addressed: the design of refrigeration systems must take into account the atmospheric conditions in the geographical area of the facilities.

On one hand, the size (and the cost) of refrigeration systems and energy consumption can be reduced significantly by employing the following:

- evaporative pre-cooling and evaporative condensers, particularly in hot, dry climates, provided that sufficient water of a suitable quality is available;
- thermal storage, where refrigeration demand varies considerably throughout the day (particularly in the dairy industry) or where the diurnal temperature range is high.

On the other hand, energy efficiency can be significantly reduced when equipment is not operated under the conditions for which it was designed.

For these reasons, an in-depth technical and financial forecast should be made by a specialized refrigeration engineer. Finally, selection of equipment must take into account the availability (or not) of a network of suitably skilled repairers sufficiently close to the site.

Skilled workers for maintenance and management of equipment

This issue is often encountered. Raising of the awareness of staff in charge of transport and handling of products is another frequently encountered issue. In industrial refrigeration, the staff handling maintenance and management of equipment must receive suitable initial and ongoing training.

Conversely, persons managing refrigeration plants must be made aware of the savings (in terms of equipment lifespan and energy efficiency, and also at the level of the shelf life of products along with product quality following storage, etc.) they can achieve once the staff have been well-trained.

Concerning food quality, it should be borne in mind that chilled products (unfrozen) must be preserved within specific temperature ranges with a specific maximum and a specific minimum temperature for each product; temperature abuse shortens the shelf life and can pose health risks, whereas a temperature that is too low can cause deterioration: e.g. chilling injury in many varieties of fruit and vegetables, damage to cell walls in the case of uncontrolled freezing. Also, the relative humidity of the air inside the cold store must remain fairly high in order to prevent drying, but must not induce growth of moulds or pathogens. Lastly, for fruit and vegetables, which have living tissues in which metabolic process continue to take place, controlled atmosphere (control of oxygen, nitrogen, carbon dioxide, and ethylene levels for certain fruit), is a major adjunct to the cold chain per se. It is important to ensure that warehouse managers are familiar with these rules and know how to apply them at all times throughout the entire storage zone.

The quality of products upon arrival as the cold store

The quality of plant products entering the cold chain is a determining factor in the preservation of such foodstuffs. Wilting or mechanical damage, harvesting at the wrong time, or even mineral or nutrient deficiencies exert negative effects on the shelf life, can affect organoleptic characteristics and can even cause accelerated deterioration of the products. As for products of animal origin, failure to comply with hygiene standards (in particular, bacteriological and temperature control standards) can cause serious public-health problems. Training, traceability and controls are thus indispensable, as is the continuity of the cold chain.

Bibliography

- "*Etude de Positionnement de la Branche Entreposage frigorifique*", Ministère tunisien de l'Industrie, 2006.
- "*The current status of refrigerated storage capacity in Tunisia*", Tunisien Ministry of Industry, 2008 (in Arabic).
- *Budget économique 2011*, Ministère tunisien de l'agriculture
- *Annuaire des statistiques 2011*, Ministère tunisien de l'agriculture
- *Statistiques 2011*, Direction Générale du Commerce Extérieur de la Tunisie
- *Cours de formation sur « La conservation frigorifique des fruits et légumes »*, Institut International du Froid, 2004.
- International Institute of Refrigeration, "The Cold Chain, Food Security and Economic development", CIHEAM, Analytical note n°74, march 2011 (also available on www.iifiir.org)

Milk: a key sector in the Tunisian agrifood chain

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The Tunisian dairy sector is of strategic importance, given its impact on food security and its socio-economic role. The factors driving the sector are not only economic but also social and political, so it could be said that the Tunisian dairy sector is a "social" production system. The rapid development of dairy production has been encouraged by periodic changes in production costs, the allocation of subsidies for the collection of milk and the establishment of a network of collection centres in production areas. However, the seasonal nature of milk production is currently a source of problems for all operators in the sector since it affects both the quantity and quality of raw milk and the different dairy products.

Policy on milk production

Tunisia has tried two approaches: following an initial policy of promoting the use of imported dried milk powder, a second policy encouraging production and collection of local milk was adopted (Bourbouze, 2003). The latter had several objectives: to improve the genetic merit of the stock through the import of Holstein heifers and introduce measures to develop the fodder break as an essential means of developing milk production, to establish a network of collection centres, to foster the rise of an active dairy products industry and to put in place a prices policy together with import controls. Since December 2008 the state has been laying down hygiene and quality standards for production equipment and techniques and creating the conditions required if health approval is to be granted.

Economic considerations

Milk is the second most important product of livestock farming after meat and the dairy sector is the most important of the agro-industrial complex. Moreover, the dairy industry accounts for 9% of all employment in the Tunisian food sector (Ministry for Industry and Technology, 2010). Milk output and the dairy industries in general suffer from numerous economic and structural weaknesses, due in particular to the vulnerability of the production and collection systems. From the economic standpoint the livestock sector contributes 38.6% to the total value of agricultural output and the dairy sector accounts for 26% of the total value of animal production (Ministry of Agriculture and Hydraulic Resources, 2010). In 2010 livestock farming's contribution to the added value of the agricultural sector was as high as 15%. It benefited from massive investment (173 million dinars), amounting to an increase of 13%. It also enjoyed public subsidies (20 million dinars/year). But despite these advantages the sector is still weak, owing in particular to poor coordination between operators (breeders, collectors and manufacturers).

Changes in size and genetic structure of the herd

In Tunisia cattle rearing is an important part of the agricultural production system and the national economy as a whole. It has been classified as a priority sector on the grounds that it produces two strategic products (milk and meat). In 2010 the herd comprised a total of 440,000 females, of which 223,000 were purebred and 217,000 were local or crossbred. We are seeing an alarming decrease in the size of the dairy herd whose annual growth rate is in the region of -0.86% and whose numbers fell from 482,000 in 2000 to 440,000 in 2010.

Table 1 - Changes in Tunisia's bovine dairy herd per 1000 females

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Pure bred	204	211	215	211	195	205	215	223	220	220	223
Local bred and Crossbred	279	273	276	255	241	239	234	231	229	220	217
Total	**482**	**484**	**491**	**465**	**435**	**444**	**450**	**454**	**449**	**440**	**440**

Source: DGEDA, 2011

The majority of dairy cows are kept by small breeders, which explains the importance of small farms for milk production and the need to develop a collection network that is as extensive and as close to the breeders as possible.

Table 2 - Distribution of cows by size of farm and size of herd (%) (%)

		Size of farm (Ha)					
		5	5-10	10-50	50-100	100	Total
Size of herd (head)	1-3	24,6	9,5	10,3	0,7	0,3	45,4
	4-10	10,7	8,1	13,9	2,2	1	35,9
	11-20	0,9	1,1	3,8	0,8	1,1	7,7
	21-50	0,2	0,6	1,2	0,7	1,4	4,1
	51-100	-	-	0,4	0,1	1,3	1,8
	+100	-	-	-	-	5,1	5,1
Total		**36,4**	**19,3**	**29,6**	**4,5**	**10,2**	**100**

Source: GIVLAIT, 2009

Production

Over 95% of milk is produced by the cattle herd (less than 5% being provided by the sheep and goat herds). Despite the fodder deficit, aggravated by successive years of drought and falling numbers of cattle, production has made remarkable headway following the introduction of a series of incentives extended to all parts of the chain and intended to ensure self-sufficiency. And indeed, production has increased annually by nearly 1.65%, rising from 908,000 tonnes in 2000 to 1,088,000 tonnes in 2011.

Table 3 - Growth in milk output between 2000 and 2011 (thousands of tonnes)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Output	908	916	940	891	864	920	971	1006	1014	1030	1059	1088

Source: DGEDA, 2012

Collection

Milk collection is an important stage in the production process. The collection network has a vital role in extending the producers' markets and providing them with services. At present there are 235 centres in operation, 188 of which have already obtained health certification while the others have begun to introduce the necessary improvements in order to obtain certification (GIVLAIT, 2010). The amount of milk collected is around 59% of total output and the central dairy plants obtain 85% of their supplies from the collection centres (GIVLAIT, 2011). The quality of the milk delivered is determined by the state and characteristics (capacity for cooling and analysing, transport conditions, etc.) of the dairy equipment and by the expertise of the staff (GIVLAIT, 2011). This link in the chain is still a serious impediment to the operation of the sector as a whole given its many shortcomings:

- lack of organisation and transparency: 40% of output is sold unprocessed and in bulk to buyers outside the normal industrial channels;
- sale of output to small itinerant tradesmen because industrial channels are not very profitable, which means that there can be no traceability and no guarantee of hygiene or quality.

Around 60 agricultural services cooperatives (ASCs) manage the collection centres, which take milk both from their own members and from other producers in the area served by the ASC. The amount of milk collected rose from 444 million litres in 2000 to 599 million litres in 2009, which amounts to an average annual growth rate of around 3.5%. Since 1983 the state has been paying producers a bonus through the Caisse Générale de Compensation (CGC), which is equal to 20% of the price they are paid. The authorities have also taken steps to ensure that this bonus, designed to encourage collection of milk, is periodically revised. It rose from 15 millimes in 1983 to 20 in 1987, 25 in 1991, 35 in 1992 and 40 in 1994.

Table 4 - Increase in milk collection (millions of litres)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Milk collected	444	469	485	458	483	517	560	579	589	599

Source: DGEDA, 2010

Growth in demand and consumption

Per capita consumption of milk and dairy products rose from 83 litres in 1994 to 110 litres in 2010 (GIVLAIT, 2011). This level may seem low (68 litres/person/year) but is actually about average for the region. The corresponding figures for Morocco and Algeria are 38 litres and 95 litres respectively. According to Kayouli (2008), per capita consumption of UHT milk rose significantly in 2007, almost by 10%, mainly on account of the increase in the number of visitors to Tunisia, particularly from neighbouring countries (nearly 6.8 million in all, of whom 2.4 million were from Libya and Algeria), where dairy products are a traditional part of the diet.

Industry and distribution system

The dairy industry has been booming over the past 15 years, with an annual growth rate of more than 13%, due mainly to the establishment of a collection network. Thirteen central dairy plants have been set up, the largest of which is in Cap-Bon (CLC-Délice). Milk processing is carried out mainly in the north of the country, although the geographical coverage of the industrial dairy network has been increased by the emergence of new milk producing zones, which produce both drinking milk and its derivatives and mainly engage in landless livestock farming (Mahdia Sfax and Le Sahel). In 2011 the network of processing plants comprised 44 industrial units with a capacity of 2,860 million litres per day, thus indicating that the industrial dairy network had indeed extended to encompass these emerging production zones. Central dairy plants are also found in areas with a strong dairy tradition such as Béja (the Vaga plant) or in regions located at some distance from the major centres of consumption (the Sers plant).

The amount of milk absorbed by industrial producers has increased by a factor of 1.5 in 10 years, rising from 487 million litres in 2000 to 680 million in 2009. Furthermore, the amount used to make yoghurt and cheese has increased steadily, rising from 95 to 155 and 73 to 125 million litres respectively between 2000 and 2009, to the detriment of milk intended for drinking. The drinking milk industry has around 75% of the total capacity of the country's milk industry, ie 1.7 million litres per day (more than 62% of the fresh milk collected). While the production of drinking milk increased between 2000 and 2009, the potential capacity of the central milk plants is still underused, bearing in mind that the level of delivery to industries remains fairly low, at around 52% of output.

Table 5 - Changes in production of processed milk products (millions of litres)

Year	UHT milk	Yogurt	Cheese
2000	319	95	73
2001	309	96	75
2002	334	104	81
2003	312	97	80
2004	336	100	83
2005	347	112	85
2006	360	125	95
2007	378	140	110
2008	419	144	116
2009	400	155	125

Source: DGEDA, 2010

The milk distribution and marketing channels for small farmers are not well known and are poorly identified. About a third of the output from these producers is not even distributed through organised channels, which means that there is a lack of coordination between the different parts of the sector, namely the producers, the collection centres and the industries. Furthermore, seasonal variation in production and consumption and the involvement of itinerant dealers encourage speculation in terms of prices and quality. It is nevertheless possible to distinguish three main types of channel: the informal ones that provide for home consumption and/or local consumption of raw milk; the formal ones used for organised trade in industrial milk; and the emerging ones that have to do with the liberalisation of the economy.

Conclusion

The Tunisian dairy sector comprises numerous small producers (112,000 livestock farmers), a few hundred collection centres and about ten industrial producers. Milk production and the dairy industries suffer from many economic and structural shortcomings, due in particular to the weaknesses of the production and collection arrangements. An interprofessional organisation should bring together these three parts of the dairy industry and enable the different areas of the sector to defend their interests. While organising the industrialists and collectors in the milk sector appears to be a simple matter, organising the livestock farmers proves to be much more complicated. The future of the Tunisian dairy sector is bound up with this problem: there can be no sustainable development of the sector without the participation of each part of it, above all that of the small-scale producers.

Bibliography

- A. Bourbouze, « *Le développement des filières lait au Maghreb* », Conférence donnée à Agropolis Museum, Montpellier, le 5 Mars 2003.
- Ministère de l'Agriculture et des ressources Hydrique (MARH), Direction générale des études et du développement agricole (DGEDA), *Rapport d'activité 2010*, Tunis, 2011.
- Ministère de l'Agriculture et des ressources Hydrique (MARH), Direction générale des études et du développement agricole (DGEDA), *Rapport d'activité 2011*, Tunis, 2012.
- Groupement Inter-Professionnel des Viandes Rouges et du lait (GIVLAIT), *Rapport d'activité 2009*, Tunis. 2010.
- Groupement Inter-Professionnel des Viandes Rouges et du lait (GIVLAIT), *Rapport d'activité 2010*, Tunis, 2011.
- C. Kayouli, « *Comment Pérenniser les acquis du secteur bovin laitier en Tunisie ? Diagnostic et propositions d'actions pratiques* », janvier 2008.
- Ministère de l'Agriculture et des ressources Hydrique (MARH), *Rapport annuel 2010*, Tunis, 2010.
- Ministère de l'Industrie et de la Technologie (MIT), M*onographie sur les Industries Agroalimentaires en Tunisie*, Tunis.

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Interview

Tarek Tawfiq

Former President of the Egyptian Chamber of Food Industries, Union of Egyptian Industries

Q: What place do local agricultural and agri-food products occupy in the Egyptian economy?

Activities directly or indirectly connected with the agricultural and agri-food sector in Egypt account for some 17% of Egyptian economic output. This shows the ever-growing importance of the sector, especially given that the country is faced with the problem of food insecurity and that food imports outstrip food exports by about 30 billion Egyptian pounds (EGP). Annual exports of food amount to 27 billion EGP, while food imports are almost 60 billion EGP. Furthermore, the agricultural and agri-food sector plays a crucial role in the labour market which, directly or indirectly, absorbs over half the active labour force in Egypt.

Q: What are the major problems in transport logistics for agriculture and the agri-food industry in Egypt?

You cannot generalise about this question. On the contrary, you need to treat it with considerable caution because in Egypt we are often faced with two diametrically opposite situations. Some sectors are organised to some degree but in others nothing has changed for a hundred years. Be that as it may, the wastage of agricultural products due to inadequate transport facilities presents a real logistical problem. According to official statistics, 15 to 20% of crops harvested are lost or wasted. Worse still, in the fresh fruit and vegetables sector, losses related to transport and storage range from 25 to 50% of the harvest. Although I should point out that the production and marketing chains for food exports have improved enormously over the last ten years. On the other hand, food products for the local market suffer from several shortcomings, especially the lack of modern river transport and retail outlets to meet the required standards. In this regard, I should explain that the vast majority of these outlets are in the informal sector.

Q: What about problems of storage and conservation of products destined for local consumption?

We have been pleased to note, over the last ten years, a real improvement in conservation systems for agri-food products with the proliferation of cold stores. Unfortunately, this does not extend to retail outlets, where the problem of the cold chain is still a worry. We cannot say it too often: food products for the local market come up against a number of hurdles, among them storage and conservation. They need investment, especially in silos. Commendable efforts have been made in this direction in the last few years, but it is still not enough. Large quantities of cereals are still stored in the open and are thus prone to substantial wastage due to the vagaries of climate, rodents and other factors.

Q: To what extent is health and food safety a problem in relation to food products?

This presents us with a real problem, one with multiple dimensions. The question concerns regulatory, legal and organisational aspects, all at the same time, not to mention, of course, the health aspect itself. To give an idea of the difficulties we face in this regard, you need to know that at least seven ministries are responsible for dealing with the question and that there are more than fifteen control bodies. Some might see in them the existence of a strong system devoted to food security in terms of health. That is far from the case. Of course, the premises for such a system do exist in Egypt, but it is not working in practice. That is why civil society organisations have been demanding for six years the introduction of a bill which clearly and efficiently governs the work of an agency responsible for food safety. We recently managed to persuade the Essam Sharaf Government in 2011 to take this demand on board. The bill has not so far been adopted by the Supreme Council of the Armed Forces. However, I am confident that it has a very good chance of being adopted in the next parliament following the first legislative elections in the transitional period, and that the question of food safety will be a core priority of the next legislature.

Q: What is the attitude of farmers, industrialists in the agri-food sector and consumers to questions of food safety?

This is a highly complex problem. In this respect, however, we can discern the outlines of two sectors: one which is trying, despite all the difficulties, to organise itself to meet quality requirements and the informal sector, which has its own rules and which develops out of sight, and is thus independent of any

strict quality control system. Having said that, the judgement varies from one product to another. In the dairy sector, for example, 20% of production, conservation and distribution chains observe strict quality standards. However, there are question marks over health standards in informal chains as a whole, in other words, the other 80%. As far as agriculture is concerned, about a third of the chains in the sector are well organised, and the remaining two thirds are in the informal sector, thus outside any reliable control system. Moreover, it should be emphasised here that almost the entire sugar industry is organised, while that is true of only 70% of the oils industry.

Q: What, above all, do Egyptian exporters of agricultural and agri-food products need to improve quality?

Despite tangible progress, this sector is still handicapped by bureaucracy. That is why it is high time for the Government to tackle the problem and review the organisational and legal framework of the production, conservation and distribution of all consumer food products for foreign and domestic markets and enhance the value of agricultural and agri-food products. This requirement should also be incorporated in the general framework of food safety. Problems should not be addressed on a case by case basis and in an incomplete way. At the same time, other equally important measures need to be taken, such as:

- implementing mechanisms to encourage investment in newly reclaimed land and farm it properly;
- challenging current irrigation systems, in particular improving those used in traditional farming and ensuring that they match up to the farming practices introduced in the newly reclaimed land in the arid regions;
- developing Egyptian farming laws and including them in international intellectual property instruments;
- promoting practical scientific research which can meet the needs of the agricultural and industrial sectors;
- implementing the Act on the Food Safety Agency, and reviewing all current legislative instruments with a view to consolidating them;
- embarking without delay on the development of the retail sector, which is still the most backward;
- lastly, ensuring the emergence of a culture in which all operators sign up to an ethos of quality and food safety, wherever the products are destined.

Q: Could you think of a few lessons drawn from the experience of the Mediterranean or other countries which could assist Egyptian operators in improving the efficiency and sustainability of agri-food logistics?

In the first place, Egypt needs, more than ever, a total reinvigoration of agricultural investment, especially in agricultural inputs which at present are less than 10% compared with 40% in other countries. This is all the more vital considering that Egypt suffers from a dual handicap: massive imports of agricultural products and colossal wastage of local products. I must also stress another point: to be effective, logistics must be utilised in the broad sense, covering everything from the farm to the dinner table. To do this, the top priority must be, on the one hand, the production, conservation and distribution strategies to preserve resources and minimise losses, and on the other, ensuring better yields and better quality.

It is thus in our interest, for example, to draw on the experience of other countries of transporting food products by river, especially to reduce production costs and wastage. The problem of transport is particularly acute in Egypt with regard to workers in factories producing agri-food products. There is an urgent need to review current laws which prohibit the establishment of these factories on farmland, or the establishment of several of them outside the areas where the raw materials are produced. Taking this approach, bringing processing areas closer to production areas, means satisfying another need: to improve on-site storage and conservation facilities. The same goes for the premises which we need to improve to accommodate local retail outlets. The Dutch example is very instructive in this regard. There, the development of this sector has enhanced the organisation and performance of all the country's agricultural and agri-food industries. By taking their inspiration from this example, the Egyptian State and industry organisations will be buying a winning ticket for all concerned, opening up new prospects for every product, every farmer, every industrialist and every consumer.

Interview by Hassane Tlili

Journalist specialising in agricultural and environmental issues

Activities of our Institutes

MAI Bari

Forum on sustainable fishing in the Mediterranean

MAI Bari was charged by the Italian Ministry of Agricultural, Food and Forestry Policies (MIPAAF) to organise an international meeting devoted to Mediterranean fishing. The meeting, entitled "Reflections on further reform of the EU Common Fisheries Policy", was held at MAI Bari on 2 December 2011 and brought together delegates from the agriculture and fisheries ministries of several Mediterranean countries (Albania, Algeria, Egypt, Lebanon, Morocco, Montenegro, Tunisia, Turkey and Italy), together with institutional delegates from the European Parliament, the European Commission, the General Fisheries Commission for the Mediterranean (GFCM), and associations from the Mediterranean fisheries sector.

Discussion focussed in particular on the sustainability of the fishing sector in the Mediterranean zone and the need to initiate a regional dialogue on the EU's new Common Fisheries Policy (CFP), particular account being taken of specific environmental and marine conditions in the different Mediterranean countries as well as the socio-economic and cultural characteristics of the Mediterranean Region as a whole.

Like the promotion of measures to diversify economic activity, the adoption of measures designed to protect fish stocks calls for the building of a broad political consensus in the region. To that end delegations from the Mediterranean countries, sectoral associations, the GFCM and MAI Bari have agreed to enhance the dialogue between Mediterranean countries through cooperation and educational activities relating to the environmental and socio-economic sustainability of the Mediterranean fisheries sector.

Seminar on the Sustainability of the Mediterranean Diet

On 28 and 29 November 2011, an international seminar to establish "guidelines for the sustainability of the Mediterranean Diet" was organised at MAI Bari with the support of the Italian Ministry for Foreign Affairs. About 30 international experts were at the meeting, which was also attended by interns from various countries around the Mediterranean rim, who were following the institute's professional training courses on sustainable agriculture.

Thanks to the multidisciplinary, intersectoral discussion at the seminar it was possible to identify 70 food-production and consumption indicators, which fell into four broad strategic fields: environment and natural resources (including agro-biodiversity); economics; society and culture; and nutrition, health and life style.

Participants also decided to set up a Task Force to address the indicators thus identified and open it up to all organisations and institutions that were sympathetic to the initiative and willing to engage in the process of assessing the sustainability of the Mediterranean diet and agrifood system. MAI Bari has therefore set up a secretariat to coordinate the Task Force, whose work and initial findings might be presented in September 2012 in Valletta on the occasion of an international seminar organised with the Maltese authorities. This seminar will take place ahead of the 9th meeting of the CIHEAM member countries' ministers of agriculture.

Activities of our Institutes

MAI Chania

Continent-wide response of mountain vegetation to climate change

The MAI Chania contributed to a very important scientific publication which was published on-line on 10th of January 2012 in the journal "Nature Climate Change" entitled "Continent-wide response of mountain vegetation to climate change" (co-authors Mr. George Kazakis and Dr. Ioannis Vogiatzakis). The participation in this publication was the result of the persistent and continuous effort of the MAI-Chania's scientists who participated initially in the GLORIA project and subsequently supported actively the created scientific international network. This publication reflects the ongoing commitment of the Institute to high standards in tertiary education and scientific research. The study area of MAI-Chania was four summits on the Lefka Ori massif of Crete along an altitude gradient from 1664 to 2339 m altitude. The GLORIA multi-summit approach was used to provide vegetation and floristic data together with soil temperature records for every summit.

Climate change is having a more profound effect on alpine vegetation than at first anticipated, according to the study. The first ever pan-European study of changing mountain vegetation has found that some alpine meadows could disappear within the next few decades. Led by researchers from the Austrian Academy of Sciences and the University of Vienna, scientists from 13 different countries in Europe analysed 867 vegetation samples from 60 different summits sited in all major European mountain systems, first in 2001 and then again just seven years later in 2008. They found strong indications that, at a continental scale, cold-loving plants traditionally found in alpine regions are being pushed out of many habitats by warm-loving plants. The GLORIA programme (Global Observation Research Initiative in Alpine Environments) is a network of more than 100 research teams distributed over six continents whose aim it is to monitor all alpine regions across the globe. Launched in 2001, it has implemented a long-term and standardised approach to the observation of alpine vegetation and its response to climate change. The second project meeting with more than 100 participants was held at the premises of MAI-Chania in April 2003.

Extended Erasmus University Charter

MAI-Chania has been awarded an Extended Erasmus University Charter until the academic year 2013/2014. MAI-Chania had submitted an application for the Erasmus University Charter (EUC) in the framework of the Lifelong Learning Programme call for proposals, selections year 2012, for which the Executive Agency received a total of 535 applications. Following the evaluation of MAI-Chania's EUC application, with the assistance of independent experts, MAI-Chania was awarded the Extended Erasmus University Charter (Standard Charter and student placements) until the academic year 2013/2014.

MAI-Chania is already holder of the Standard Erasmus University Charter and had been awarded the Extended Erasmus University Charter (Student placements only) under the EUC selections 2012.The Extended Erasmus University Charter entitles MAI-Chania to participate in decentralized Erasmus activities (by contacting the National Agency) as well as to act as an applicant organization in Erasmus centralized action (multilateral projects, networks and accompanying measures) managed by the Executive agency. This is a great achievement for MAI Chania and reflects the ongoing commitment of the CIHEAM to high standards and academic excellency.

Activities of our Institutes

MAI Montpellier

Programme ENPARD

Under the revamped European Neighbourhood Policy (ENP), whose guidance document came out in May 2011, the European Commission has decided to implement a programme entitled "European Neighbourhood Programme for Agriculture and Rural Development" (ENPARD), which is designed to support rural development in Mediterranean countries. Initial work will concentrate on four countries: Morocco, Tunisia, Egypt and Jordan. The EC's Development and Co-operation Directorate-General (DG DEVCO) has made CIHEAM-MAI Montpellier responsible for the operation for the period January 2012 to June 2014.

A pluriannual work programme will be set up in association with national partners and will be organised around two main themes:

- improving local food security and rural development models with a view to supporting sustainable agricultural productivity, diversifying the rural economy and helping local community and civil society institutions in rural areas;
- Improving productivity and quality standards by helping create an environment in which land and market regulations can be satisfied, ensuring modernisation of infrastructure and logistics designed to support production, investing in procedures for the processing and marketing of agricultural products that meet guaranteed quality standards.

An initial phase of the programme, during which the scope and operational organisation of the activities will be determined, is due to be followed by a second phase, beginning in July 2012, which will consist in setting up discussion and training workshops to aid national and regional policy-making in the field of agricultural and rural development.

Information on this programme: dolle@iamm.fr

ILLIAD

MAI Montpellier and INRA are coordinating a programme for France's ANR (National Research Agency), which will be devoted to ILLIAD (Local or Localised Initiatives for Sustainable Food). The programme began in January 2012 and will last four years. It will accordingly cover four production seasons, thus limiting climate risks, and will involve a multidisciplinary consortium providing a range of scientific and technical skills.

The sustainability of the food sectors has been called into question both by public authorities and by consumers who are now inclined to support alternative models that respect the environment and are economically and socially acceptable. The technical or economic stumbling blocks encountered by these alternative systems raise questions about their capacity to develop, or even maintain themselves, and hence their sustainability. The ILLIAD project will seek to offer a method for analysing the systemic sustainability of food sectors, test it by analysing different sectors, and use it to provide technical or organisational innovations for the production of soft wheat, rice, peaches and apricots. The project also sets out to establish new alternative sectors, characterised by organic or low-input biological practices, short supply chains (outside catering services and direct sales in other regions) and staggered harvest dates, as well as a sector dedicated to processing, which should have a positive effect on the nutritional quality and flavour of the industry's products.

Information on this programme: tozanli@iamm.fr

Activities of our Institutes

MAI Zaragoza

Master Programmes Evaluation

Master programmes at MAI Zaragoza are periodically evaluated by the Spanish National Agency for Quality Assessment (ANECA), or its regional counterparts, in order to verify the programmes' quality. This action is common in all official university studies and involves an in-depth revision, every 4 years, of contexts, contents and organizational aspects of the different Master programmes. The Master in "Sustainable fisheries management" jointly organized with the University of Alicante has recently passed the evaluation made by ANECA. The Masters in "Plant breeding" and "Integrated planning for rural development and environmental management" jointly organized with the University of Lleida are now undergoing the evaluation process conducted by the quality agency of Catalonia. The Master in "Animal Nutrition" jointly organized with the University of Zaragoza will be assessed next autumn by the agency of Aragón.

Training and EU Projects

MAI Zaragoza has recently organised two Advanced courses in the framework of European Union projects:

- Use of Remote Sensing for Irrigation Management (21-26 November 2011). This course was the last activity of the TELERIEG project (The remote sensing use for irrigation practice recommendation and monitoring in the SUDOE space) an INTERREG IVB–SUDOE project which ended on 31st December 2011. Thirty participants from 11 Mediterranean countries attended the course that counted on 16 expert lecturers from the project beneficiary institutions and from other organisations. The programme combined the new processing techniques for remote sensing images with methods based on field sensors, thus providing a vision of the present status and future possibilities to improve the irrigation system management.
- Forest Fires in the perspective of Global Change (13-17 February 2012). This course is a dissemination action of the FUME project (Forest fire under climate, social and economic changes in Europe, the Mediterranean and other fire-affected areas of the world), a 4 year (2010-2013) project financed by the FP-7 Programme of the European Commission. 30 participants from 10 Mediterranean countries and 2 other countries (Chile and Belgium) attended the course, with 16 lecturers. The course included 18 hours of theoretical and 17 of practical sessions, and was aimed to offer updated knowledge on the interactions between climate change and other relevant factors for forest fires, on fire risk and fire regimes in general, and their consequences on ecosystems and some of the goods and services they provide. Changes in fire risk and fire regimes were analysed through the study of the recent past, focusing on the Mediterranean Basin, and through projections of future climate and other relevant drivers of fire. Particular emphasis was placed on the impacts of climate and weather extremes (e.g. droughts and heat waves) that could have a most relevant impact on fires

PARUTION

2012 edition of Mediterra
«The Mediterranean Diet for sustainable regional development»

The 2012 edition of Mediterra takes the mobilising potential of the Mediterranean Diet as a basis and proposes a multidimensional itinerary involving sociodemographics, health, ecology, enterprise, geo-economics and citizens' initiative.

Consumers in the countries of the Mediterranean Basin have progressively changed their dietary practices as they have gradually become caught up in the dynamics of urbanisation and the globalisation of agricultural trade dynamics. They are adhering less and less to the Mediterranean Diet, despite the fact that it is the basis of their identity and one of the major assets of the region. Pressures on natural resources and the emergence of new private actors are compounding the complexity of diet-related issues.

Already the subject of widespread sociocultural and scientific debate and research, the Mediterranean Diet merits reconsideration from the political point of view given the growing awareness of the strategic dimension of agriculture and the crucial role played by food production in the stability and development of societies. This diet, whose health-promoting virtues are widely recognised and which UNESCO has now listed as part of the intangible cultural heritage of humanity, is now raising questions in the fields of environmental responsibility and political action to promote greater regional cooperation.

Mediterra 2012, in which 49 international experts have participated, has been prepared in partnership with the European Institute of the Mediterranean (IEMed) and the Mediterranean Diet Foundation (FDM). It is published in English and French by the Presses de Sciences-Po.

The Report can be downloaded in free access from

www.ciheam.org

The Book can be ordered from the Publisher

www.pressesdesciencespo.fr

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Mediterra 2012

The Mediterranean Diet for sustainable regional development, Paris, Ciheam/Les Presses de SciencesPo, March 2012

CIHEAM Analytical Note

La céréaliculture en Tunisie. Une politique de régulation à repenser, M. Salah Bachta, n°64, December 2011

CIHEAM Briefing Notes

La Forêt de la Mâamora-Maroc Septentrional, K. Cherki et N. Gmira, n°76, October 2011.

Réduire les disparités régionales, un défi pour la Tunisie nouvelle, R. Béchir, n°77, December 2011.

Refrigerated rail transport of agricultural products : the « Mediterranean Corridor », M. J. Caballero Sánchez, F. Contreras López, F. García Calvo, n°78, March 2012.

Watch Letters

Labelling Mediterranean Foodstuffs : Risks and Opportunities, n°19, December 2011

NewMedit

Summary of 04/2011 issue of the review, February 2012.

Currents events in Euro-Mediterranean Agriculture, Food and Environment

Press Review, December 2011

Press Review, January 2012

Press Review, February 2012

Press Review, March 2012

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Forthcoming Watch Letter

No 21 will be issued in June 2012 and will address «Research in Mediterranean Area»

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