

WHAT IMPACTS OF INCREASED CONSUMPTION OF FRUITS AND VEGETABLES ON HEALTH AND FOOD BEHAVIORS OF POPULATION : CASE OF ALGERIA

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Objectives

The objective is to assess the impact of increased consumption of fruits and vegetables (F&V) (400g/day/capita – according to WHO recommendations), on health and food behaviors and the feasibility of consumption in poor Algerian households. Assessing knowledge and perceptions towards F&V is a second objective to target and adapt preventive measures to be implemented.

Methodology

Sampling

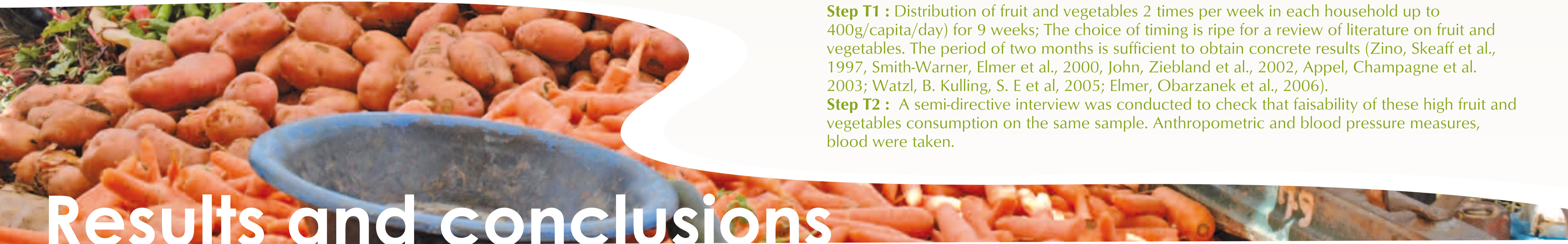
The households were selected in the El Hadj Mecheri area where a very low F&V consumption is observed. It is a rural area (the steppes), where families, with low socio-economic level, are very isolated. Thus they can hardly exchange and sell goods. Access to electricity is difficult.

The experiment was conducted in 3 steps (T0, T1, T2) on 20 households : 2 adults/household between 18-55 years (1 woman and 1 man in each household). 4 types of surveys were conducted : Anthropometric measures, blood pressure, blood taken to measure the biological parameters (cholesterol, TG, blood glucose) and nutritional markers (Vitamins E, B9, C, A, profile of fatty acids and metabolism) selected according to their impact on health. Quantitative and qualitative surveys were conducted to assess the knowledge on food-health and the limiting factors of F&V consumption.

Step T0 : Quantitative survey and semi-structured interview carried out to analyze the consumption of fruits and vegetables. Anthropometric (weight, size) and blood pressure measures, blood taken.

Step T1 : Distribution of fruit and vegetables 2 times per week in each household up to 400g/capita/day) for 9 weeks; The choice of timing is ripe for a review of literature on fruit and vegetables. The period of two months is sufficient to obtain concrete results (Zino, Skeaff et al., 1997, Smith-Warner, Elmer et al., 2000, John, Ziebland et al., 2002, Appel, Champagne et al., 2003; Watzl, B. Kulling, S. E et al., 2005; Elmer, Obarzanek et al., 2006).

Step T2 : A semi-directive interview was conducted to check that feasibility of these high fruit and vegetables consumption on the same sample. Anthropometric and blood pressure measures, blood were taken.



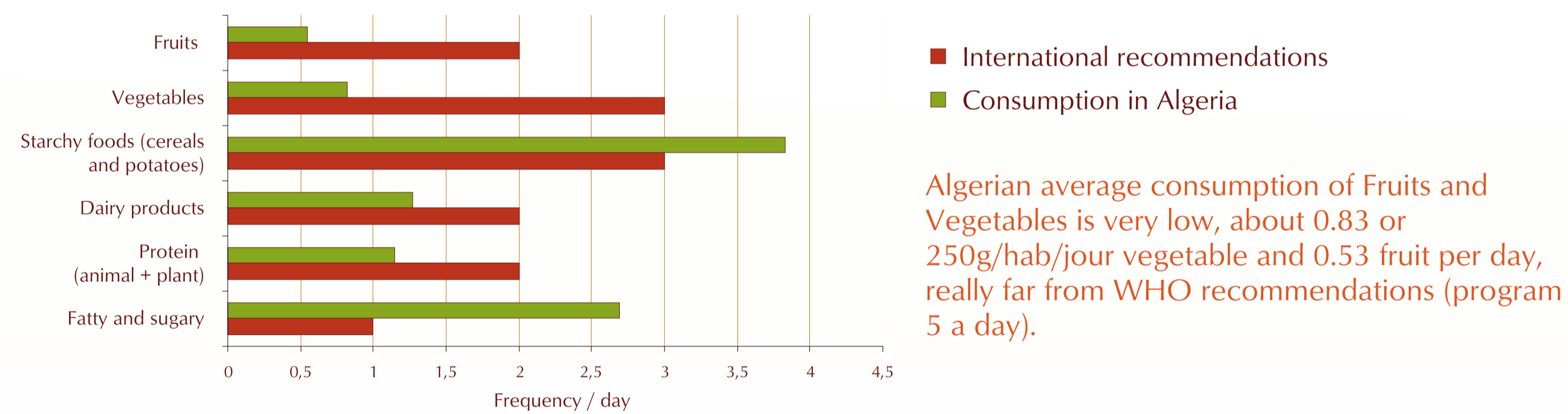
Description of sample

The size of the average household is 7.95 persons per household. The average age is 47 years. Educational attainment is low with 50% of illiterate respondents. They are all farmers and pastoralists. Animals such as donkeys, sheep and poultry adjacent houses. Stocking rate (number of persons per dwelling room) of sample is high, 3.05 against 2.58 at the national level. The comfort level is very low : only half of households have electricity (refrigerator, television) and less than one third have a stove. Communication is mainly via the mobile phone that is present in almost all families and radio is the general system information.

1 – Consumption

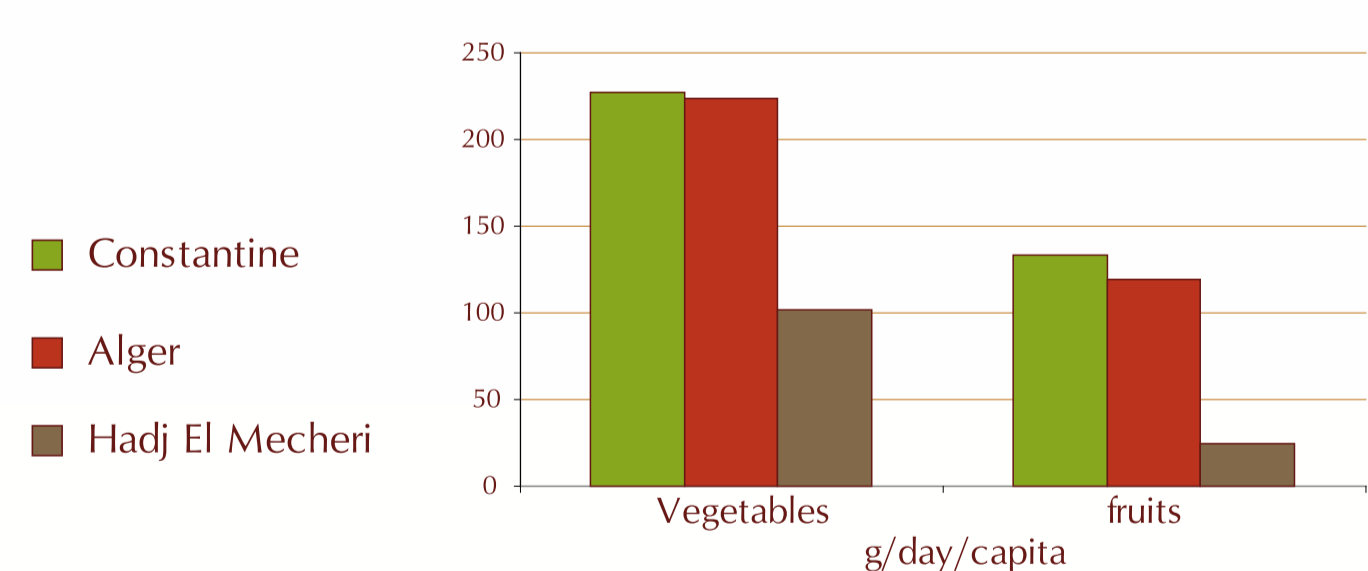
A European research project INCO-MED, TAHINA (Transition and Health Impact in North Africa), shows that in Algeria, 57.4% of the population are overweight and 22.1% are obese at the national level (TAHINA, 2007). Given this situation, the daily food consumption did not meet international guidelines for all food groups, especially in regard to fruit and vegetables.

Daily consumption by food groups in Algeria and recommendations (USDA Food Guide Pyramid, 1992).



Algerian average consumption of Fruits and Vegetables is very low, about 0.83 or 250g/hab/jour vegetable and 0.53 fruit per day, really far from WHO recommendations (program 5 a day).

Food consumption

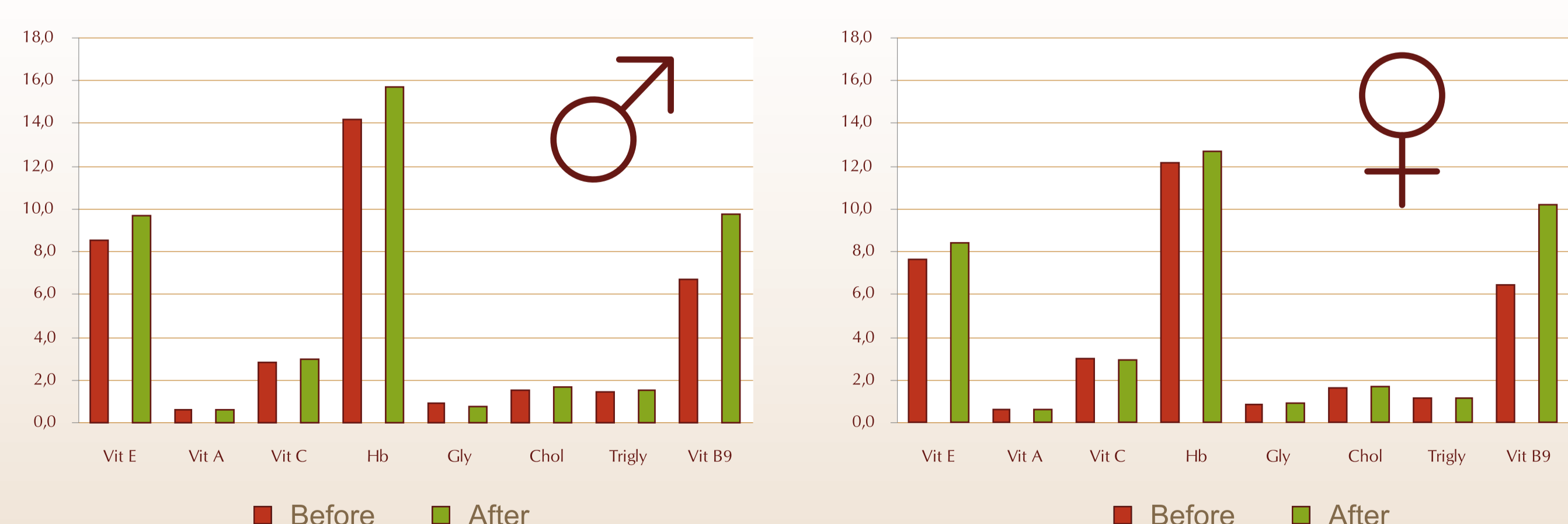


In our sample, the consumption of fruits and vegetables is particularly low because of high prices and the lack of diversity offered. Food purchases amounted on average to 360 dzd/capita/month, ~10 times less than the national level (~3065 dzd).

3 – Impact on biological measures

It appears that increased consumption of fruits and vegetables after two months results in significant increase of vitamin E and B9 and the hemoglobin in the blood and, whatever the genre.

Impact of consumption of fruits and vegetables on biological measures of men and women, BEFORE and AFTER experimentation

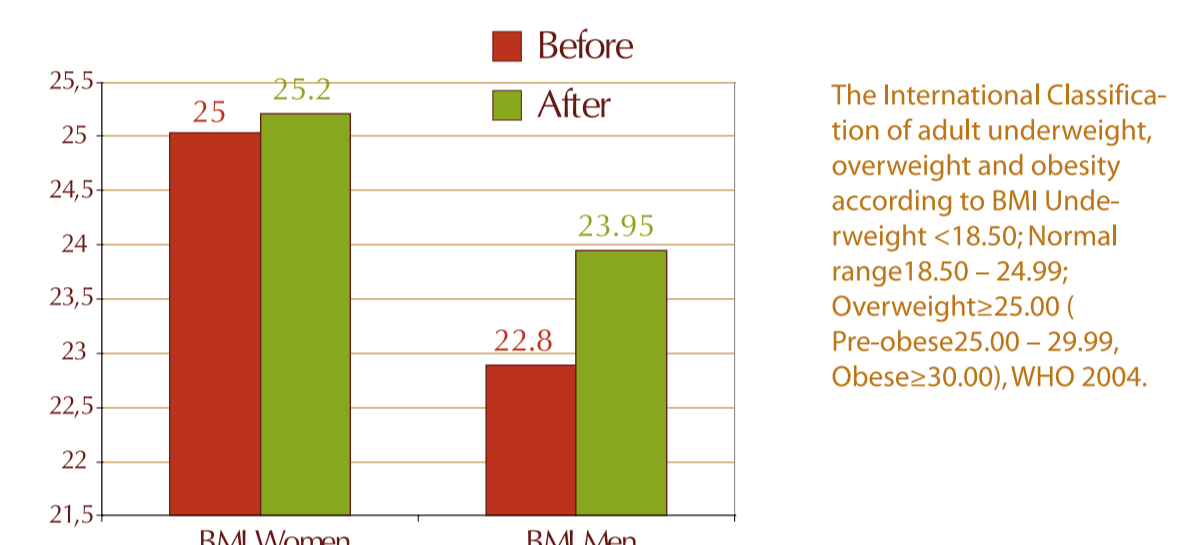


2- Real impact on Body Mass Index ?

A key finding is that increased consumption of F&V and vegetables causes weight gain for both women and men. However, a "gender" effect and different impacts between pre-obese and obese are found.

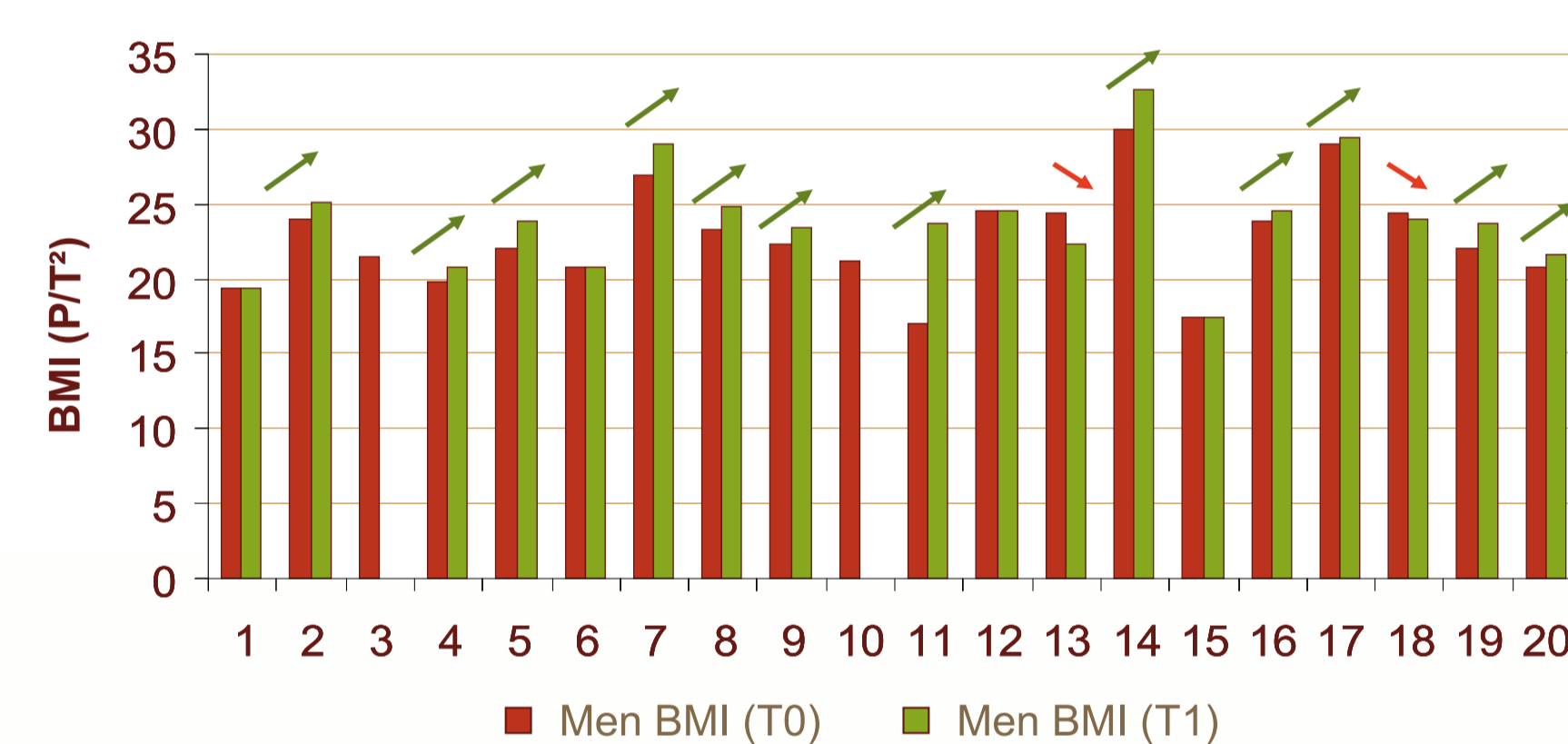
Body Mass Index (BMI) evolution

It appears that increased consumption of F&V has a different impact depending on the stage of overweight. For pre-obese, BMI seems to decrease but increases with obese. For obese people, F&V ate not substituted for usual daily food intake but taken on top of.



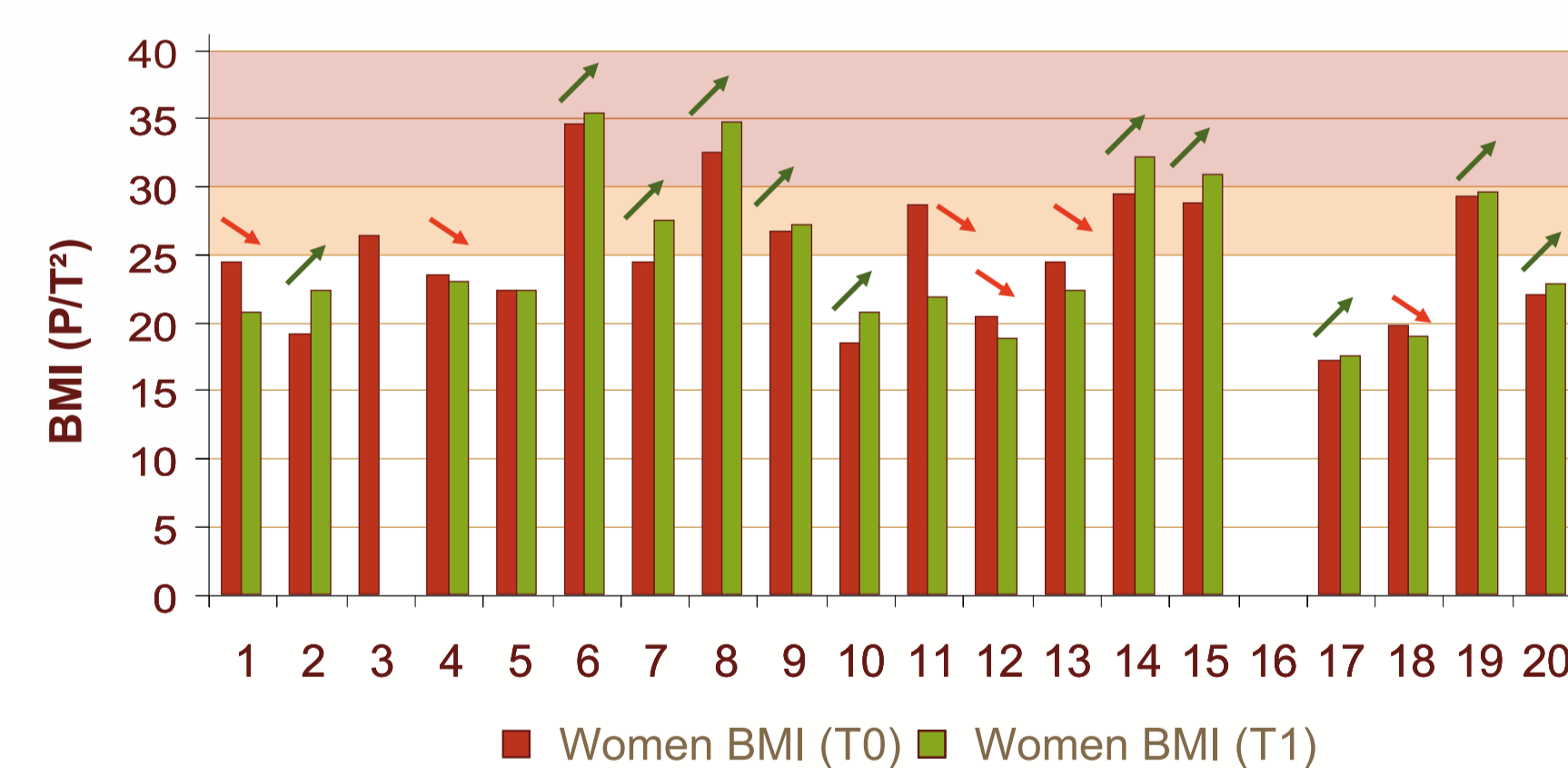
The International Classification of adult underweight, overweight and obesity according to BMI Underweight < 18.5; Normal range 18.50 – 24.99; Overweight 25.00 (Pre-obese 25.00 – 29.99; Obese 30.00; WHO 2004.

Measures BMI of men BEFORE and AFTER testing



Men are less affected by obesity. Only 3 of them were overweight. We may also note that 12 men on the 20 respondents have gained weight with the experiment and 2 lost. This impact also on high weight gain may be due to a food tradition whereby men are served first with the products of choice.

Measures BMI of women BEFORE and AFTER testing



Overall, women have gained weight with this additional intake of fruits and vegetables. Specifically, 10 women out of 20 respondents have gained weight with the experiment and 6 have lost weight. It seems that the impact is different between obese women and those who are overweight : women who are overweight tend to loose weight when obese women put on weight.

4 – Opinion on experiment

All households have reported enjoy the experiment. It helped diversify meals; usual meals come with one single dish of semolina and milk. Not surprisingly, changes in consumption have affected mostly the fruit consumption given their very high market prices. Women felt more involved and required more information. From these results, which are a first experiment, it appears that increased consumption of fruits and vegetables may play a role in improving the health status of people especially those who are overweight. By improving the daily diet, we can have a preventive effect against certain diseases such as obesity and chronic diseases related diseases such as cardiovascular disease or diabetes.

For obese people in particular, the results are more mixed. We observe and improved balance in the blood together with a clear increase in the rate of vitamins but increased consumption of fruits and vegetables doesn't result in weight lost. So there are other factors over which we must act to improve their condition and get them to change their behaviors. It is essential not to stigmatize the fruits and vegetables, promoting a balanced diet seems to be more efficient. This work also shows how important it is to make types of consumers who are sensitive to many different factors depending on their physiological state, their income, their lifestyle and the area in which they live. It is essential to adapt the actions and messages to target audiences. Nutrition education is virtually absent in the experimental area. Filling this gap, is necessary to sustainably change behaviors.

