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Mediterranean Diet in the Maghreb: An Update

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The health of the individual and the population in general is the result of interactions between genetics and a number of environmental factors. Nutrition is an environmental factor of major importance [1, 2]. The nutritional regulation occurs both by macro- and micronutrients [3]. Both micro- and macronutrients control gene expression leading to changes in cell growth, differentiation, or metabolism. Defining the molecular basis for nutrient control of gene expression provides insight into the diverse actions of nutrients in both normal and pathophysiological states and may provide novel approaches for the control of chronic diseases such as coronary artery disease, hypertension, insulin resistance, obesity and cancer [4, 5].

The Mediterranean diet has gained enormous popularity lately, mainly because it has been associated with lower death rates from coronary heart disease [6] and certain types of cancer [7], such as breast, colon, and gastric cancer. It has been suggested that certain characteristics of this diet, such as a relatively high consumption of fish, olive oil, vegetables and fruits, and low consumption of meat and animal fat were connected with the low prevalence of the above diseases [8]. Moreover, a majority of published studies refer to the fact that the incidence of some other diseases such as osteoporosis, obesity and dental caries is lower in the Mediterranean region in comparison with the western and Nordic countries [9].

However, more recent data [9–11] indicate that in the last 35 years the food pattern of the Mediterranean populations has been subjected to substantial changes. Significant changes have occurred in consumption of some, but not all, foods in both positive and negative directions with respect to dietary recommendations. Furthermore, the term ‘Mediterranean diet’ is very loose since

geographical, political and religious differences prevent a uniform dietary pattern across the Mediterranean countries and directly influence the dietary customs and habits. Thus, defining the Mediterranean diet at a regional level may provide more information than describing a common Mediterranean food pattern. Under these constraints, we will discuss the current Mediterranean diet in the region of northwestern Africa (which is also called the Maghreb). The Maghreb consists of four countries: Algeria, Libya, Morocco and Tunisia. We will compare it with the dietary patterns of the 1970s.

Generally speaking, the northern part of the Maghreb region is green and fertile with a temperate climate but soon after leaving the coastal area, the Sahara desert starts with an arid and extremely dry climate.

The native population of the Maghreb is mostly Arabs and Berbers who belong mainly to the Islamic religion. During the last 60 years, important changes have occurred in this region as a result of the termination of colonial rule. Since independence, the Maghreb countries have experienced decisive social, economic, and political changes leading to their present situation.

Recent Dietary Trends in Algeria, Libya, Morocco and Tunisia

While discussing the food consumption pattern of the populations in the Maghreb, it should be understood that we are not talking about a uniform dietary pattern of the four countries, but rather about relatively specific diets.

The composition of the diets of the four Maghreb countries, in terms of absolute quantities per consumption unit per year, is shown in figure 1. The source of the food consumption data are mostly generated nationally, but collected, analyzed and published in a standardized manner by the FAO. Although there are serious limitations to this data source, it presents practically the only standardized and consistent database available for cross-country comparison [10].

As shown in figure 1, there are differences in the consumption of specific food items among the Maghreb countries for the period 2000–2003, regarding the absolute quantities consumed. More specifically, Algeria is the country with the lowest consumption of fruits and vegetables, in comparison with the rest of the Maghreb countries. Regarding animal products (meat and eggs), Algerians consume fewer quantities than their neighbors do, but they are first in milk consumption. Regarding fish and seafood, Moroccans and Tunisians consume the highest per capita quantities whereas Algerians the lowest. Libya is the country with the lowest cereal and cereal product consumption in comparison with the rest of the Maghreb countries. Additionally, Libyans consume more vegetable oils and animal fats as well as animal products (meat and eggs), and vegetables than their neighbors do. Morocco has the highest intake of cereals and sweeteners and the

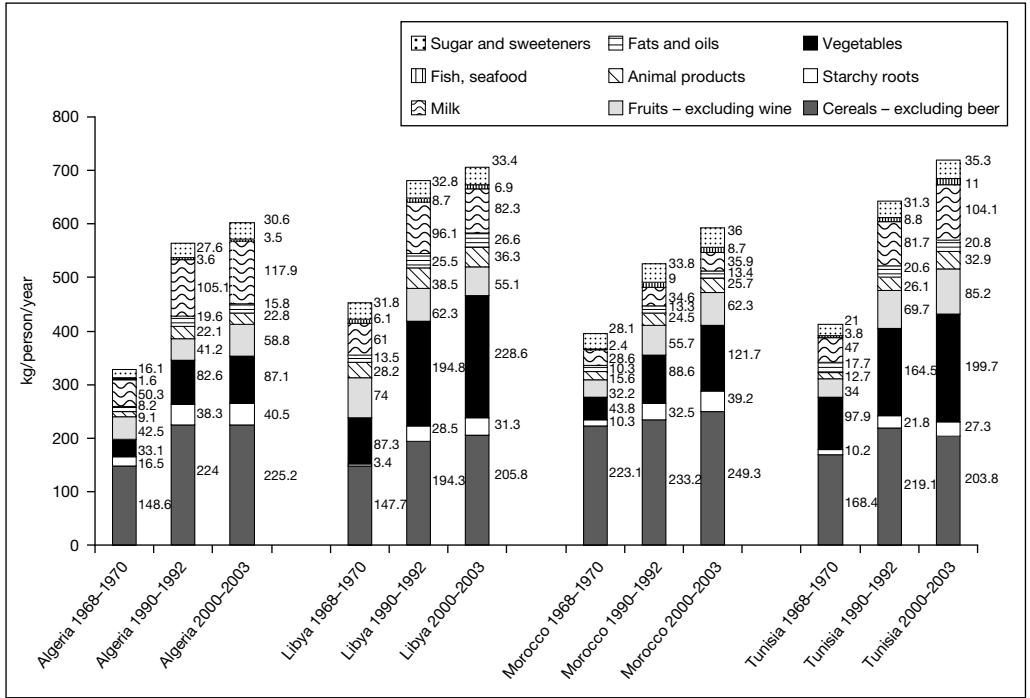


Fig. 1. Average per capita consumption (kg/person/year) of various food groups for Algeria, Libya, Morocco and Tunisia for the years 1968–1970, 1990–1992 and 2000–2003. Values are shown on the right of each food category (FAO, statistics division).

lowest of milk, fats, and oils among the Maghreb countries. Finally, Tunisians consume the highest amounts of fish and seafood as well as fruits in comparison with their neighbors.

On this basis, we could describe the diet of the Maghreb as relatively low in total fat, high in consumption of cereals and vegetable products, and low in animal products. Alcohol and wine consumption (not shown here) is very low mainly due to religious restriction.

Although it might appear self-evident that the Maghreb countries are Mediterranean, since they border the Mediterranean Sea, the food patterns of the Maghreb population are quiet different compared to those of some European Mediterranean populations. For example, cereal per capita consumption in Spain, France, Italy and Greece in 2000–2003 is remarkably lower than in the Maghreb countries (fig. 2). Furthermore, the Maghreb diet contains much less animal products (milk, meat and eggs) than Spain, France, Italy and Greece. The same applies for the USA and UK (non-Mediterranean European countries).

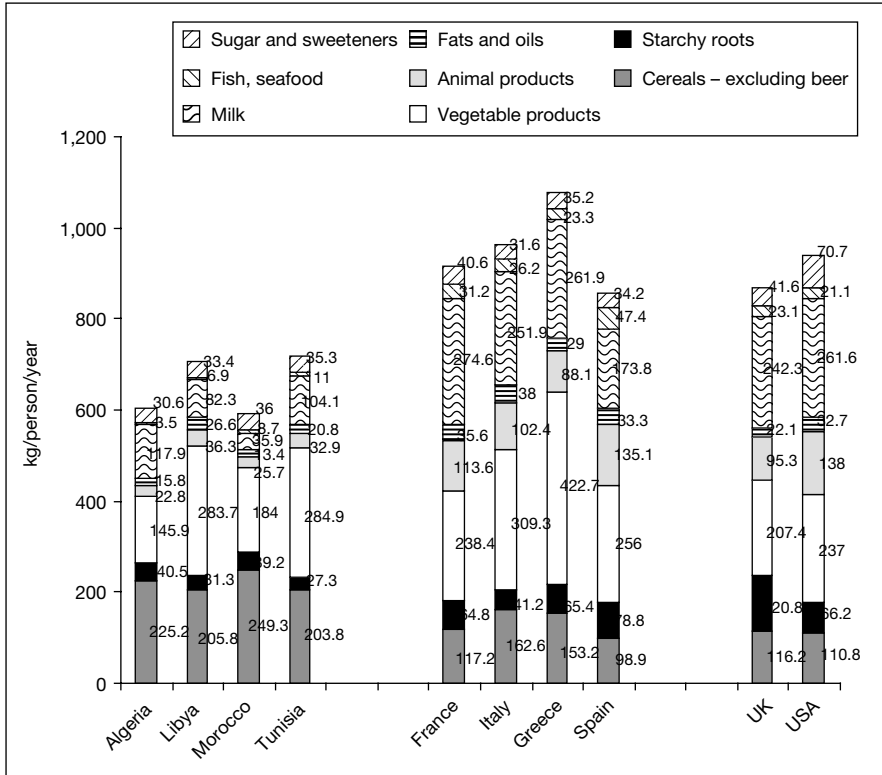


Fig. 2. Average per capita consumption (kg/person/year) of various food groups for the Maghreb countries (Algeria, Libya, Morocco and Tunisia), some Mediterranean European countries, the United Kingdom and the USA for the years 2002–2003. Values are shown on the right of each food category (FAO, statistics division).

Quite unexpectedly, the Maghreb diet is lower in vegetable product consumption except for Libyans and Tunisians who consume higher amounts of vegetables than the French, Italian and Spaniards. Fat and oil consumption also provides an unexpected picture since the Maghreb diet is much lower in fats and oils than the diet in Spain, France, Italy, Greece, UK and USA. Another large variation among the food habits of some European Mediterranean countries and the Maghreb is that of fish consumption. Spain, Italy, France and Greece consume almost three times more fish than the Maghreb countries. We should underline at this point that fish is not easily available in the Maghreb due to difficulties in its preservation and transportation. This problem is even more difficult in the southern part of these countries. Finally, the consumption of sweeteners is almost the same in the Maghreb and the four European Mediterranean countries.

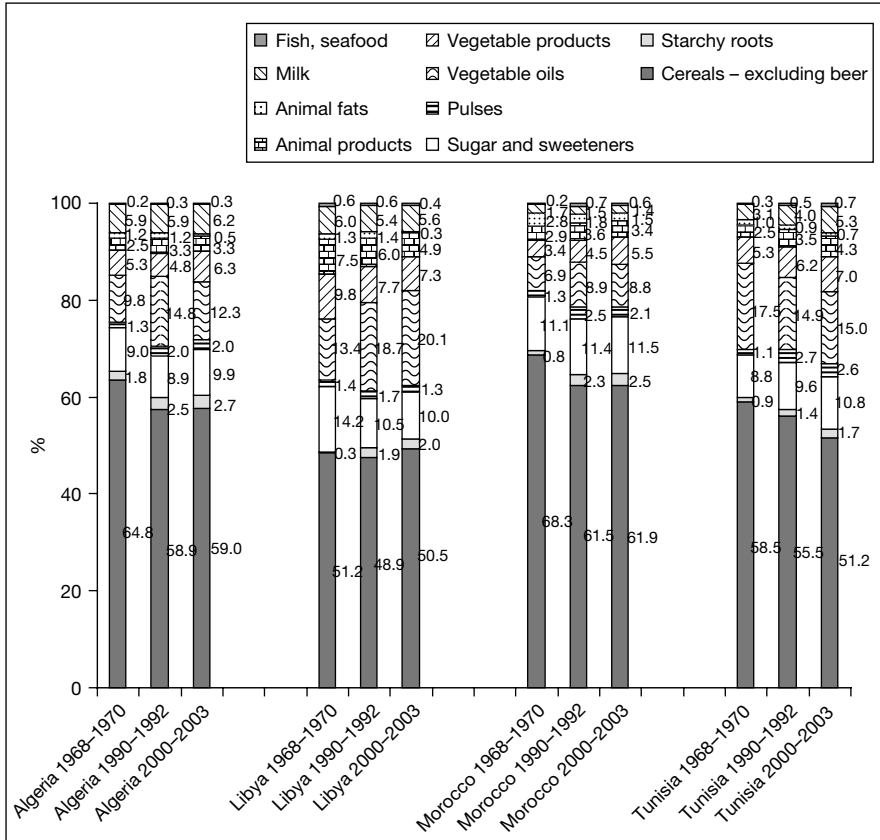


Fig. 3. Percent contribution of various food groups to total dietary energy intake (calories/person/day) in Algeria, Libya, Morocco and Tunisia for the years 1968–1970, 1990–1992 and 2000–2003. Values are shown on the right of each food category (FAO, statistics division).

Taking into account the above-mentioned differences, it is quite clear that the Mediterranean diet is not a homogenous nutritional model. There are several Mediterranean nations with varied cultures, traditions, incomes and dietary habits resulting in a wide variation of the dietary patterns within the Mediterranean region.

To better illustrate the differences among the Maghreb countries, the contribution of the various food groups to total energy supply, for the years 2000–2003, has been calculated and it is presented in figure 3. This provides a visual representation of the differences, but the absolute values should be kept in mind, in order not to lose the overall perspective. The picture remains essentially the same and confirms that the countries of the Maghreb consume