Nutrition & Food Science

Evolution of human diet and effect of globalization on regional diet with emphasis to the Mediterranean diet

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1. Introduction

The Mediterranean Diet, from the Greek word "díaita" according to nutritionists is a "traditional diet" which is adapted to people living in countries bordering the Mediterranean Sea whose ancestors moved to the "cultivated food". It can be described as a unique lifestyle composed of a mosaic culture manifested through related festivals and celebrations which determines a circular line that touches Spain and passes through the south of France to include Italy, Corfu, Greece and encompasses the Asian and the North African countries (Willett *et al.,* 1995; Bach-Faig *et al.,* 2011; Venditto *et al.,* 2014). The Mediterranean diet is an eating pattern characterizing a lifestyle and culture that has been reported to contribute to better health and quality of life. It is a sustainable diet model that respects the environment, promotes the bio-diversity, the local cultural heritages, the social interaction and economic aspects (Vitiello *et al*., 2016). According to UNESCO Representative List of the Intangible Cultural Heritage of Humanity in 2010; Mediterranean diet is highlighted as an essential part of Mediterranean social life, drawing on the expertise, knowledge and traditions that go into all aspects of food production and consumption in the Mediterranean, from farm to fork, including cultivation, harvesting, gathering, fishing, preservation, preparation, cooking and, most important of all, ways of eating (Lacirignola *et al.,* 2010; Dernini and Berry, 2015).

Although, the term "Mediterranean diet" implies the existence of some common dietary characteristics in Mediterranean countries such as: high amounts of olive oil and olives, fruits, vegetables, cereals (mostly unrefined), legumes, and nuts, moderate amounts of fish and dairy products, and low quantities of meat and meat products. Wine in moderation is acceptable when it is not contradictory to religious and social norms (Estruch, 2010; Dernini and Berry, 2015). In the traditional Mediterranean diet, as in many traditional everyday diets, plant foods constituted the core of the daily intake, whereas foods from animals were more peripheral (Willett *et al.,* 1995).

In recent years, the Mediterranean diet has received worldwide attention particularly for its health impact (Sofi *et al.,* 2008) as, prevention and control of type 2 diabetes (Martínez-González *et al.,* 2008; Esposito *et al.,* 2010; Georgoulis *et al.,* 2014), anti-inflammatory effects (Estruch, 2010), decrease the risk of overall mortality, mortality from cardiovascular diseases, incidence of or mortality from cancer, and incidence of Parkinson's disease and Alzheimer's disease (Estruch *et al.,* 2006; Sofi *et al.,* 2008; Trichopoulou *et al.,* 2014).

The notion of the Mediterranean diet has undergone a progressive evolution over the past 60 years, from a healthy dietary pattern to a sustainable dietary pattern, in which nutrition, food, cultures, people, environment, and sustainability all interact into a new model of a sustainable diet. Food systems around the world are changing rapidly, with profound implications for diets and food consumption outcomes. Food consumption is variably affected by a wide range of factors including food availability, food accessibility, and food choices, which in turn may be influenced by geography, demography, disposable income, socioeconomic status, urbanization, globalization, religion, culture, marketing, and consumer attitude (Kearney, 2010; Reisch *et al.*, 2013). This review emphasizes on evolution of human diet from earliest human ancestors to current civilization, effect of Mediterranean on human health and the role of globalization to shift traditional diet, particularly Mediterranean diet to processed foods.

2. Diet and the evolution of the earliest human ancestors

Diet is related human history and expressed in different contexts by different authors. It is a key to understanding the past, present, and future of our species. Diet is a key to understanding the evolution of our distant ancestors and their kin, the early hominians (Ungar, 2007). Much of the evolutionary success of our species can be attributed to our ability to procure, process, and consume a wide range of foods. However, recent changes in our diet (e.g., increased intake of such things as saturated fat, refined carbohydrates, and sodium, and decreased intake of non-nutrient fiber) may lie at the root of many of the health problems swamping our healthcare systems (Eaton and Cordain, 1997; Ungar and Teaford, 2002).

Humanity has existed as a genus for about 2 million years, and our pre-human hominid ancestors, the australopithecines, appeared at least 4 million years ago (Table 1). Hominid means; living humans and our fossil ancestors that lived after the last common ancestor between humans and apes. The foods available to evolving hominids varied widely according to the paleontological period, geographical location, and seasonal conditions, so that our ancestral line maintained the versatility of the omnivore that typifies most primates (Eaton and Konner, 1985).

The evolution of hominin diets is concerned with several reasons. One reason is our fundamental concerns over our own present-day eating habits and the consequences of societal choices, such as unhealthy obesity in some cultures and equally unhealthy starvation in others. Another is that humans have invented many ways of feeding in extremely varied environments, and these adaptations, which are different in important ways from our closest biological relatives, must have historical roots of varying depths. The third reason why most paleoanthropologists are interested in this question is that a species' trophic level and feeding adaptations impose constraints on variables such as body size, locomotion, life history strategies, geographic range, habitat choice, and social behavior (Ungar, 2007).

The first revolution in feeding habits occurred with the "discovery" of fire by the human ancestor *H. erectus*, the direct ancestor of *H. sapiens*. Cooking favors digestion and can eliminate possible toxins contained in the food, thus probably incorporating several feeding items into the primitive human diet. Scientists hypothesize that, in addition to the feeding aspect, fire propitiated the social gathering of people for a meal. The second revolution occurred approximately 11,000 years ago with the advent of agriculture in Southwest Asia. This not only signaled the introduction of grain in the human diet (e.g., oats, barley, rye, wheat, etc.) but also established the human population in certain locations (Zucoloto, 2011). There is growing awareness that the profound changes in the in diet and other lifestyle conditions that began with the introduction of agriculture and animal husbandry about 10,000 years ago occurred too recently on an evolutionary time scale for the human genome to adjust.

Also, in early human evolution, australopithecines recognized with agriculture; more extensive exploitation of plants, including cereals, grasses, and sedges, while Neandertals were skilled hunters of large animals and ate plant foods (Leonard *et al.,* 2010). This omnivory characteristic allowed the human species to establish itself worldwide. If humans were exclusively vegetarian, then they would not establish themselves in areas with few plants, such as in Alaska. If they were exclusively carnivores, then they would have faced substantial difficulty in primitive times, mainly because successful hunting was not guaranteed (Zucoloto, 2011). However, since the invention of agriculture, and since the soaring rise of technology, some humans have begun to eat different, less balanced diets. Many of the world's poor are obliged by circumstance to eat mainly starch, while in cities the affluent populations can choose novel gastronomic patterns impossible for our ancestors, such as fiber-free diets or fat-rich diets coupled with inactive lifestyles. With these extremes, despite human physiological flexibility, health problems may arise that are linked to eating patterns unique in the long-term history of human diets (Isaac and Sept, 1988).

So, agriculture markedly altered human nutritional patterns: over the course of a few millennia the proportion of meat declined drastically while vegetable foods came to make up as much as 90% of the diet." This shift had prominent morphologic consequences: early European *Homo sapiens*, who enjoyed an abundance of animal protein 30,000 years ago, were an average of six inches taller than their descendants who lived after the development of farming. Since the Industrial Revolution, the animal protein content of Western diets has become more nearly adequate, as indicated by increased average height: we are now nearly as tall as were the first biologically modern human beings. However, our diets still differ markedly from theirs, and these differences lie at the heart of what has been termed "affluent malnutrition" (Eaton and Konner, 1985).

Two million years ago, our ancestors had feeding patterns depends on fruit and leaves as the predominate foods; probably like those of several primates today. While the increasing use of technology in food acquisition through time paces dietary changes, the way dietary patterns were causally linked to technological developments is still imperfectly understood. The first steps away from this, taken by our ancestors two or three million years ago, added meat, and probably (starchy) tubers, to the diet. Then for a very long time human ancestors undoubtedly ate varied, fiber-rich diets that combined proportions of starches, meats, nuts, fruits, and some leaves. Some of the genetically controlled physiological differences between modern humans and apes are, in fact, probably linked to the long-term history of such distinct, human dietary patterns (Isaac and Sept, 1988).

Cereal grains as a staple food are a relatively recent addition to the human diet and represent a dramatic departure from those foods to which we are genetically adapted. Discordance between humanities genetically determined dietary needs and his present-day diet is responsible for many of the degenerative diseases which plague industrial man. Although cereal grains are associated with virtually every highly-developed civilization in mankind's history and now occupy the base of the present-day food selection pyramid in the United States, there is a significant body of evidence which suggests that cereal grains are less than optimal foods for humans and that the human genetic makeup and physiology may not be fully adapted to high levels of cereal grain consumption (Cordain, 1999).

The novel foods (dairy products, cereals, refined cereals, refined sugars, refined vegetable oils, fatty meats, salt, and combinations of these foods) introduced as staples during the Neolithic and Industrial Eras fundamentally altered several key nutritional characteristics of ancestral hominin diets and ultimately had far-reaching effects on health and well-being (Cordain *et al.,* 2005). As these foods gradually displaced the minimally processed wild plant and animal foods in hunter-gatherer diets, they adversely affected the following dietary indicators 1) glycemic load, 2), fatty acid composition, 3) macronutrient composition, 4) micronutrient density, 5) acid-base balance, 6) sodium-potassium ratio, and 7) fiber content.

Human life histories, as compared to those of other primates and mammals, have at least four distinctive characteristics: an exceptionally long lifespan, an extended period of juvenile dependence, support of reproduction by older post-reproductive individuals, and male support of reproduction through the provisioning of females and their offspring. Another distinctive feature of our species is a large brain, with its associated psychological attributes: increased capacities for learning, cognition, and insight (Kaplan *et al.,* 2000). Comparison of human dietary patterns and metabolic requirements to those of nonhuman primate species insights into the evolution of our nutritional needs. In general, primate diet quality (i.e., caloric and nutrient density) is inversely related to body size and total resting metabolic requirements (RMR). Humans, however, consume a diet of much higher quality than is expected for our size and metabolic needs. This energy-rich diet appears to reflect an adaptation to the high metabolic cost of our large brain. Among primates, the relative proportion of resting metabolic energy used for brain metabolism is positively correlated with relative diet quality. Humans represent the positive extreme, having both a very high-quality diet and a large brain that accounts for 20-25% of resting metabolism (Leonard and Robertson, 1994).

The evolution of large human brain size has had important implications for the nutritional biology of our species. Large brains are energetically expensive, and humans expend a larger proportion of their energy budget on brain metabolism than other primates. The high costs of large human brains are supported, in part, by our energy and nutrient-rich diets. Among primates, relative brain size is positively correlated with dietary quality, and humans fall at the positive end of this relationship. Consistent with an adaptation to a high-quality diet, humans have relatively small gastrointestinal tracts. In addition, humans are relatively "under-muscled" and "over fat" compared with other primates, features that help to offset the high energy demands of our brains. Paleontological evidence indicates that rapid brain evolution occurred with the emergence of Homo erectus 1.8 million years ago, and was associated with important changes in diet, body size, and foraging behavior (Leonard *et al.,* 2007).

3. Mediterranean diet pyramids

The Mediterranean diet can be described as a dietary pattern characterized by high consumption of olive oil (as the prevalent visible fat), vegetables, legumes, whole grain products, fruits, and nuts. The Mediterranean dietary pattern, through a healthy profile of fat intake, low proportion of carbohydrate, low glycemic index, high content of dietary fiber, antioxidant compounds, and anti-inflammatory effects, reduces the risk of certain pathologies, such as cancer or Cardiovascular Disease (Castro-Quezada et al., 2014). The Mediterranean diet reflects food patterns typical of Mediterranean regions, where olive oil plays an essential role in the diet pyramid. The intake of saturated animal fats is relatively low; a moderate fish consumption (varying with proximity to the sea) furnishes an adequate provision of polyunsaturated fats. Red wine, generally consumed during meals, is the principal source of alcohol. There is no single Mediterranean diet. The dietary practices of countries bordering the Mediterranean Sea vary considerably; even within the same country, significant differences in dietary pattern exist (Serra-Majem *et al.,* 2012). Major differences in the traditional eating habits of citizens from countries bordering the Mediterranean Sea are noted in Table 2.

Diet pyramids are considered a useful way to display the general principles of a diet including approximate recommendations for quantities of food groups i.e., those consumed in greatest quantities appear in the largest section of the pyramid (Davis *et al*., 2015). The Mediterranean diet pyramid (Figure 1) is designed to convey a general sense of the relative proportions and frequency of servings of foods and food groups that contribute to this overall dietary pattern, modified considering contemporary research (Willett *et al.,* 1995). The 'Mediterranean diet pyramid: a lifestyle for today' summarizes and updates the traditional Mediterranean diet of those areas of the Mediterranean basin that have evolved with modernization (Bach-Faig *et al.,* 2011). Mediterranean Diet pyramids have been designed for the population of Greece, Spain and Italy, tailored for their different food habits. These refer variously to portion sizes and frequency of consumption daily, weekly and monthly and are not standardized (Del Balzo *et al.,* 2012).

By taking into consideration all scientific evidence for the health benefits of the Mediterranean diet and its protective effect against chronic diseases, as well as the present way of life and environmental constraints, the modern Mediterranean diet pyramid has evolved to reflect a lifestyle for today. As an initiative of the Mediterranean Diet Foundation together with the Forum of the Mediterranean Food Cultures and with the collaboration of numerous international entities, a wide range of experts in nutrition, anthropology, sociology, and agriculture have reached a consensus to create a new, richer education tool (Figure 1) and an accompanying text. The pyramid addresses the healthy adult population, and should be adapted to the specific requirements of children, pregnant women, and individuals under other health circumstances (Serra-Majem *et al.,* 2012).

The main purpose of this collaboration was to study the intrinsic value of the Mediterranean Diet and encourage the development of an agri-food sector that respected the environment and was in tune with the requirements of the new millennium. The pyramid is divided into three parts, which group the food per the recommended frequency of consumption: weekly, daily and at main meals. At the top, we find food intended to be consumed in moderation over the week, namely cakes, red meats and pork products; in the middle, there are those that should be consumed every day, such as milk and its derivatives, with aromatic vegetables, herbs and spices replacing fatty sauces. At the base of the pyramid we find the main meals, which should include at least two portions each of fruit and vegetables, of varying colors and varieties, and cereals, preferably wholegrain (Lacirignola *et al.,* 2010). Mediterranean diet pyramid for Italian people had proposed based on the traditions, cultural heritage and scientific evidence showed only cereal foods with low glycemic index and rich in fiber must be placed at the base of the Mediterranean diet pyramid, whereas refined grains and high glycemic index starchy foods must be sited at the top (D'Alessandro and De Pergola, 2014; Vitiello *et al*., 2016).

4. Health Benefits of Mediterranean Diet

Originally the Mediterranean diet represented that of a rural and poor society. But it is probably one of the healthiest dietary models known today, with only a few Asian diets, such as the Japanese, being comparable (Serra-Majem *et al.,* 2003; Bach-Faig *et al.,* 2011). The current perception of the Mediterranean Diet is most focused on its functional health benefits, related to the consumption of a balanced quantity of different nutrients, distributed within a pyramid structure (Del Balzo *et al.,* 2012). Plant-based foods are situated at the base of the pyramid (Serra-Majem *et al.,* 2012). They provide key nutrients and protective substances that contribute to the general well-being and contribute to maintain a balanced diet, therefore, should be consumed in high proportions and frequency. Foods situated in the upper levels such as from animal origin, rich in sugars and in fats should be eaten in moderation and left for special occasions (Bach-Faig *et al.,* 2011).

The Mediterranean lifestyles, including nutrition and sleeping patterns as well as social integration, may play a role in reducing age-related diseases (Grosso *et al*., 2017). Mediterranean countries benefiting from lower rates of chronic disease morbidity and higher life expectancy. The traditional Mediterranean diet protects against myocardial infarct, certain tumors such as breast, colorectal and prostate, diabetes and other pathologies associated with oxidative stress. Moreover, the Mediterranean diet has been postulated as having a protective role in the development of Alzheimer's disease, certain digestive diseases and even infections, among others. Additionally, it may contribute to reducing complications in various diseases such as the onset of a second myocardial infarct or risk of coronary heart intervention failure, as well as diabetic vascular complications (Trichopoulou *et al.,* 2003; Serra-Majem *et al.,* 2004; Schröder, 2007, Kontogianni *et al,* 2008; Sofi *et al.,* 2008; Mariscal-Arcas *et al.,* 2009; Sofi *et al.,* 2010; Trichopoulou, 2012).

Cardio Vascular Disease is the main cause of death worldwide at the turn of the 21st century especially in industrialized countries (Estruch, 2010). Adherence to the Mediterranean diet is useful in primary cardiovascular prevention and reduces risk factors for atherosclerosis. Mediterranean diet with virgin olive oil or mixed nuts showed lower blood pressure (hypertension), improved lipid profiles, decreased insulin resistance, and reduced concentrations of inflammatory molecules compared with those allocated to a low-fat diet (Estruch *et al.,* 2006, Estruch *et al.,* 2013). Olive oil contains a large proportion of monounsaturated fat, is relatively low in saturated fat, and is a source of the antioxidant vitamin E (Willett *et al.,* 1995). A recent study in Australia on 166 men and women aged >65 years also had showed that Mediterranean diet significantly lower systolic blood pressure and improved endothelial function (Davis et al., 2017).

Polyunsaturated fatty acids (PUFA) such as linoleic acid (LA; C_{18}:2ω_6) and α-linolenic acid (LNA; C_{18}:3ω_3), are fatty acids with 18-carbon chains are considered as biologically significant essential fatty acids (Eaton *et al.,* 1998). Hence, adherence to Mediterranean diet with walnuts increased the intake of α-linolenic acid, the plant n-3 fatty acid; thus, walnut consumption may have helped lower blood pressure Consumption of monounsaturated fatty acids is thought to increase insulin sensitivity, and this component of the diet might explain the favorable effect of the Mediterranean diet on the need for antihyperglycemic drug therapy (Esposito *et al.,* 2009).

Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia, resulting from defects in insulin secretion, insulin action, or both. Long considered a disease of minor significance, in the 21st century (Georgoulis *et al.,* 2014). Acute elevations in blood glucose concentrations, along with increases in hormones secreted from the gut, stimulate pancreatic insulin secretion causing an acute rise in blood insulin concentrations. Consumption of mixed meals containing protein and fat combined with carbohydrate may lower the total glycemic and insulinemic response of the carbohydrate food alone (Cordain *et al.,* 2005). The study on the relation between adherence to a Mediterranean diet and the incidence of diabetes among initially healthy participants; suggests that substantial protection against diabetes can be obtained with the traditional Mediterranean diet, rich in olive oil, vegetables, fruits, nuts, cereals, legumes, and fish but relatively low in meat and dairy products (Martínez-González *et al.,* 2008; Consortium, 2011).

The protein adiponectin is secreted by adipose (fat) tissue. Adiponectin levels are inversely correlated with obesity and abdominal fat. Also, adiponectin has positive effects on insulin sensitivity and has anti-inflammatory properties, with higher adiponectin levels were found to be associated with a lower risk of type 2 diabetes (Esposito *et al.,* 2010). It was reported that increased adherence to a Mediterranean diet was associated with higher levels of adiponectin, which are associated with a reduced risk for type 2 diabetes. So, a mechanism through which Mediterranean diet may improve glycemic control may be through amelioration of insulin sensitivity mediated by increased circulating adiponectin levels (Esposito *et al.,* 2009).

There are also studies investigated on the role of healthy eating patterns such as Mediterranean diet on the psoriasis. Psoriasis is considered as an inflammatory skin disease which is characterized by hyperproliferation and poor differentiation of epidermal keratinocytes. The prevalence rate of psoriasis is mostly quoted to be around 2-4%. Diet has been suggested to play a role in the etiology and pathogenesis of psoriasis. Vegetarian diets, fish rich in n-3 polyunsaturated fatty acids and a gluten free diet are beneficial and improve psoriasis severity in patients (Wolters, 2005). Armstrong *et al* (2012) observed a systematic review and meta-analysis of association between psoriasis and obesity which revealed that psoriasis patients have higher prevalence and incidence of obesity. Obesity has been associated with a proinflammatory state and several studies have demonstrated a relationship between body mass index and psoriasis severity. Patients with severe psoriasis have greater odds of obesity than those with mild psoriasis. Weight loss in overweight or obese subjects, through decreased caloric intake, appears to have an added beneficial effect on psoriasis or psoriatic arthritis when used in conjunction with other prescription medications (Debbaneh *et al*., 2014).

The association between psoriasis and celiac disease were also studied in relation to diet. Patients with psoriasis have been shown to have a higher prevalence of other autoimmune diseases including celiac disease, a condition marked by sensitivity to dietary gluten (Wu et al., 2012; Bhatia *et al*., 2014). Bhatia *et al*. (2014) had performed a meta-analysis to show that psoriatic populations have an approximately 2.4-fold increased risk of elevated levels of AGA (antigliadin antibody) compared with control subjects. Psoriasis and celiac disease share common genetic and inflammatory pathways. A gluten-free diet has been reported to be beneficial in some patients with psoriasis, particularly those who test positive for celiac disease markers.

Barrea *et al* (2015) studied to evaluate the association between adherence to the Mediterranean diet and the severity of psoriasis, with a strict relationship between a higher consumption of extra virgin olive oil and a lower psoriasis severity. The association between the Mediterranean Diet and psoriasis severity suggests the possible beneficial effects of nutritional interventions promoting a Mediterranean food pattern rich in extra virgin olive oil, fruits, vegetables, fish, chicken and whole grains, as an inexpensive and safe adjuvant treatment for psoriatic patients.

5. Effect of Globalization on Mediterranean Diet

Globalization refers to the increasing integration of the world's economy through the reduction of various barriers in international trade. Through globalization, regional economies, societies and cultures have become integrated by communication, transportation and trade. The term also applies to the international circulation of ideas and cultural aspects. Globalization is driven by a combination of economic, technological, socio-cultural and political factors (Kontogianni *et al.,* 2008). Globalization processes can cause; the nutrition transition towards poor quality, energy-dense diets and the increasing prevalence of chronic disease by two pathways. First, globalization-driven changes in the social system, including income growth, urbanization, and employment, can drive dietary changes. Second, globalization-related changes in the food system can alter the amount and quality of food available for consumption (Hawkes *et al.,* 2009).

Accumulating evidences suggest that foods that were regularly consumed during the human primates and evolution, during the Paleolithic era (2.6-0.01 x 10^6 years ago), may be optimal for the prevention and treatment of some chronic diseases. "Paleolithic diet," is an ancestral diet characterized by higher protein, less total fat, more essential fatty acids, lower sodium, and higher fiber, should serve as a reference standard for modern human nutrition. At least 70% of the Western populations of daily energy intake is provided by foods that were rarely or never consumed by Paleolithic hunter-gatherers, including grains, dairy products as well as refined sugars and highly processed fats (Kowalski and Bujko, 2012). The changes in eating habits and decreased physical activity have been responsible for part of the high prevalence of chronic diseases in the so-called civilized societies. These diseases are less prevalent in previous civilizations and several decades of nutrition research have enabled better understanding of the eating habits of our ancestors, and have demonstrated the value of diet called ''Mediterranean or Paleolithic'' (Chauveau *et al*., 2013).

Mediterranean region has had one of the world's most distinctive and area-specific diets. However, culture has been changing very rapidly in the Mediterranean region due to the expansion of technology and increase in travel capability over the past two centuries. Industrialized countries now promote a lifestyle that is business oriented and faster paced. Fewer people are cooking from scratch, and more people are either eating in restaurants or choosing to ready-to-heat-and-eat processed foods from the supermarket. This has caused diet quality in the Mediterranean countries to deteriorate; as the traditional Mediterranean diet based on fish, fruits and vegetables, whole grains, and healthy fats has been replaced with a diet that contains more red meat, sweets, and processed foods. While the traditional diet was based on healthy foods, today people in the region consume a more Western-influenced diet that contains mostly high in animal products and refined carbohydrates and low in whole grains, fruits, and vegetables (Hu, 2008).

Therefore, diversities of the Mediterranean food cultures as well as many elements of the Mediterranean diet are currently under the risk of extinction for the effects of globalization, the homogenization of lifestyles, the losing of awareness, meanings, understanding and appreciation, which lead to the erosion of the Mediterranean heritage and to the lack of interest among younger generations about their own heritage (Del Balzo *et al.,* 2012). The changes in Mediterranean Diet have undergone with regards to the reduction of calorie consumption and expenditure, the incorporation of low nutrient dense foods (such as soft drinks, sweets, bakery products), and the food processing methods (such as refinement of flour), have contributed to an increased risk of deficient intakes for some vitamins, especially folates, vitamins A and D, as well as inadequate intakes for the rest of the vitamins (Serra-Majem *et al.,* 2003; Kontogianni *et al.,* 2008; Mariscal-Arcas *et al.,* 2009).

For example, in Spain, in association with cultural and lifestyle changes, there has been a reduction in the intake of antioxidants and vitamins, an increase in the proportion of saturated fatty acid and a decrease in the consumption of fiber, among other changes. Children and adolescents may be the age groups with the most deteriorated Mediterranean diet (Mariscal-Arcas *et al.,* 2009). These energy-dense foods high in saturated fat and low in micronutrients have replaced traditional foods and they now constitute a large part of young people's diet, thus contributing to obesity and increasing cholesterol concentrations (Serra-Majem *et al.,* 2003; Mariscal-Arcas *et al.,* 2009).

Although, moving away from the traditional Mediterranean Diet model; is described as passing through a "nutritional transition" in which problems of under-nutrition coexist with overweight, obesity, and food-related chronic diseases (Dernini and Berry, 2015). Due to nutrition transition, people are consuming more fats, sweeteners, energy-dense foods, and highly processed foods compared to traditional diets characterized by higher intake of cereals. The shift typically begins with major increases in domestic production and imports of oilseeds and vegetable oils. Consumption then increases of animal-source foods (meat, milk) and processed foods such as snacks, soft drinks, breakfast cereals, and processed dairy products. The transition is also characterized by increased consumption of foods away from home, such as street foods and fast foods. Because of these changes, people who do not consume sufficient energy to assuage hunger face nutrition insecurity through an inadequate supply of micronutrients, while those who do consume sufficient energy also face nutrition insecurity through an intake of unhealthy levels of saturated fat and free sugars (Hawkes *et al.,* 2009).

6. Conclusion

Humans, consume a diet of much higher quality than non-human primate species due to our relative proportion of resting metabolic energy used for brain metabolism is positively correlated with relative diet quality. This energy-rich diet appears to reflect an adaptation to the high metabolic cost of our large brain. The evolution of large human brain size is associated with psychological attributes: increased capacities for learning, cognition, and insight. A lot of recent studies are focusing on health benefit of Mediterranean diet. The benefit of eating Mediterranean diet in reduction of cardiovascular disease, cancer, diabetes mellitus, neurodegenerative diseases, obesity and mortality were reported. It is the healthiest everyday dietary models, characterized by high daily intake of plant foods and less consumption of foods from animals. However, globalization shifts this traditional diet, to nutrition transition characterized by increased consumption of foods away from home, such as street foods and fast foods. The nutrition transition causes shifts of healthy foods towards poor quality, energy-dense diets and the increasing prevalence of chronic disease.

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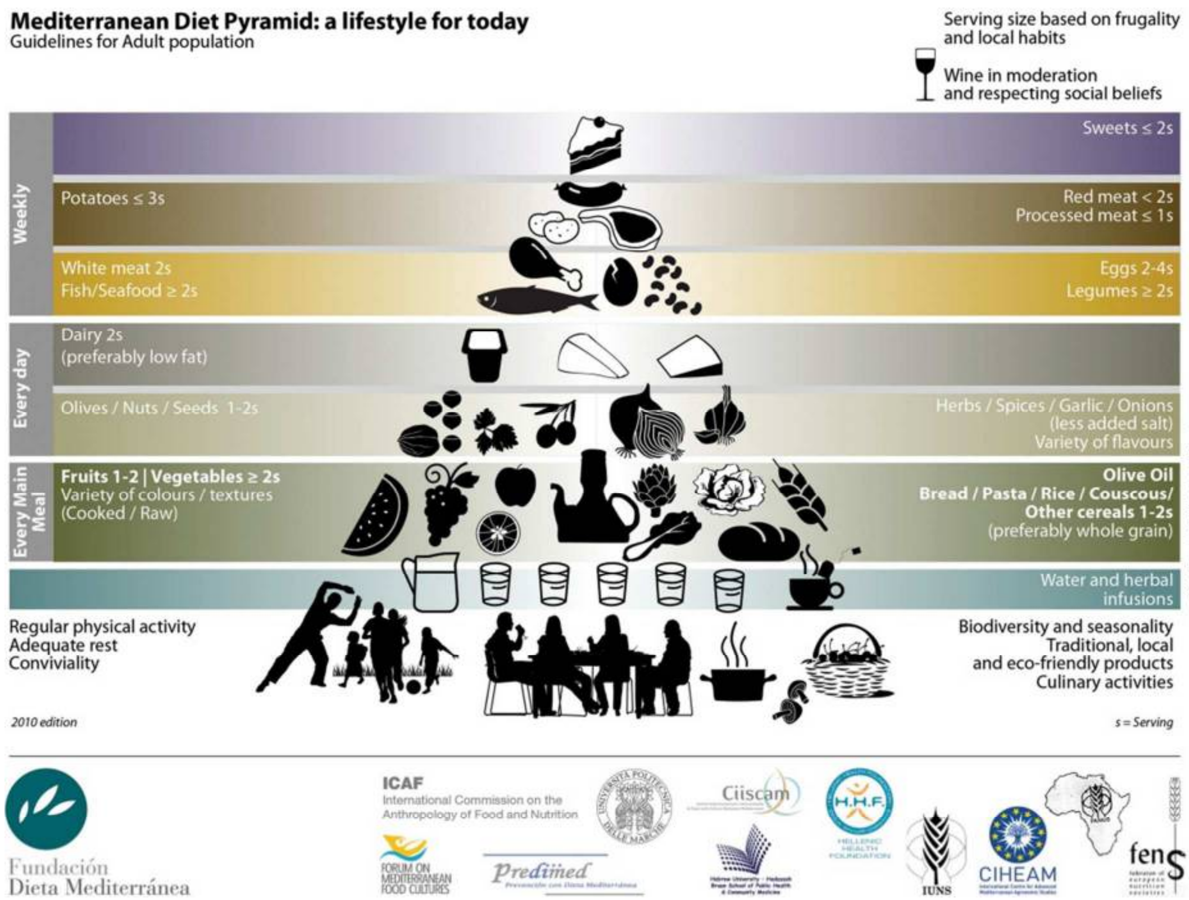

Figure 1. The new Mediterranean diet pyramid: from an international consensus coordinated by the Mediterranean Diet Foundation

Source: (Serra-Majem *et al.,* 2012; Dernini and Berry, 2015).

Table 1. The Main Events of Human Evolution

Millions of years ago	Epoch	Development	
0.0002		Industrial revolution	
	Holocene		
0.01		Agricultural revolution	
	Latest Pleistocene		
0.045		*Homo Sapiens Sapiens*	
	Late Pleistocene		Paleolithic period (from first manufacture of stone tools to shortly before the development of agriculture)
0.080		*H. Sapiens neanderthalensis* appears	
	Middle Pleistocene		
0.400		Archaic H. Sapiens appears	
1.60	Early Pleistocene	*H. erectus* present	
2.0		*H. habilis* present	
	Pleistocene		
4.5		Australopithecine divergence, Bipedal *Australopithecus, afarensis* present	
	Late Miocene		
7.5		Homonid-pongid divergence	
11			
	Middle Miocene	African and Asian Hominoids diverge	
17			
	Early Miocene	Hominoid radiation begins	
24			

Source: (Eaton and Konner, 1985)

Table 2. Food groups among the different Mediterranean countries

	Bread	Pasta	Other cereals	Fruit	Vegetables	Fish	Legumes	Cheese	Wine	Olive oil
Italy	√	√	+	++	++	++	+	+	++	√
Greece	√	-	+	++	√	++	+	√	+	√
France	√	-	+	+	++	+	+	√	√	++
Spain	+	+	+	++	++	++	+	+	+	√
North Africa	+	-	√	+	++	+	++	+	-	++
East basin	+	-	++	+	++	+	+	+	-	++

-, not common; +, moderately common; ++, highly common; √, peculiar.

Source: (Sofi, 2009)