

Chapter 2

Mediterranean Diet and Lifestyle in a Modern World Context

Donato F. Romagnolo and Ornella I. Selmin

Key Points

- Nutrition and lifestyle have been shown to impact the etiology of major causes of death including heart, malignant neoplasms, chronic lower respiratory, cerebrovascular, Alzheimer's, and diabetes diseases. The death incidence attributable to these causes is projected to increase due to the growing and aging population. Socioeconomic constraints contribute to the coexistence of non-communicable diseases with food insecurity.
- The rampant increase in the prevalence of overweight and obesity in the US and world populations have been attributed to a combination of dietary, socioeconomic, and behavioral causes. These include increases in calories consumed; greater average carbohydrate intake, larger portion sizes, greater food quantity and calories per meal; and transition to a more sedentary lifestyle. During the last three decades, various graphical representation (pyramids, plates) have been adopted by US, international, and world health organizations to promote better food selections and lifestyles.
- An imbalance between recommendations and dietary behavior combined with an increasingly sedentary lifestyle likely contribute, along with socioeconomic factors, to the overweight and obesity epidemic in the USA and other countries.
- Recently dietary guidelines in the USA and abroad promote the idea of rebalancing calories with more physical activity to manage weight and reduce the burden of chronic diseases.
- Research evidence suggests that dietary habits and lifestyle of populations residing in Mediterranean countries may offer protection against chronic diseases and improve longevity. The Scientific Report of the 2015 Dietary Guidelines to the DHHS and USDA included the Mediterranean-style Pattern among those associated with health benefits.

Keywords Chronic diseases • Diet • Lifestyle • Food pyramid • Mediterranean diet • Prevention • Health

D.F. Romagnolo, Ph.D., M.Sc. (✉) • O.I. Selmin, Ph.D.
Department of Nutritional Sciences, Shantz Bldg, The University of Arizona,
Tucson, AZ 85721, USA
e-mail: donato@u.arizona.edu; selmin@u.arizona.edu

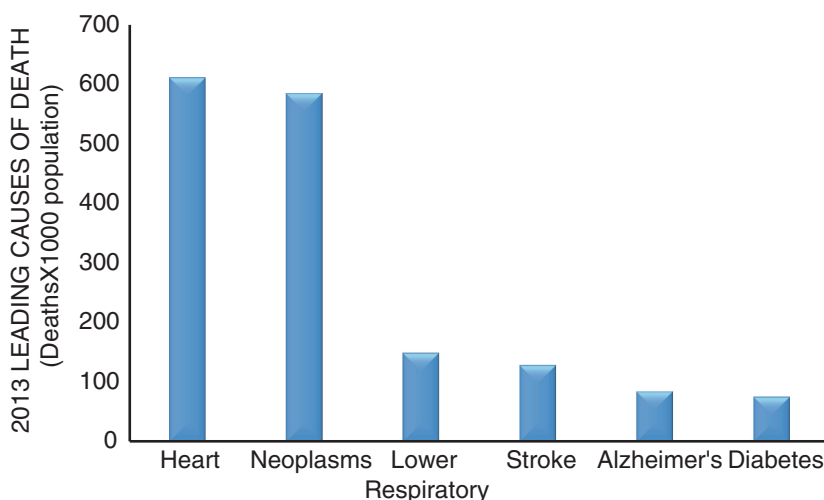
Introduction

Health Trends in the USA and the World

Major causes of death in the USA include heart, malignant neoplasms, chronic lower respiratory, cerebrovascular, Alzheimer's, and diabetes diseases [1] (Fig. 2.1). Unfortunately, coupled to improved longevity are projections suggesting that chronic disease burden will increase markedly with the growing and aging population. For example, whereas US total life expectancy increased by 0.1 year from 78.7 years in 2011 [2], cancer incidence is projected to increase for US populations ranging from 65 to 74 years of age and to a larger degree for subjects 75 year of age and older [3]. Nutrition and lifestyle have been shown to impact the etiology of chronic diseases. For example, it has been estimated that a healthy diet may reduce ~30 % of all cancers [4]. Healthy diet can reduce heart disease by 80 %, and stroke and some cancers by 70 %. Importantly, evidence that there is a 20–30 years lag-period between initial insult and death for most types of cancer suggests that vast opportunities may exist for cancer prevention. Similarly, dietary efforts to reduce the burden of cardiovascular disease have focused on limiting the intake of refined carbohydrates and excess adiposity [5].

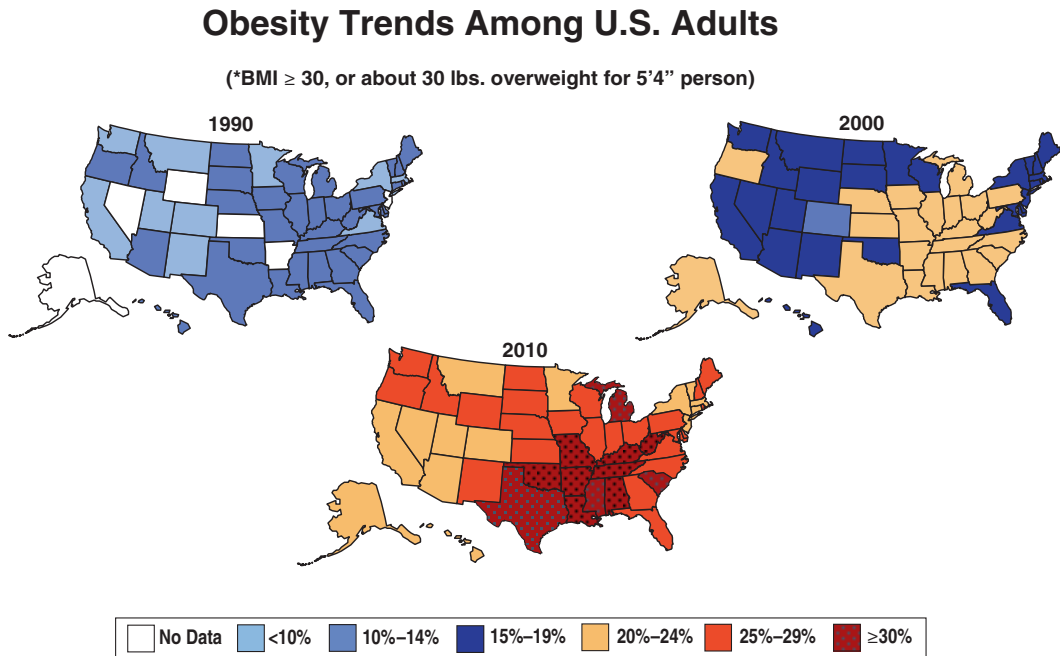
Overweight and Obesity

The prevalence of combined overweight and obesity in US adults (≥ 20 years of age) is ~155 million, which in 2010, represent ~68 % of this group (Fig. 2.2). Fully, ~36 % of US adults are obese. Men and women of all race/ethnic groups in the population appear to be affected by the epidemic of overweight and obesity [6]. Obesity (body mass index, BMI ≥ 30 kg/m², or about 30 lb overweight for 5'4" person) is associated with marked excess mortality in the USA. Even more concerning is the excess



Source: Center for Disease Control and prevention. Deaths Final Data 2013.

Fig. 2.1 Leading causes of death in the USA. Bars represent numbers of deaths \times 1000 population in 2013 for various chronic diseases [1]



Source: Behavioral Risk Factors Surveillance System, Center for Disease Control and Prevention.

Fig. 2.2 Obesity trends among US adults. Diagrams represent obesity trends in 1990, 2000, 2010 [6]

morbidity associated with overweight and obesity in terms of risk factor development and incidence of diabetes mellitus, cardiovascular end points (including coronary heart disease, stroke, and heart failure), and various health conditions such as asthma, cancer, end-stage renal disease, and degenerative joint disease. Obesity and overweight account for ~15–20 % of cancer deaths in the USA [7]. Among children 2–19 years of age, ~32 % are overweight and obese (which represents ~24 million children) and ~17.0 % are obese (12.7 million children). According to the National Center for Health Statistics (NCHS), the prevalence of obesity among US children and adolescents aged 2–19 during the last three decades (1963–1965 through 2007–2012) has nearly tripled [8]. Although the prevalence of obesity among children aged 2–5 years decreased significantly from 13.9 % in 2003–2004 to 8.4 % in 2011–2012, race-specific and socioeconomic factors contribute to some disparities in the prevalence of obesity. For example, obesity is higher for Black (~50 %) and Hispanic (~39 %) compared to White (34 %) Americans. Mexican American boys and girls and African American girls are disproportionately affected with higher incidence rates of obesity compared to other ethnic groups.

Obesity Epidemic and Food Insecurity

The shift from rural food-producing to urbanized lifestyle coupled with economic constraints has contributed to the paradoxical coexistence of obesity with food insecurity [9]. Population studies suggested that food insecurity was a problem with nearly 15 % of American households unable to secure adequate food to meet their nutrition needs [10]. Remarkably, the highest incidence of obesity occurs among poor and least educated groups for which an inverse relationship between energy density and

cost favor the consumption of low-cost energy-dense foods (i.e., refined grains, added sugars, and fats) [11] over healthier and more expensive ones (i.e., fish, fruits, and vegetables). As a result, any food-assistance and recommendation program aimed at reducing the incidence of obesity and related chronic diseases may not achieve its full potential until changes in socioeconomic variables occur, i.e., adequate foods, lifestyle, education, and medical care become accessible to under-privileged communities. These societal needs are in stark contrast with the fact that ~15 % of US adults have used a weight-loss dietary supplement at some point in their lives, with more women reporting use (20.6 %) than men (9.7 %). To lose weight is one of the top 20 reasons why people take dietary supplements. Approximately \$2 billion a year are spent on weight-loss dietary supplements in pill form (e.g., tablets, capsules, and softgels) [12].

Global comparisons of obesity prevalence showed that among developed countries the USA ranked first (~33 %) followed by Canada, Australia, and the UK (~28 %) (Fig. 2.1) [13]. High prevalence ranging from 33 to 42 % was also found in North African countries including Kuwait, Lybia, Qatar, and Saudi Arabia. Intermediate prevalence was observed in Central (Mexico, 28 %), South America (20–26 %), Russia and France (~24 %), Italy and Sweden (~21 %). Significantly lower prevalence was found in China (7 %) and India (5 %). Estimates from WHO indicated that worldwide obesity more than doubled since 1980. In 2014, more than 1.9 billion adults, 18 years and older, were overweight. Of these people, over 600 million were obese. In 2014, about 39 % of world adults aged 18 years and over were estimated to be overweight, and 13 % were likely obese. Remarkably, in countries where most of the world's population lives, overweight and obesity conditions contribute to mortality more than underweight and malnutrition. It was estimated that 42 million children under the age of 5 were overweight or obese in 2013. Strikingly, the rate of increase of childhood overweight and obesity has been higher in developing countries with emerging economies compared to that of developed nations.

The rampant increase in the prevalence of overweight and obesity in the US and world populations have been attributed to a combination of dietary, socioeconomic, and behavioral causes. These include increases in calories consumed; greater average carbohydrate intake, in particular, of starches, refined grains, and sugars; larger portion sizes, greater food quantity and calories per meal; increased consumption of sugar-sweetened beverages, snacks, commercially prepared meals, and higher energy-density foods; food insecurity and transition to a more sedentary lifestyle [14]. Data from the US National Health and Nutrition Examination Survey [15] indicated that between 1971 and 2000, the average total energy consumption among US adults increased by 22 % in women (from 1542 to 1886 kcal/d) and by 10 % in men (from 2450 to 2693 kcal/d). During the same period, higher prevalence in overweight and obesity in the USA have occurred in spite of an overall reduction in dietary fat intake as a percentage of caloric intake [16, 17]. In support of this, epidemiological studies showed that a reduction in saturated fatty acid intake below ~10 % of total energy intake was not associated with a lower risk of cardiovascular diseases and may actually favor carbohydrates intake [5]. These cumulative data point to excessive carbohydrates, rather than fat, as a contributing cause for the obesity epidemic and likely worsening of metabolic states characterized by increased triglycerides and reduced HDL cholesterol.

Diabetes

Obesity is a condition that predisposes to the development of diabetes. Epidemiological studies of diabetes suggest it is a major cause of stroke and heart disease [18]. In the USA, the number of subjects diagnosed with diabetes has increased steadily since early 1990s. In 2012, 29.1 million Americans, or ~9.5 % of the population, had diabetes. Of these, approximately 1.25 million American children and adults (~5 % of total cases) have type 1 diabetes whereas type 2 diabetes is the prevalent

form. The prevalence of diabetes in the USA varies with race and ethnicity with Mexican Americans and non-Hispanic Blacks contributing ~13 % of diagnosed diabetes cases from 2007 to 2009 compared to a lower ~7–8 % for non-Hispanic Whites and Asian Americans. Mexican Americans residing in the USA have a 50 % lifetime risk of diabetes [19]. Although the prevalence of diabetes in senior Americans (age 65 and older) remains relatively high (~26 %) recent statistics suggested that the estimated number of new cases of diagnosed diabetes was the highest among younger adults (45–64 years of age) [18] compared to older groups. This is particularly troubling considering that in subject with diabetes the mortality related to cardiovascular diseases nearly doubles [20]. The dramatic incidence of diabetes in younger adults clearly points to poor dietary and lifestyle practices as major targets for prevention.

Food Recommendations

Food Groups and Pyramids

Evidence of dietary guidelines in the USA trace back to more than hundred years ago when in 1894 the US Department of Agriculture (USDA) emphasized the importance of variety, proportionality and moderation in food selection [21] (Fig. 2.3). From the early- to mid-1900s, the USDA issued various recommendations based on food group guidelines which remained in use until the 1970s. It was not until 1970s that the focus of recommendations shifted from securing adequate nutrition to prevention of chronic diseases due over consumption. In 1980, the first edition of the Dietary Guidelines highlighted recommendations for five major groups including the bread, cereal, rice and pasta group; the vegetable group; the fruit group, the dairy (milk, yogurt, and cheese); the protein (meat, poultry, fish, dry beans, eggs) and nuts group; and the fats, oils, and sweets group. Since 1980, the USDA and Department of Human Health Services (DHHS) released Dietary Guidelines that in 1990 included percent targets for total fat (30 % of calories) and saturated fat (less than 10 % of calories) [22]. In 1992, the USDA released the first Food Pyramid to help Americans to choose healthy diets [23] (Fig. 2.3). The term pyramid, which derives from the Greek “pyramis,” refers to pointy structures characterized by a quadrilateral base and a rising triangular top. It is commonly associated with ancient tombs of Egyptian pharaohs [24] and other civilizations in Mesoamerica [25] and India [26]. The concept of pyramid has often been used in sociology and economics to represent inequities by including at the base the poorest groups with fewer resources and power, and at the top, the more affluent and smaller groups [27]. Based on this stratification, the graphical representation of the pyramid was adopted by the USDA to place on top oils and sweets to suggest that they should be used sparingly. Then, below and in increasing order of consumption, the pyramid included horizontal sections representing the dairy group (milk, yogurt, and cheese); protein (meat, poultry, fish, eggs, dry beans) and nuts group; vegetable and fruit group; and at the bottom of the pyramid, to suggest larger consumption, the bread, cereal, rice and pasta group (Fig. 2.3). Unfortunately, the fact that Americans consumed fewer servings for the grain, vegetable, and fruit groups, and nearly triple the recommended added sugars [28] revealed a disconnect between food pyramid recommendations and consumer knowledge and behavior [29]. This imbalance between recommendations and dietary behavior combined with an increasingly sedentary lifestyle are at the basis, among other factors, of the overweight and obesity epidemic in the USA, and possibly other communities leaving abroad but under similar socioeconomic conditions. A subject of concern regarding the 1992 Food Pyramid was its replacement of fats without discriminating bad vs. good ones (i.e., saturated vs mono and polyunsaturated) thus likely favoring increase intakes of other food sources (i.e., carbohydrates) to meet energy needs [30].



Fig. 2.3 Selected US food guides and pyramids. Pictures represent graphical representations of selected food guides and pyramids published by the US Department of Agriculture [50]. The current food guide for Americans is MyPlate issued in 2010 [36]

In 2004, the World Health Organization (WHO) released the Global Strategy on Diet, Physical Activity and Health (GSDPAH) [31] to address the needs for promoting healthy diets and regular physical activity, and to prevent non-communicable diseases. A central tenet of this initiative was evidence that unhealthy diets and physical inactivity were among the leading causes of major non-communicable diseases, such as cardiovascular disease, type 2 diabetes, and certain types of cancer, and contributed substantially to the global burden of disease, death and disability in the world. Moreover, the WHO-GSDPAH recognized that patterns of unhealthy behavior and the non-communicable diseases associated with them clustered with poor communities and hampered their social and economic development. Also, in the poorest countries, where infectious diseases and undernutrition were found to dominate disease burden, the prevalence of overweight and obesity paralleled the increasing trends of overweight and obesity of low-income groups in developed countries.

In 2005, the USDA launched “MyPyramid,” which compared to the 1992 food pyramid, adopted colored vertical, rather than horizontal, stripes of different size to depict the contribution of each food group [21]. In addition, the “MyPyramid” logo included a stair to highlight the importance of physical activity. Specific recommendations were to limit fat intake (20–35 % energy) to vegetable oils, and energy intake. Early reviews recognized that the 2005 food pyramid provided improved guidelines for less energy and more adequate nutrient intake, but also anticipated that without discretionary energy restriction Americans would be at risk of excessive energy intake [32]. Also, concerns were raised over the high recommended intakes of red meat, dairy products, and refined starches [30] and the overall promotion of a low-fat diet. As a result, alternative health eating indexes [33] and pyramids [34] were proposed to better predict risk of diseases and encourage a reduction in the intake of saturated fats, refined starches, and exclude trans-fatty acids.

From Pyramids to Plates

The 2010 Dietary Guidelines were designed to help people choose a healthier diet [35]. It reinforced the idea of balancing calories with physical activity to manage weight; consuming more fruits, vegetables, whole grains, vegetable oils (MUFA and PUFA), fat-free and low-fat dairy products, and seafood; and consuming fewer foods with sodium (salt), saturated and trans-fats, cholesterol, added sugars, and refined grains. The USDA replaced the graphical concept of pyramid with “MyPlate” illustrating on a plate the five food groups that should be the building blocks for a healthy diet [36]. In light of the burgeoning of overweight and obesity among people residing in the USA concerns persist about difficulties to promote and define proper adherence to healthier dietary patterns. The fact that people may continue to eat more of certain, but not healthier, foods (e.g., solid fats and added sugars) as in the past is a major challenge against the fight on overweight and obesity and prevention of related chronic diseases [37].

Mediterranean Diet and Lifestyle

Scientific Report of the 2015 Dietary Guidelines to the DHHS and USDA

In its Scientific Report of the 2015 Dietary Guidelines to the DHHS and USDA [38], the Advisory Committee recognized that dietary patterns of the American public are suboptimal and casually related to poor individual and population health, higher chronic disease rates, whereas a significant portion of the households suffers from food insecurity. Suggested targets for dietary recommendations included increasing consumption of fruits, vegetables, and whole grains; reduce intake of calories, saturated fat, sodium, refined grains, and added sugars. Moreover, under consumption of vitamin D, calcium, potassium, and fiber were identified as of public concern for the majority of the US population. At the time of preparation of this volume, the 2015 Scientific Report to the DHHS and USDA is being translated into the 2015 Dietary Guidelines for Americans. In its summary statement, the Advisory Committee concluded that it had enough descriptive information, from existing research and data, to model three dietary patterns and examine their nutritional adequacy. These included the Healthy US-Style Pattern, the Healthy Mediterranean-Style Pattern, and the Healthy Vegetarian Pattern based on the evidence they included the food and components of a dietary pattern associated with health benefits.

Research evidence suggests that dietary habits and lifestyle of populations residing in Mediterranean countries may offer protection against chronic diseases, i.e., cardiovascular diseases [39] and improve longevity [40]. Some of the health protective effects of the Mediterranean diet and lifestyle have been attributed to high levels of polyphenols which are abundant in fruits and vegetables. Interestingly, the lower rates of coronary heart disease in the Mediterranean region were found [41, 42] where fat intake was relatively high (35–40 %), but mostly from olive oil (70–80 % of the MUFA oleic acid). These data of fat consumption in Mediterranean populations raise the provocative question whether or not recommending diets low in fat, and the widespread availability of zero- or low-fat foods, may be compensated with higher intakes of refined starches and sugars, and actually contribute to the burden of chronic diseases (e.g., overweight, obesity). For example, controlled feeding studies showed that compared to carbohydrates, both monounsaturated (MUFA) and polyunsaturated (PUFA) fats in Mediterranean diets reduced LDL and triglycerides and increase HDL cholesterol [43]. Importantly, these metabolic effects were greater in subjects with underlying insulin resistance. Earlier studies showed that a total fat intake of ~35–40 % energy, with mono and polyunsaturated fatty acids and saturated fatty acids contributing ~20–30 % and 9 % energy, respectively, reduced the risk of

cardiovascular diseases [44, 45]. Therefore, the question dietary prescription of further reducing saturated fatty acids (i.e., below ~10 %) may not be beneficial and actually increase the proportion of carbohydrates while reducing the potential health benefits of fatty acids found in dairy products (i.e., conjugated linoleic acid). Thus, specific contributions of various dietary fatty acids need to be taken into consideration when making recommendations about dietary fat intake. For example, the predominant unsaturated fatty acids present in olive oil (18:1) and fish (EPA, DHA) cannot be equated to those in soy and corn that are rich in linoleic acid (18:2) and for which some evidence of obesogenic and diabetogenic effects have been observed in preclinical studies compared to coconut oil rich in saturated fatty acid [46]. Other examples of beneficial bioactive compounds commonly present in Mediterranean diets include fiber (whole grains) and polyphenols (fruits, vegetables, wine and berries). For example, studies showed that wine in moderation has a positive effect; however, too much has a negative effect on mortality due to all causes and cardiovascular diseases [39]. A diet that includes moderate alcohol consumption, primarily with meals and physical activity are central components of the Mediterranean lifestyle.

During the last decade, the health effects of foods and bioactive food components present in Mediterranean diets have been the subject of intense investigations. Figure 2.4 depicts the number of publications appeared in PubMed since 1995 and cited in two time periods, from 1995 to 2004 and from 2005 to 2015, for Mediterranean diet and each disease. Not surprisingly, studies of cardiovascular diseases contributed the highest number of citations during both periods, but clearly there has been a marked increase in research publications for all five chronic diseases in conjunction with the increased incidence of overweight and obesity. The Mediterranean Diet was inscribed by UNESCO in 2013 [47] in the Representative List of the Intangible Cultural Heritage of Humanity. The editors and contributors of this volume recognize that other dietary patterns and lifestyles can promote health and protect against chronic diseases [48, 49]. However, due to the vast literature and limited space, the

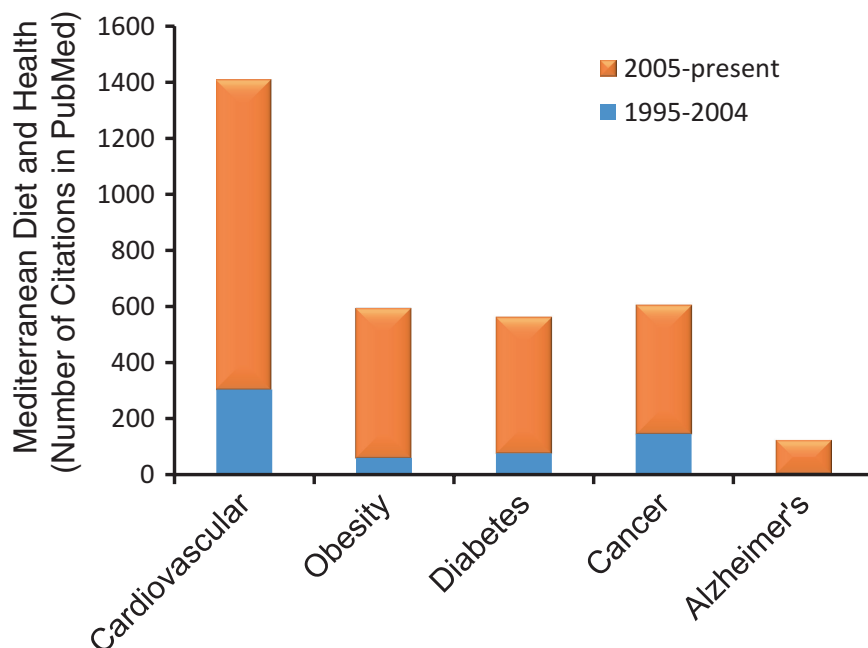


Fig. 2.4 Publications on Mediterranean diet and health during the last 20 years. Bars represent number of citations in PubMed for two time periods (1995–2004 and 2005–present) for combinations of Mediterranean diet and specific chronic diseases

main focus of this volume is to summarize the most up-to-date evidence related to the potential benefits of foods and dietary behaviors that are characteristic of the Mediterranean region with special emphasis on socioeconomics and practices that contribute to the Mediterranean diet and lifestyle; the mechanisms through which bioactive compounds usually found in Mediterranean diets and foods impact on biological process; and opportunities and challenges for implementation of a Mediterranean-like dietary pattern in developed and emerging economies. The volume closes with a chapter presenting example of recipes and their nutritional composition.

Summary and Conclusions

In the USA and the world the establishment of dietary guidance based on food groups finds its roots in traditions concerning agricultural production, culinary activities and healthy eating, and community development [50]. Ethnic and cultural guidelines [51] have been the focus of intense study during the last two decades because of the causative role of diet and behavior on the development of major chronic non-communicable diseases. In spite of intense efforts by various US, international, and World Health Organization there appear to be little or no progress on the fight against overweight and obesity and related chronic diseases (i.e., cancer, diabetes, cardiovascular). Major research efforts and lifestyle changes are needed to reverse these trends in the USA and communities abroad but affected by similar health burdens (Table 2.1). Adoption of dietary patterns and lifestyles that have been traditionally associated with reduced incidence of chronic diseases are recommended. Implementation of these changes, such as a Mediterranean diet and lifestyle may offer some benefits to populations residing in the USA and abroad [52]. Major challenges include Westernization of food supplies [53], and lifestyle and socioeconomic constraints that limit access to healthier foods, affordable education, and medical care.

Table 2.1 Areas of investigation and specific research needs^a

<i>1. Food and nutrient intakes and health</i>	
–	Include more respondents from race/ethnic minorities and non-US born residents
–	Include higher proportion of older Americans and pregnant women
–	Conduct research on early-life nutrition and dietary patterns
–	Increase the quantity and quality of food composition databases and develop new biomarkers of intake and nutritional status
–	Evaluate effects of fortification strategies and supplement use and their doses (i.e., Ca, Fe, vitamin D, K, fiber)
–	Develop research definition for meals and snacks
–	Develop concept of dietary patterns and approaches to quantify nutrients, foods, and food groups in population-based studies
–	Conduct surveillance on the prevalence and trends of nutrition-related chronic diseases
<i>2. Dietary patterns, foods and nutrients, and health outcomes</i>	
–	Study dietary patterns research for other health outcomes beyond cardiovascular disease and body weight in relation to ethnic backgrounds and life course stages
–	Develop modeling of food patterns
–	Study long-term cardio-metabolic effects of the various dietary patterns
<i>3. Individual diet and physical activity behavior</i>	
–	Collect and characterize types of eating venues (i.e., eating out vs eating at home) and longitudinal impact
–	Assess sedentary behaviors and activities and impact on variables of health (i.e., overweight, obesity) across the life span

(continued)

Table 2.1 (continued)

– Assess types, modalities, and frequencies of self-monitoring and counseling on weight loss intervention and maintenance in various ethnic/racial groups and minorities
– Examine effects of mobile health technologies on dietary and weight outcomes
– Establish impact of current, and needs for novel, food labeling across various settings (i.e., home, restaurants, etc.)
– Establish impact of socioeconomic constraints on food insecurity on health parameters
– Determine the impact of acculturation on dietary intake, sedentary behaviors, body weight, and chronic disease outcomes
– Investigate the relationships dietary and energy intake, and energy expenditure on sleep patterns and body weight outcomes
4. Food environment
– Measure all aspects of the food environment increasing healthy food access
– Implement better research methods in obesity intervention research and in child care settings
– Improve knowledge regarding food procurement and practices
– Study daily food behavior of children at school in relation to food policies and outside of school
– Study long term health impact of food interventions and to increase vegetables consumption
– Assess worksite interventions across racially/ethnically diverse populations
5. Food sustainability and safety
– Determine affordability and accessibility of foods to various sectors of the population
– Perform analyses of US domestic dietary patterns and sustainability
– Study how agricultural production and consumer behaviors influence sustainability of food practices and economic benefits and challenges
– Improve nutrient profiles of high- and of low-trophic farmed seafood and production efficiency
– Develop methods to ensure control of contaminant levels in all seafood
– Examine effect of low and high levels of coffee on health outcomes (pregnancy, sleep, cancer, cognitive, cardiovascular, diabetes) and in children and adults
– Examine the risks of aspartame related to some cancers
6. Cross-cutting public health topics
– Design studies with sufficient power
– Assess efficacy of methodologies for sample collections (e.g., 24-h urine collections)
– Link behavioral interventions to adherence to sodium intake recommendations (i.e., low vs. high, portion size)
– Impact of substitution of saturated fats with different carbohydrates (e.g., refined vs. whole grains) or various polyunsaturated fats and oils on cardiovascular disease
– Examine gene–nutrient interactions
– Assess levels of sugars and low-calorie sweeteners and link to health outcomes in general population and subgroups, and policies to reduce their intakes
– Assess implementation of front-of-package labeling
7. Physical activity
– Assess best practices to reduce sedentary life and increase physical activity (duration, frequency, type)
– Establish health impact of physical activity for children, older adults and population at large across the lifespan

^aSource: US Department of Agriculture, Scientific Report of the 2015 Dietary Guidelines for Americans, Appendix E1 [38]

References

- Center for Disease Control and Prevention. Detailed tables for the national vital statistics report (NVSr); deaths: final data for 2013. <http://www.cdc.gov/nchs/fastats/deaths.htm>. Accessed 10 Sep 2015.
- Xu J, Kochanek KD, Murphy SL, Arias E. Mortality in the United States, U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. NCHS Data Brief No. 2012;128:1–7.
- Cancer Trends Progress Report, National Cancer Institute, NIH, DHHS, Bethesda, MD, March 2015. <http://progressreport.cancer.gov>. Accessed 10 Sep 2015.
- World Cancer Research Fund/American Institute for Cancer Research. Food, nutrition, physical activity, and the prevention of cancer: a global perspective. Washington, DC: AICR; 2007.
- Siri-Tarino PW, Sun Q, Hu FB, Krauss RM. Saturated fat, carbohydrate, and cardiovascular disease. *Am J Clin Nutr*. 2010;91:502–9.
- U.S. Department of Health and Human Services, National Institute of Diabetes and Digestive and Kidney Diseases. Overweight and obesity statistics. <http://www.niddk.nih.gov/health-information/health-statistics/Pages/overweight-obesity-statistics.aspx>. Accessed 10 Sep 2015.
- Alberts DS, Lloria-Prevatt M. Foreword. In: Milner JA, Romagnolo DF, editors. Bioactive compounds and cancer. New York, NY: Humana Press-Springer Science; 2013.
- Center for Disease Control and Prevention, National Center for Health Statistics, Childhood obesity facts. <http://www.cdc.gov/obesity/data/childhood.html>. Accessed 10 Sep 2015.
- Hruschka DJ. Do economic constraints on food choice make people fat? A critical review of two hypotheses for the poverty-obesity paradox. *Am J Hum Biol*. 2012;24:277–85.
- Gooze RA, Hughes CC, Finkelstein DM, Whitaker RC. Obesity and food insecurity at the same table: how head start programs respond. *Prev Chronic Dis*. 2012;9, E132.
- Drewnowski A, Specter SE. Poverty and obesity: the role of energy density and energy costs. *Am J Clin Nutr*. 2004;79:6–16.
- U.S. Department of Health and Human Services, National Institutes of Health, Office of Dietary Supplements. Dietary supplements for weight loss. <https://ods.od.nih.gov/factsheets/WeightLoss-HealthProfessional>. Accessed 10 Sep 2015.
- World Health Statistics. World Health Organization. Organization, 2015. http://www.who.int/gho/publications/world_health_statistics/2015/en/. Accessed 10 Sep 2015.
- U.S. Department of Health and Human Services, National Institute of Diabetes and Digestive and Kidney Diseases. Understanding adult overweight and obesity. <http://www.niddk.nih.gov/health-information/health-topics/weight-control>. Accessed 7 Sep 2015.
- Center for Disease Control and Prevention. Trends in intake of energy and macronutrients, United States, 1971–2000, Morbidity Mortality Weekly Report. 53(4), February 6, 2004. <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5304a3.htm>. Accessed 1 Sep 2015.
- Chanmugam P, Guthrie JF, Cecilio S, Morton JF, Basiotis PP, Anand R. Did fat intake in the United States really decline between 1989–1991 and 1994–1996? *J Am Diet Assoc*. 2003;103(7):867–72.
- Willett WC. Is dietary fat a major determinant of body fat? *Am J Clin Nutr*. 1998;67(3 Suppl):556S–62S. Review. Erratum in: *Am J Clin Nutr* 1999;70(2):304.
- Centers for Disease Control and Prevention. National diabetes statistics report: estimates of diabetes and its burden in the United States. Atlanta, GA: U.S. Department of Health and Human Services; 2014.
- Fisher-Hoch SP, Vatcheva KP, Rahbar MH, McCormick JB. Undiagnosed diabetes and pre-diabetes in health disparities. *PLoS One*. 2015;10(7):e0133135. doi:10.1371/journal.pone.0133135.
- Gregg EW, Cheng YJ, Saydah S, Cowie C, Garfield S, Geiss L, Barker L. Trends in death rates among U.S. adults with and without diabetes between 1997 and 2006: findings from the National Health Interview Survey. *Diabetes Care*. 2010;35:1252–7.
- Davis C, Saltos E. Dietary recommendations and how they have changed over time. In: America's eating habits, United States Department of Agriculture, Agriculture Information Bulletin No. (AIB-750). 1999:33–50. <http://www.ers.usda.gov/publications/aib-agricultural-information-bulletin/aib750.aspx>. Accessed 7 Sep 2015.
- U.S. Department of Agriculture and U.S. Department of Health and Human Services: dietary guidelines for Americans, 2005. 6th ed. Washington, DC: US Government Printing Office; 2005. www.dietaryguidelines.com. Accessed 10 Sep 2015.
- U.S. Department of Agriculture Food Pyramid. 1992. <http://www.nal.usda.gov/fnic/Fpyr/pymid.gif>.
- National Geographic: Egypt—Great Pyramid of Khufu at Giza. <http://nationalgeographic.com>. Accessed 1 Sep 2015.
- Harner M. The Enigma of Aztec sacrifice. *Natural History*. 1977;86(4):46–51.
- UNESCO, World Heritage Convention, World Heritage Committee. Evaluation of cultural properties, International Council on Monuments and Sites. June 28–July 2004, Suzhou, China. <http://whc.unesco.org/archive/2004/whc04-28com-inf14ae.pdf>. Accessed 8 Sep 2015.

27. Krieger N. Ladders, pyramids and champagne: the iconography of health inequities. *J Epidemiol Community Health*. 2008;62:1098–104.
28. Putnam J, Allshouse J, Kantor LS. U.S. per capita food supply trends: more calories, refined carbohydrates and fats. *Food Rev*. 2002;25:2–15.
29. Goldberg JP, Belury MA, Elam P, Finn SC, Hayes D, Lyle R, St Jeor S, Warren M, Hellwig JP. The obesity crisis: don't blame it on the pyramid. *J Am Diet Assoc*. 2004;104:1141–7.
30. Chiuve SE, Willett WC. The 2005 Food Guide Pyramid: an opportunity lost? *Nat Clin Pract Cardiovasc Med*. 2007;4(11):610–20.
31. World Health Assembly 57.17. Global strategy on diet and physical activity. Geneva: World Health Organization; 2004.
32. Gao X, Wilde PE, Lichtenstein AH, Tucker KL. The 2005 USDA Food Guide Pyramid is associated with more adequate nutrient intakes within energy constraints than the 1992 Pyramid. *J Nutr*. 2006;136(5):1341–6.
33. Willett WC, McCullough ML. Dietary pattern analysis for the evaluation of dietary guidelines. *Asia Pac J Clin Nutr*. 2008;17 Suppl 1:75–8.
34. Willett W. Eat, drink and be healthy. New York: Simon and Schuster; 2005.
35. U.S. Department of Agriculture and U.S. Department of Health and Human Services: dietary guidelines for Americans, 2010. 7th ed. Washington, DC: US Government Printing Office; 2010. www.dietaryguidelines.com. Accessed 8 Sep 2015.
36. U.S. Department of Agriculture. ChooseMyPlate. <http://www.choosemyplate.gov>.
37. Jahns L, Kranz S. High proportions of foods recommended for consumption by United States Dietary Guidance contain solid fats and added sugar: results from the National Health and Nutrition Examination Survey (2007–2008). *Nutr J*. 2014;20:13–23.
38. U.S. Department of Agriculture. Scientific report of the 2015 Dietary Guidelines Advisory Committee to the Secretary of Agriculture and the Secretary of Health and Human Services. <http://health.gov/dietaryguidelines/2015-scientific-report>. Accessed 15 Aug 2015.
39. Cordova AC, Sumpio BJ, Sumpio BE. Perfecting the plate: adding cardioprotective compounds to the diet. *J Am Coll Surg*. 2012;214:97–114.
40. Trichopoulou A, Kouris-Blazos A, Wahlqvist ML, Gnardellis C, Lagiou P, Polychronopoulos E, Vassilakou T, Lipworth L, Trichopoulos D. Diet and overall survival in elderly people. *BMJ*. 1995;311(7018):1457–60.
41. Covas MI, et al. Perfecting the plate: adding cardioprotective compounds to the diet. *Ann Intern Med*. 2006;145:333–41.
42. De Lorgeril M, Salen P, Martin JL, Mamelle N, Monjaud I, Touboul P, Delaye J. Effect of a mediterranean type of diet on the rate of cardiovascular complications in patients with coronary artery disease. Insights into the cardioprotective effect of certain nutriments. *J Am Coll Cardiol*. 1996;28:1103–8.
43. Willett WC. The Mediterranean diet: science and practice. *Public Health Nutr*. 2006;9:105–10.
44. Dayton S, Pearce ML, Hashimoto S, Dixon WJ, Tomiyasu U. A controlled clinical trial of a diet high in unsaturated fat in preventing complications of atherosclerosis. *Circulation*. 1969;39–40 Suppl 2:1–63.
45. Leren P. The Oslo Diet-Heart Study. *Circulation*. 1970;42:935–42.
46. Deol P, Evans JR, Dhahbi J, Chellappa K, Han DS, Spindler S, Sladek FM. Soybean oil is more obesogenic and diabetogenic than coconut oil and fructose in mouse: potential role for the liver. *PLoS One*. 2015;10(7), e0132672.
47. UNESCO. Representative list of the intangible cultural heritage of humanity. 2013. <http://www.unesco.org/culture>. Accessed Sep 2015.
48. National Heart, Lung, and Blood Institute. Your guide to lowering your blood pressure with DASH. NIH Publication no. 06-4082. Bethesda, MD: NIH, National Heart, Lung, and Blood Institute; 2006.
49. Tangney CC. DASH and Mediterranean-type dietary patterns to maintain cognitive health. *Curr Nutr Rep*. 2014;3(1):51–61.
50. A brief history of USDA food guides. <http://fnic.nal.usda.gov/dietary-guidance/dietary-guidelines/historical-dietary-guidance>. Accessed 6 Sep 2015.
51. U.S. Department of Agriculture, Ethnic/Cultural Food Pyramids. <http://fnic.nal.usda.gov/dietary-guidance/past-food-pyramid-materials/ethniccultural-food-pyramids>. Accessed 6 Sep 2015.
52. Bach-Faig A, Berry EM, Lairon D, Reguant J, Trichopoulou A, Dernini S, Medina FX, Battino M, Belahsen R, Miranda G, Serra-Majem L, Mediterranean Diet Foundation Expert Group. Mediterranean diet pyramid today. Science and cultural updates. *Public Health Nutr*. 2011;14:2274–84.
53. Garcia-Closas R, Berenguer A, González CA. Changes in food supply in Mediterranean countries from 1961 to 2001. *Public Health Nutr*. 2006;9:53–60.

Mediterranean Diet

Dietary Guidelines and Impact on Health and Disease

Romagnolo, D.F.; Selmin, O.I. (Eds.)

2016, XXXVII, 321 p. 42 illus., 4 illus. in color., Hardcover

ISBN: 978-3-319-27967-1

A product of Humana Press