

The following is synopsis of The Scientific Report of the 2015 Dietary Guidelines Advisory Committee (DGAC). The original report was prepared as an Advisory Report to the Secretary of Health and Human Services and the Secretary of Agriculture. It is a 571 page report and therefore this synopsis was created to identify the key points for this class. Most information was taken directly from the report. Some additional, clarifying information, has been added. You can see the [full report here](#) if you want to read the entire report or check sources.

This report was used to develop the 2015-2020 Dietary Guidelines for Americans however, because the USDA functions to both create dietary recommendations and also to promote the interests of U.S. agriculture (a clear conflict of interest), many of the recommendations from the DGAC were altered or left out completely. Therefore, this document was created to remove bias and present the evidence based findings of the DGAC.

The rubric below was used in the report to define the level of evidence for certain recommendations. It is shown here for your reference as you read.

USDA Nutrition Evidence Library Conclusion Statement Evaluation Criteria for judging the strength of the body of evidence supporting the Conclusion Statement				
Elements	Grade I: Strong	Grade II: Moderate	Grade III: Limited	Grade IV: Grade Not Assignable*
Risk of bias (as determined using the NEL Bias Assessment Tool)	Studies of strong design free from design flaws, bias and execution problems	Studies of strong design with minor methodological concerns OR only studies of weaker study design for question	Studies of weak design for answering the question OR inconclusive findings due to design flaws, bias or execution problems	Serious design flaws, bias, or execution problems across the body of evidence
Quantity <ul style="list-style-type: none"> Number of studies Number of subjects in studies 	Several good quality studies; large number of subjects studied; studies have sufficiently large sample size for adequate statistical power	Several studies by independent investigators; doubts about adequacy of sample size to avoid Type I and Type II error	Limited number of studies; low number of subjects studied and/or inadequate sample size within studies	Available studies do not directly answer the question OR no studies available
Consistency of findings across studies	Findings generally consistent in direction and size of effect or degree of association and statistical significance with very minor exceptions	Some inconsistency in results across studies in direction and size of effect, degree of association or statistical significance	Unexplained inconsistency among results from different studies	Independent variables and/or outcomes are too disparate to synthesize OR single small study unconfirmed by other studies
Impact <ul style="list-style-type: none"> Directness of studied outcomes Magnitude of effect 	Studied outcome relates directly to the question; size of effect is clinically meaningful	Some study outcomes relate to the question indirectly; some doubt about the clinical significance of the effect	Most studied outcomes relate to the question indirectly; size of effect is small or lacks clinical significance	Studied outcomes relate to the question indirectly; size of effect cannot be determined
Generalizability to the U.S. population of interest	Studied population, intervention and outcomes are free from serious doubts about generalizability	Minor doubts about generalizability	Serious doubts about generalizability due to narrow or different study population, intervention or outcomes studied	Highly unlikely that the studied population, intervention AND/OR outcomes are generalizable to the population of interest

PREVALENCE OF HEALTH CONDITIONS AND TRENDS

Preventable, diet- and lifestyle-related chronic diseases, including high blood pressure, cardiovascular disease (CVD), type 2 diabetes, and certain cancers, contribute to the high and rising costs of U.S. health care. Adults with overweight or obesity frequently have co-morbid conditions and higher chronic disease risk profiles that contribute substantially to higher health care costs. These health problems are persistent in the population and pose major public health concerns. Increasing rates of overweight and obesity among American youth have resulted in rising rates of CVD risk factors, including borderline high blood pressure and diabetes, in this population. Health disparities in risk profiles and disease rates are evident across racial, ethnic, and income strata. In a new health care and public health vision, prevention of chronic diseases and other lifestyle-related health problems would become a major focus. Examining the status and trends in these health conditions provides a framework for discussing their relationship to dietary intake and lifestyle factors and can help in identifying evidence-based strategies for prevention.

DIETARY PATTERNS COMPOSITION

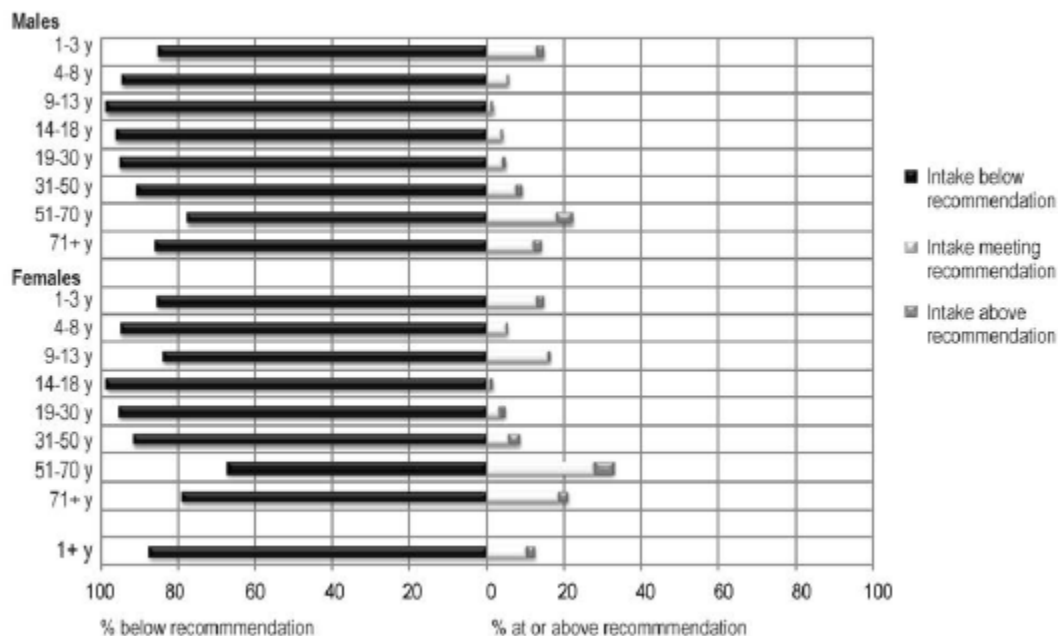
Dietary patterns with positive health benefits are described as high in vegetables, fruit, whole grains, seafood, legumes, and nuts; moderate in low- and non-fat dairy products; lower in red and processed meat; and low in sugar-sweetened foods and beverages and refined grains.

The DGAC conducted data analyses to address a series of questions related to the current status and trends in the Nation's dietary intake. The questions focused on: intake of specific nutrients and food groups; food categories (i.e., foods as consumed) that contribute to intake; eating behaviors; and the composition of various dietary patterns shown to have health benefits, including Mediterranean-style diets, the Healthy US-style and DASH-style diets (DASH stands for Dietary Approaches to Stop Hypertension).

In addition, the DGAC examined the prevalence and trends of health conditions that may have a nutritional origin, or where the course of disease may be influenced by diet. The DGAC found that several nutrients are underconsumed and the Committee characterized them as shortfall nutrients: **vitamin A, vitamin D, vitamin E, vitamin C, folate, calcium, magnesium, fiber, and potassium.** For adolescent and premenopausal females, **iron** also is a shortfall nutrient. Important to note, on the basis of nutrient biomarkers or health outcomes, **calcium, vitamin D, fiber, and potassium** also are classified as nutrients of public health concern because their underconsumption has been linked in the scientific literature to adverse health outcomes. Iron is included as a shortfall nutrient of public health concern for adolescent females and adult females who are premenopausal due to the increased risk of iron-deficiency in these groups. The DGAC also found that two nutrients—**sodium and saturated fat**—are overconsumed by the U.S. population and that the overconsumption poses health risks. The majority of the U.S. population has low intakes of key food groups that are important sources of the **shortfall nutrients including vegetables, fruits, whole grains, and dairy.** Furthermore, population intake is too high for refined grains and added sugars. The data suggest cautious optimism about dietary intake of the youngest members of the U.S. population because many young

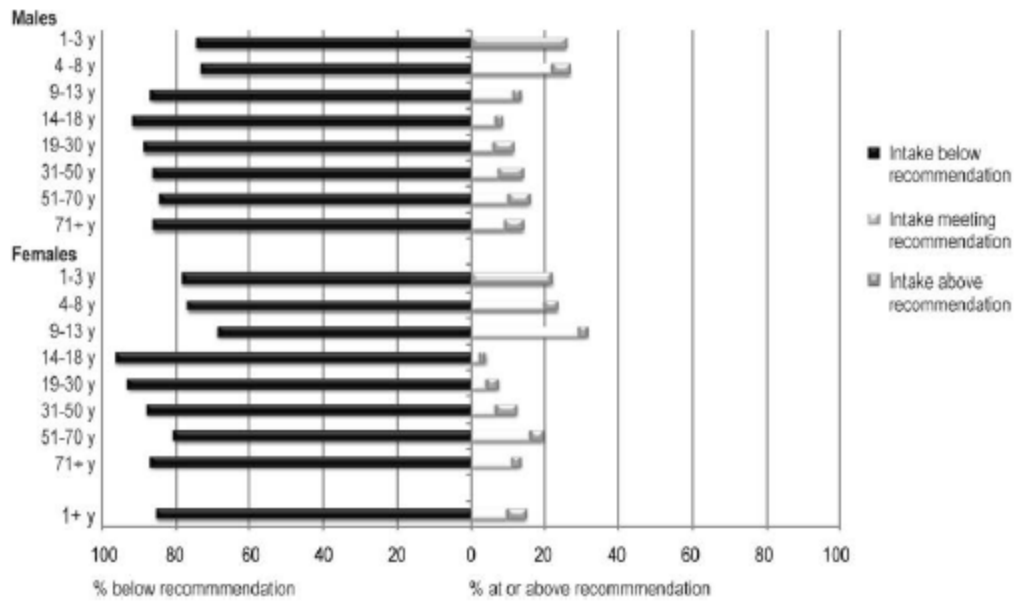
children ages 2 to 5 years consume recommended amounts of fruit and dairy. However, a better understanding is needed on how to maintain and encourage the good habits that are started early in life. Analysis of data on food categories, such as burgers, sandwiches, mixed dishes, desserts, and beverages, because they represent such a large proportion of the calories consumed, are prime targets for **reformulation** to increase population intake of **vegetables, whole grains, and other underconsumed food groups** and to **lower population intake of the nutrients sodium and saturated fat, and the food component refined grains**. **Dramatically reducing the intake of sugar-sweetened beverages and limiting sweets and desserts would help lower intakes the food component added sugars**. The U.S. population purchases its food in a variety of locations, including supermarkets, convenience stores, schools, and the workplace, and consumes prepared food outside the home. The DGAC found that while diet quality varies somewhat by the setting where food is obtained, overall, independent of where the food is prepared or obtained, **the diet quality of the U.S. population does not meet recommendations for fruit, vegetables, dairy, or whole grains, and exceeds recommendations, to overconsumption, for the nutrients sodium and saturated fat, and the food components refined grains, solid fats, and added sugars**.

Figure D1.11 Total Vegetables: Estimated percent of persons below, at, or above recommendation



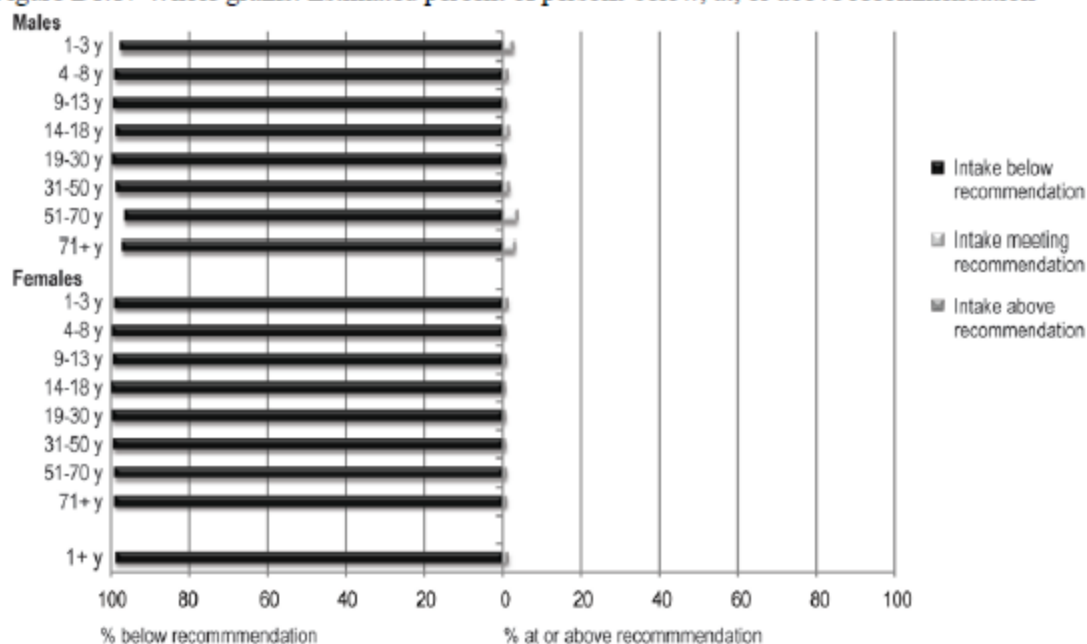
Source: What We Eat in America, NHANES 2007-2010

Figure D1.14 Beans and Peas: Estimated percent of persons below, at, or above recommendation



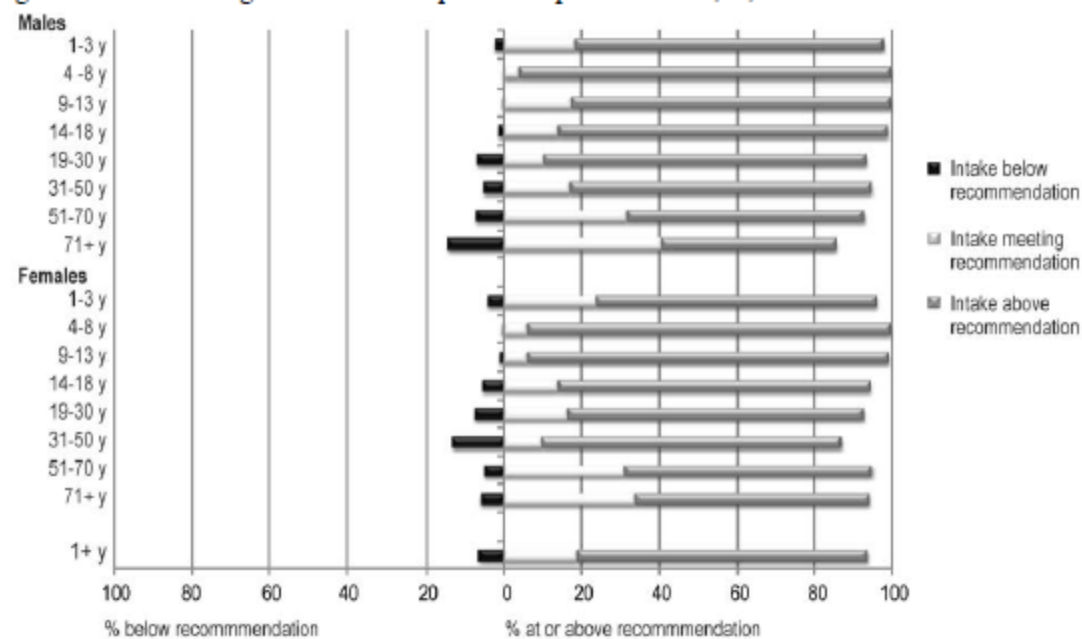
Source: What We Eat in America, NHANES 2007-2010

Figure D1.17 Whole grains: Estimated percent of persons below, at, or above recommendation



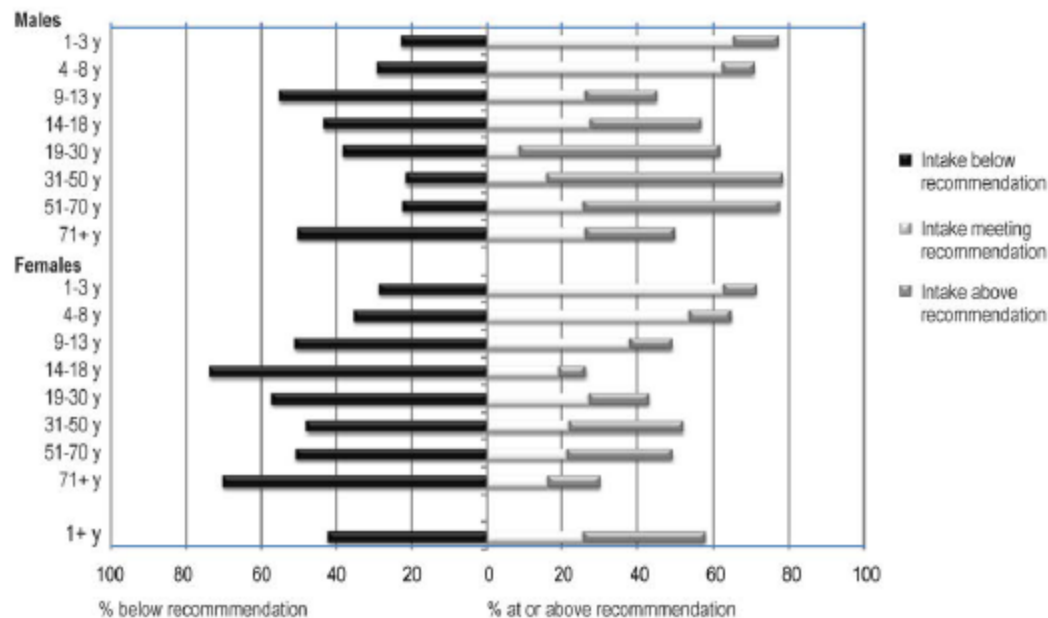
Source: What We Eat in America, NHANES 2007-2010

Figure D1.18 Refined grains: Estimated percent of persons below, at, or above limits



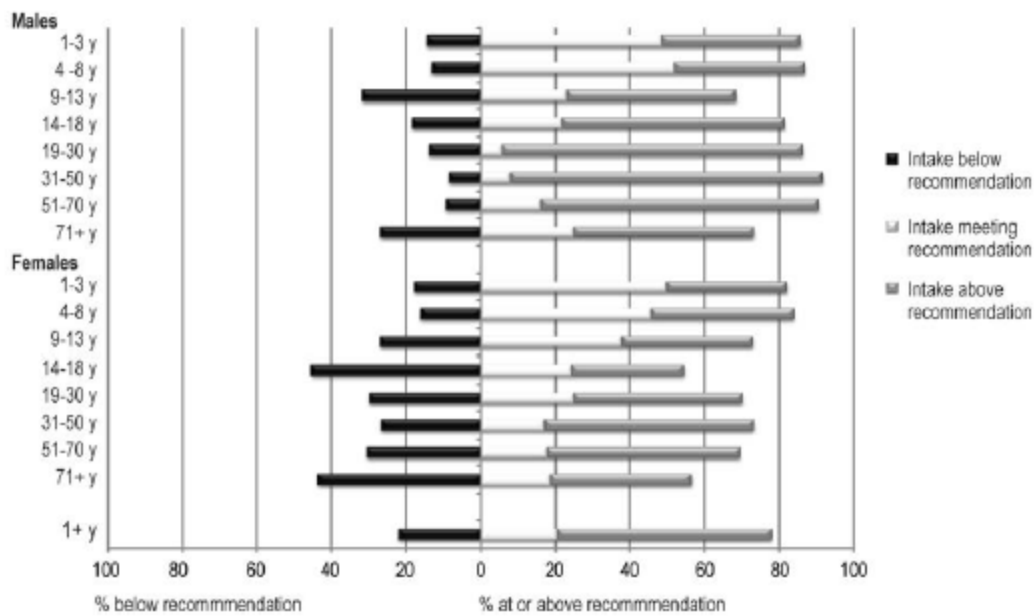
Source: What We Eat in America, NHANES 2007-2010

Figure D1.20 Total Protein foods: Estimated percent of persons below, at, or above recommendation



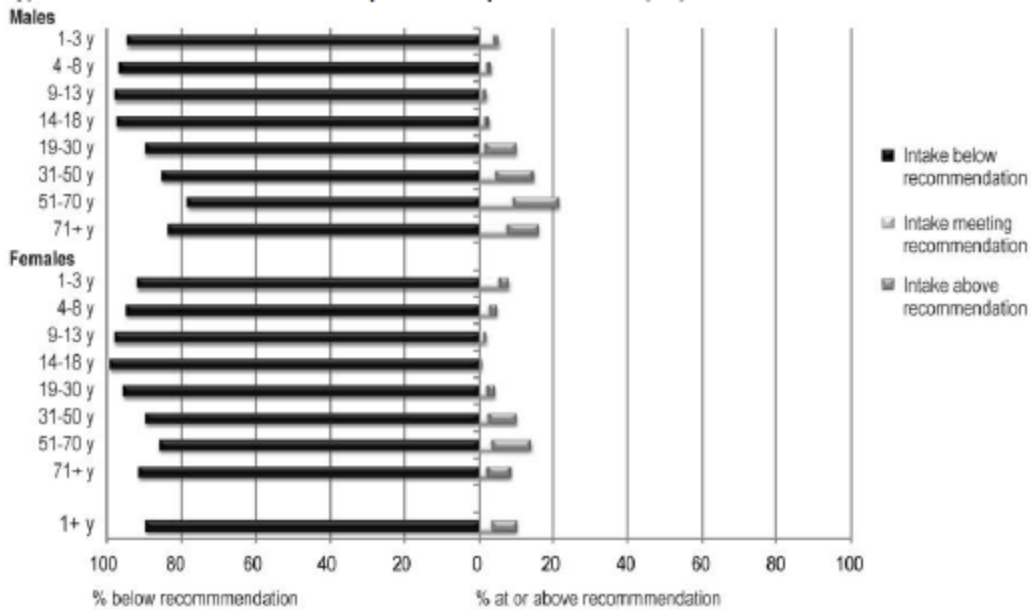
Source: What We Eat in America, NHANES 2007-2010

Figure D1.21 Meat, poultry, eggs: Estimated percent of persons below, at, or above recommendation



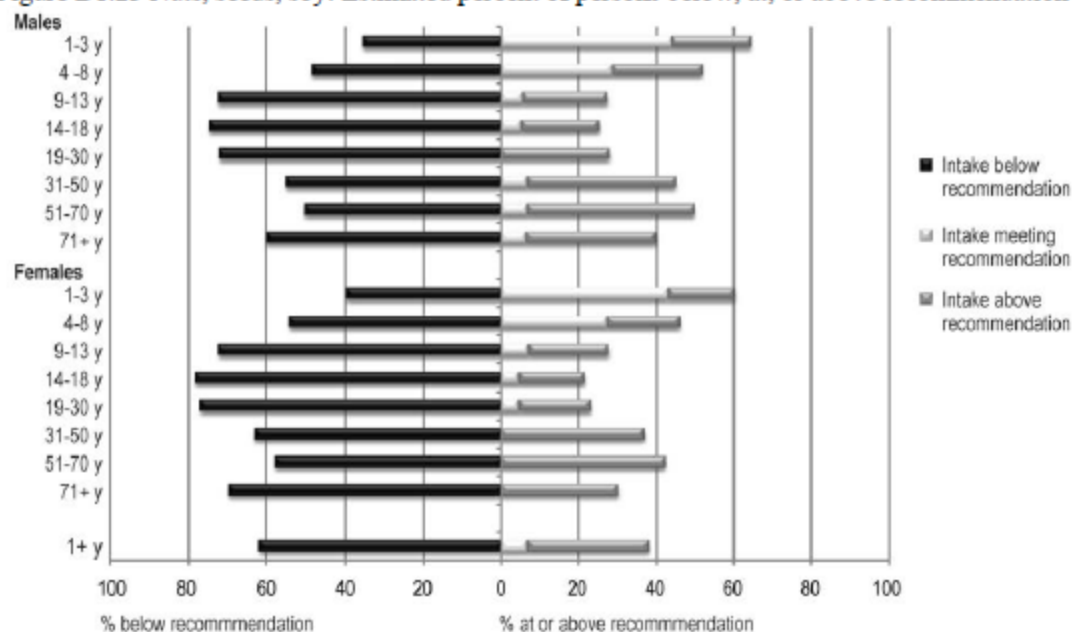
Source: What We Eat in America, NHANES 2007-2010

Figure D1.22 Seafood: Estimated percent of persons below, at, or above recommendation



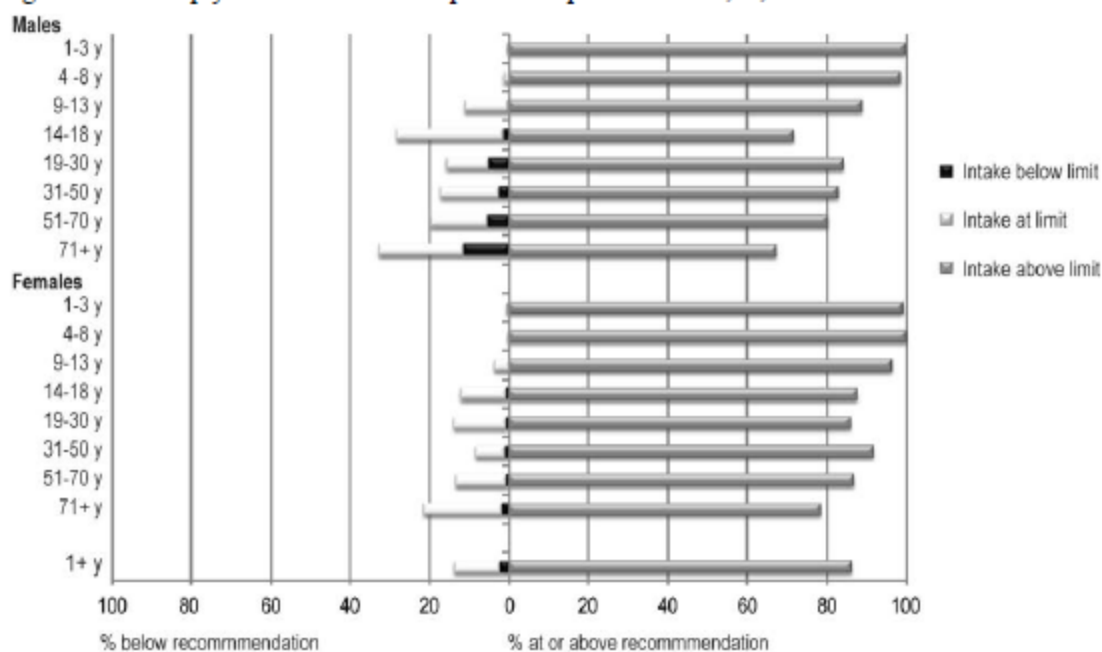
Source: What We Eat in America, NHANES 2007-2010

Figure D1.23 Nuts, seeds, soy: Estimated percent of persons below, at, or above recommendation



Source: What We Eat in America, NHANES 2007-2010

Figure D1.24 Empty calories: Estimated percent of persons below, at, or above limits



Source: What We Eat in America, NHANES 2007-2010

Obesity and chronic diseases with a nutritional origin are very common. The Nation must accelerate progress toward reducing the incidence and prevalence of overweight and obesity

and chronic disease risk across the U.S. population throughout the lifespan and reduce the disparities in obesity and chronic disease rates that exist in the United States for certain ethnic and racial groups and for those with lower incomes. The DGAC identified key aspects of several different dietary patterns that are associated with lower risk of many nutrition-related outcomes such as cardiovascular disease, diabetes, some cancers, psychological health and bone health. The DGAC had enough descriptive information from existing research and data to model three dietary patterns and to examine their nutritional adequacy. **These patterns are the Healthy U.S.-style Pattern, the Healthy Mediterranean-style Pattern, and the Healthy Vegetarian Pattern. (see tables below)** These patterns include the components of a dietary pattern associated with health benefits. The findings from this chapter and the remainder of the 2015 DGAC report can be used by individuals, families, communities, schools, local, state and federal agencies and the food industry to **address the high prevalence of obesity and other nutrition-related health conditions in the United States and help all sectors of the population consume a diet that is healthful, accessible, and affordable.**

Table D1.32. Composition of three USDA Food Patterns (Healthy U.S.-Style, Healthy Vegetarian, and Healthy Mediterranean-style) at the 2000 calorie level. Daily or weekly amounts from selected food groups, subgroups, and components.

Food group	Healthy US-style Pattern	Healthy Vegetarian Pattern	Healthy Med-style Pattern
Fruit	2 c per day	2 c per day	2 ½ c per day
Vegetables	2 ½ c per day	2 ½ c per day	2 ½ c per day
--Legumes	1 ½ c per wk	3 c per wk	1 ½ c per wk
Whole Grains	3 oz eq per day	3 oz eq per day	3 oz eq per day
Dairy	3 c per day	3 c per day	2 c per day
Protein Foods	5 ½ oz eq per day	3 ½ oz eq per day	6 ½ oz eq per day
--Meat	12 ½ oz eq/wk	--	12 ½ oz eq/wk
--Poultry	10 ½ oz eq/wk	--	10 ½ oz eq/wk
--Seafood	8 oz eq/wk	--	15 oz eq/wk
--Eggs	3 oz eq/wk	3 oz eq/wk	3 oz eq/wk
--Nuts/seeds	4 oz eq/wk	7 oz eq/wk	4 oz eq/wk
--Processed soy	½ oz eq/wk	8 oz eq/wk	½ oz eq/wk
Oils	27 g per day	27 g per day	27 g per day

Source: Food Pattern Modeling report: *Appendix E-3.7 Developing Vegetarian and Mediterranean-style Food Patterns*

Table D1.33. Nutrients in the three USDA Food Patterns (Healthy US Style, Healthy Vegetarian, and Healthy Mediterranean-style) at the 2000 calorie level as a percent of the goal or limit for a 19 to 30 year old woman.

Nutrient	Healthy US-style Pattern % goal/limit	Healthy Vegetarian Pattern % goal/limit	Healthy Med-style Pattern % goal/limit
Protein -%RDA	198	155	194
Protein -%calorie	18	14	18
Fat-%calorie	33	34	32
Saturated fat* - %calorie	8	8	8
CHO-%RDA	197	211	199
CHO-%calorie	51	55	52
Fiber -% goal	109	126	112
Calcium-%RDA	127	133	100
Iron-%RDA	93	96	95
Vitamin D-%RDA	46	37	42
Potassium-%AI	71	70	71
Sodium*-%UL	78	61	73

*overconsumed nutrient

Source: Food Pattern Modeling report: Developing Vegetarian and Mediterranean-style Food Patterns (see *Appendix E-3.7*)

The dietary patterns approach captures the relationship between the overall diet and its constituent foods, beverages, and nutrients in relationship to outcomes of interest. Numerous dietary patterns were identified...The Committee's examination of the association between dietary patterns and various health outcomes revealed remarkable consistency in the findings and implications that are noteworthy. When looking at the dietary pattern conclusion statements across the various health outcomes, certain characteristics of the diet were consistently identified (see Table D2.3 below).

Table D2.3. Description of the dietary patterns highlighted in the DGAC's Conclusion Statements that are associated with benefit related to the health outcome of interest. (Note: The reader is directed to the full Conclusion Statement above for more information on the relationship between dietary patterns and the health outcome. In some cases, dietary components were associated with increased health risk and this is noted in the table.)

Health Outcome	DGAC Grade ^a	Description of the Dietary Pattern Associated with Beneficial Health Outcomes
Cardiovascular disease	Strong	Dietary patterns characterized by higher consumption of <i>vegetables, fruits, whole grains, low-fat dairy, and seafood</i> , and lower consumption of <i>red and processed meat</i> , and lower intakes of <i>refined grains</i> , and <i>sugar-sweetened foods and beverages</i> relative to less healthy patterns; regular consumption of <i>nuts and legumes</i> ; moderate consumption of <i>alcohol</i> ; lower in <i>saturated fat, cholesterol, and sodium</i> and richer in <i>fiber, potassium, and unsaturated fats</i> .
Measures of body weight or obesity	Moderate	Dietary patterns that are higher in <i>vegetables, fruits, and whole grains</i> ; include <i>seafood and legumes</i> ; are moderate in <i>dairy products (particularly low and non-fat dairy)</i> and <i>alcohol</i> ; lower in <i>meats (including red and processed meats)</i> , and low in <i>sugar-sweetened foods and beverages</i> , and <i>refined grains</i> ; higher intakes of <i>unsaturated fats</i> and lower intakes of <i>saturated fats, cholesterol, and sodium</i> .
	Limited	Dietary patterns in childhood or adolescence that are higher in energy-dense and low-fiber foods, such as <i>sweets, refined grains, and processed meats</i> , as well as <i>sugar-sweetened beverages, whole milk, fried potatoes, certain fats and oils, and fast foods</i> are associated with an increased risk.
Type 2 diabetes	Moderate	Dietary patterns higher in <i>vegetables, fruits, and whole grains</i> and lower in <i>red and processed meats, high-fat dairy products, refined grains, and sweets/sugar-sweetened beverages</i> .
Cancer	Moderate	Colon/Rectal Cancer: Dietary patterns that are higher in <i>vegetables, fruits, legumes, whole grains, lean meats/seafood, and low-fat dairy</i> and moderate in <i>alcohol</i> ; and low in <i>red and/or processed meats, saturated fat, and sodas/sweets</i> . (Conversely, diets that are higher in <i>red/processed meats, French fries/potatoes, and sources of sugars (i.e., sodas, sweets, and dessert foods)</i> are associated with a greater risk.)
	Moderate (post) / Limited (pre)	Breast Cancer: Dietary patterns rich in <i>vegetables, fruit, and whole grains</i> , and lower in <i>animal products and refined carbohydrate</i> .
	Limited	Lung Cancer: Dietary patterns containing more frequent servings of <i>vegetables, fruits, seafood, grains/cereals, and legumes</i> , and <i>lean versus higher fat meats and lower fat or non-fat dairy products</i> .
	Not assignable	Prostate Cancer: N/A
Congenital anomalies	Limited – Neural tube defects	Neural tube defects: Dietary patterns during the preconception period that are higher in <i>vegetables, fruits, and grains</i> , and lower in <i>red and processed meats</i> , and low in <i>sweets</i> .
	Not assignable	Congenital heart defects or cleft lip/palate: N/A
Neurological and psychological illnesses	Limited	Age-related cognitive impairment, dementia, and/or Alzheimer's disease: Dietary patterns containing an array of <i>vegetables, fruits, nuts, legumes and seafood</i> .
	Limited	Depression: Dietary patterns emphasizing <i>seafood, vegetables, fruits, nuts, and legumes</i> .
Bone health	Limited	Adults: Dietary patterns higher in <i>vegetables, fruits, grains, nuts, and dairy products</i> , and lower in <i>meats and saturated fat</i> .
	Not assignable	Children: N/A

^a The DGAC Grade presented represents the grade the Committee provided for the conclusion statement with the dietary pattern components described. Some health outcomes had more than one graded conclusion. Only the conclusion statements that describe dietary pattern components are presented here. Post = Post-menopausal; Pre = Pre-menopausal

Common characteristics of dietary patterns associated with positive health outcomes include **higher intake of vegetables, fruits, whole grains, low- or non-fat dairy, seafood, legumes, and nuts; moderate intake of alcohol (among adults); lower consumption of red and processed meat, and low intake of sugar-sweetened foods and drinks, and refined grains. Vegetables and fruits are the only characteristics of the diet that were consistently identified in every conclusion statement across the health outcomes.** Whole grains were identified slightly less consistently compared to vegetables and fruits, but were identified in every conclusion with moderate to strong evidence. For studies with limited evidence, grains were not as consistently defined and/or they were not identified as a key characteristic. Low- or non-fat dairy, seafood, legumes, nuts, and alcohol were identified as beneficial characteristics of the diet for some, **but not all**, outcomes. For conclusions with moderate to strong evidence, higher intake of red and processed meats was identified as **detrimental** compared to lower intake. Higher consumption of sugar-sweetened foods and beverages as well as refined grains were identified as **detrimental** in almost all conclusion statements with moderate to strong evidence.

Part D. Chapter 3: Individual Diet and Physical Activity 2 Behavior Change

INTRODUCTION

Individual behavior change lies at the inner core of the social-ecological model that forms the basis of the 2015 Dietary Guidelines for American Advisory Committee (DGAC) conceptual model. For this reason, it is crucial to identify the behavioral strategies that individuals living in

the United States can follow to improve their healthy lifestyle behaviors as well as the key contextual factors that facilitate the ability of individuals to consume healthy diets. In the past, American families seldom consumed food prepared outside their homes and, for the most part, consumed their meals as a family unit. However, these behaviors have changed dramatically in recent years. Today, 33 percent of calories are consumed outside the home and it is becoming more common for individuals to eat alone and to bring meals prepared outside into their homes. Eating away from home is associated with increased caloric intake and poorer dietary quality compared to eating at home.

As recognized by the 2010 DGAC these major changes in eating behaviors can be expected to have a negative impact on the quality of the diets consumed and the risk of obesity among the U.S. population. Other individual lifestyle behaviors related to dietary intakes and obesity risk also have changed in recent decades. The U.S. population has become increasingly sedentary, with daily hours of screen time exposure becoming a serious public health concern due to its potential negative influence on dietary and weight outcomes. For example, it has been hypothesized that TV viewing time has a negative influence on dietary habits of individuals because of unhealthy snacking while watching TV and through exposure to advertisements of unhealthy food products. In turn, excess caloric intake coupled with sedentary time directly resulting from excessive TV may increase the risk of obesity. Suboptimal sleep patterns associated with today's busy lives also have been identified as a potential risk factor for poor dietary behaviors and body weight outcomes. In response to these trends, interest has grown in the potential of behavioral strategies that individuals can use to improve their dietary behaviors. Specifically, self-monitoring of diet, physical activity, and body weight has been identified as a potential key component of successful healthy lifestyle interventions. Diet self-monitoring may, in turn, be facilitated by the availability and use of menus displaying calorie labels and the Nutrition Facts label on packaged foods.

CHAPTER SUMMARY

The individual is at the innermost core of the social-ecological model. In order for policy recommendations such as the Dietary Guidelines for Americans to be fully implemented, motivating and facilitating behavioral change at the individual level is required. The collective work presented in this chapter suggests a number of promising behavior change strategies that can be used to favorably impact a range of health related outcomes and to enhance the effectiveness of interventions. These include reducing screen time, reducing the frequency of eating out at fast-food restaurants, increasing frequency of family shared meals, and self-monitoring of diet and body weight as well as effective food labeling to target healthier food choices.

In summary, this chapter calls for: a) continuous support of Federal programs to help alleviate the consequences of household food insecurity, b) food and nutrition assistance programs to take into account the risk that immigrants have of giving up their healthier dietary habits soon after arriving in the United States, and c) efforts to provide all individuals living in the United States with the environments, knowledge, and tools needed to implement effective individual- or

family-level behavioral change strategies to improve the quality of their diets and reduce sedentary behaviors.

Part D. Chapter 5: Food Sustainability and Safety

INTRODUCTION

In this chapter, the DGAC addresses food and nutrition issues that will inform public health action and policies to promote the health of the population through sustainable diets and food safety. An important reason for addressing sustainable diets, a new area for the DGAC, is to have alignment and consistency in dietary guidance that promotes both health and sustainability. This also recognizes the significant impact of food and beverages on environmental outcomes, from farm to plate to waste disposal, and, therefore, the need for dietary guidance to include the wider issue of sustainability. Addressing this complex challenge is essential to ensure a healthy food supply will be available for future generations. The availability and acceptability of healthy and sustainable food choices will be necessary to attain food security for the U.S. population over time. Integral to this issue is how dietary guidance and individual food choices influence the nation's capacity to meet the nutritional needs of the U.S. population. Food sustainability and food safety are also interrelated in generating a secure food supply. This chapter focuses on both sustainable diets and food safety.

Food Sustainability

Two definitions are relevant to the material presented in this chapter. These terms were slightly modified from the Food and Agriculture Organization (FAO) definitions to operationalize them for the Committee's work.

Sustainable diets: Sustainable diets are a pattern of eating that promotes health and well-being and provides food security for the present population while sustaining human and natural resources for future generations.

Food security: Food security exists when all people now, and in the future, have access to sufficient, safe, and nutritious food to maintain a healthy and active life.

The environmental impact of food production is considerable and if natural resources such as land, water and energy are not conserved and managed optimally, they will be strained and potentially lost. The global production of food is responsible for 80 percent of deforestation, more than 70 percent of fresh water use, and up to 30 percent of human-generated greenhouse gas (GHG) emissions. It also is the largest cause of species biodiversity loss. The capacity to produce adequate food in the future is constrained by land use, declining soil fertility, unsustainable water use, and over-fishing of the marine environment. Climate change, shifts in population dietary patterns and demand for food products, energy costs, and population growth will continue to put additional pressures on available natural resources. Meeting current and future food needs will depend on two concurrent approaches: altering individual and population

dietary choices and patterns and developing agricultural and production practices that reduce environmental impacts and conserve resources, while still meeting food and nutrition needs.

Foods vary widely in the type and amount of resources required for production, so as population- level consumer demand impacts food production (and imports) it will also indirectly influence how and to what extent resources are used. As the focus of the dietary guidelines is to shift consumer eating habits toward healthier alternatives, it is imperative that, in this context, the shift also involve movement toward less resource-intensive diets. Individual and population-level adoption of more sustainable diets can change consumer demand away from more resource intensive foods to foods that have a lower environmental impact.

In this chapter, the DGAC has used an evidence-based approach to evaluate the foods and food components that improve the sustainability of dietary patterns as a step toward this desirable goal. The approach used was to determine dietary patterns that are nutritionally adequate and promote health, while at the same time are more protective of natural resources. This type of comprehensive strategy also has been used by intergovernmental organizations. For example, the FAO (Food and Agricultural Organization of the United Nations) has identified the **Mediterranean diet** as an example of a sustainable diet due to its **emphasis on biodiversity and smaller meat portions** and the European Commission has developed a **“2020 Live Well Diet” to reduce GHG emissions through diet change**. It should be noted that research in the area of dietary patterns and sustainability is rapidly evolving and the methodologies for determining dietary patterns in populations and Life Cycle Analysis of foods/food components and environmental outcomes have made significant advances in recent years. This is exemplified by the size of evidence base for this question and the fact that several relevant articles have been published even since the close of the 2015 DGAC Nutrition Evidence Library (NEL) scientific review period for this topic.

Figure D5.1 outlines the interconnected elements that the DGAC believes are necessary based on current evidence to develop sustainable diets. Sustainable diets are realized by developing a food system that embraces a core set of values illustrated in the figure. These values need to be implemented through robust private and public sector partnerships, practices and policies across the supply chain, extending from farms to distribution and consumption. New well-coordinated policies that include, but are not limited to, agriculture, economics, transportation, energy, water use, and dietary guidance need to be developed. Behaviors of all participants in the food system

are central to creating and supporting sustainable diets.

Figure D5.1: Elements needed for sustainable diets



Although the addition of sustainability topics in the Scientific Report of the 2015 Dietary Guidelines Advisory Committee is new in 2015 it was acknowledged as a topic of strong relevance but not addressed by the 2010 DGAC. It has been a widely discussed aspect of nutrition policy for the past decade in countries such as Germany, Sweden and other Nordic countries, the Netherlands, Australia, and Brazil.

For example, in the Netherlands, the Advisory report, Guidelines for a Healthy Diet: The Ecological Perspective focused on guidelines that inform both health and ecological benefits using an evidence-based strategy. Nordic countries, such as Sweden, have been researching sustainability and dietary choice since the late 1990s with the most recent edition of the Nordic Nutrition Recommendations (NNR) including an emphasis on the environmental impact of dietary recommendations. The German Dietary Guidelines developed a “sustainable shopping basket,” which is a consumer guide for shopping in a more sustainable way. Overall, the environmentally sustainable dietary guidance from these countries includes elements identified in this DGAC report as consistent with the extant data: **a focus on decreasing meat consumption, choosing seafood from non-threatened stocks, eating more plants and plant-based products, reducing energy intake, and reducing waste.**

Non- governmental and international organizations, such as the United Nations, the FAO, the Sustainable Development Commission in the United Kingdom (UK), the Institute of Medicine (IOM), the Academy of Nutrition and Dietetics, and the National Research Council have all

convened working groups and commissioned reports on sustainable diets. Overall, it is clear that environmental sustainability adds further dimensions to dietary guidance; not just what we eat but where and how food production, processing, and transportation are managed, and waste is decreased.

CHAPTER SUMMARY

Access to sufficient, nutritious, and safe food is an essential element of food security for the U.S. population. A sustainable diet is one that assures this access for both the current population and future generations. This chapter focused on evaluating the evidence around sustainable diets and several topic areas of food safety. **The major findings regarding sustainable diets were that a diet higher in plant-based foods, such as vegetables, fruits, whole grains, legumes, nuts, and seeds, and lower in calories and animal-based foods is more health promoting and is associated with less environmental impact than is the current U.S. diet.** This pattern of eating can be achieved through a variety of dietary patterns, including the “Healthy U.S.-style Pattern,” the “Healthy Mediterranean-style Pattern,” and the “Healthy Vegetarian Pattern”.

All of these dietary patterns are aligned with lower predicted environmental impacts and provide food options that can be adopted by the U.S. population. Current evidence shows that the average U.S. diet has a potentially larger environmental impact in terms of increased GHG emissions, land use, water use, and energy use, compared to the above dietary patterns. This is because the current U.S. population intake of animal-based foods is higher and the plant-based foods are lower, than proposed in these three dietary patterns. Of note is that no food groups need to be eliminated completely to improve food sustainability outcomes.

A moderate amount of seafood is an important component of two of three of these dietary patterns, and has demonstrated health benefits. The seafood industry is in the midst of rapid expansion to meet worldwide demand, although capture fishery production has leveled off while aquaculture is expanding. The collapse of some fisheries due to overfishing in the past decades has raised concern about the ability to produce a safe and affordable supply. In addition, concern has been raised about the safety and nutrient content of farm-raised versus wild-caught seafood. To supply enough seafood to support meeting dietary recommendations, both farm-raised and wild caught seafood will be needed. The review of the evidence demonstrated, in the species evaluated, that farm-raised seafood has as much or more EPA and DHA per serving than wild caught. Low-trophic seafood, such as catfish and crawfish, regardless of whether wild caught or farm-raised seafood, have less than half the EPA and DHA per serving than high-trophic seafood, such as salmon and trout.

Regarding contaminants, for the majority of wild caught and farmed species, neither the risks of mercury nor organic pollutants outweigh the health benefits of seafood consumption. Consistent evidence demonstrated that wild caught fisheries that have been managed sustainably have remained stable over the past several decades; however, wild caught fisheries are fully exploited and their continuing productivity will require careful management nationally and

internationally to avoid long-term collapse. Expanded supply of seafood nationally and internationally will be dependent upon the increase of farm-raised seafood worldwide.

The impact of food production, processing, and consumption on environmental sustainability is an area of research that is rapidly evolving. As further research is conducted and best practices evaluated, additional evidence will inform both supply-side participants and consumers on how best to shift behaviors locally, nationally, and globally to support sustainable diets. **Linking health, dietary guidance and the environment will promote human health and the sustainability of natural resources and ensure current and long-term food security.**

In regards to food safety, updated and previously unexamined areas of food safety were studied. No previous DGACs have reported on coffee/caffeine consumption and health. **Currently, strong evidence shows that consumption of coffee within the moderate range (3 to 5 cups per day or up 1728 to 400 mg/d caffeine) is not associated with increased long-term health risks among healthy individuals. In fact, consistent evidence indicates that coffee consumption is associated with reduced risk of type 2 diabetes and cardiovascular disease in healthy adults.** Moreover, moderate evidence shows a protective association between coffee/caffeine intake and risk of Parkinson's disease. Therefore, moderate coffee consumption can be incorporated into a healthy dietary pattern, along with other healthful behaviors. To meet the growing demand of coffee, there is a need to consider sustainability issues of coffee production in economic and environmental terms.

However, it should be noted that coffee as it is normally consumed can contain added calories from cream, milk, and added sugars. Care should be taken to minimize the amount of calories from added sugars and high-fat dairy or dairy substitutes added to coffee.

The marketing and availability of high-caffeine beverages and products is on the rise. Unfortunately, only limited evidence is currently available to ascertain the safety of high caffeine intake (greater than 400 mg/day for adults and undetermined for children and adolescents), that may occur with rapid consumption of large-sized energy drinks. The limited data suggest adverse health outcomes, such as caffeine toxicity and cardiovascular events. Concern is heightened when caffeine is combined with alcoholic beverages. Limited or no consumption of high caffeine drinks, or other products with high amounts of caffeine, is advised for children and adolescents. Energy drinks with high levels of caffeine and alcoholic beverages should not be consumed together, either mixed together or consumed at the same sitting.

The DGAC also examined the food additive aspartame. At the level that the U.S. population consumes aspartame, it appears to be safe. However, some uncertainty continues about increased risk of hematopoietic cancers in men, indicating a need for more research. Individual behaviors along with sound government policies and responsible private sector practices are all needed to reduce foodborne illnesses.

Part D. Chapter 6: Cross-Cutting Topics of Public Health

INTRODUCTION

The Dietary Guidelines for Americans, 2010 included guidance on sodium, saturated fat, and added sugars, and the 2015 DGAC determined that a reexamination of the evidence on these topics was necessary to evaluate whether revisions to the guidance were warranted. These topics were considered to be of public health importance because each has been associated with negative health outcomes when over-consumed. As the Committee considered it essential to address these topics across two or more Subcommittees, Working Groups were formed with representatives from the relevant Subcommittees to ensure that the topics were thoroughly addressed in a coordinated way. Additionally, the Committee acknowledged that a potential unintended consequence of a recommendation on added sugars might be that consumers and manufacturers replace added sugars with low-calorie sweeteners. As a result, the Committee also examined evidence on low-calorie sweeteners to inform statements on this topic. The updated findings in this chapter will help inform recommendations on these topics for the 2015 Dietary Guidelines for Americans. (see D6.2 below)

Table D6.2. Recommendations or statements related to added sugars or sugar-sweetened beverages from international and national organizations

Organization	Recommendation/Statement Related to Added Sugars and/or Sugar-Sweetened Beverages
World Health Organization (WHO) ⁶⁴	<ul style="list-style-type: none"> • WHO recommends reduced intake of free sugars throughout the life-course (<i>strong recommendation</i>). • In both adults and children, WHO recommends that intake of free sugars not to exceed 10% of total energy (<i>strong recommendation</i>). • WHO suggests further reduction to below 5% of total energy (<i>conditional recommendation</i>).
American Heart Association (AHA) ⁶⁵	The AHA recommends reductions in added sugars with an upper limit of half of the discretionary calorie allowance that can be accommodated within the appropriate energy intake level needed for a person to achieve or maintain a healthy weight based on the USDA food intake patterns. Most American women should eat or drink no more than 100 calories per day from added sugars (about 6 teaspoons), and most American men should eat or drink no more than 150 calories per day from added sugars (about 9 teaspoons).
HealthyPeople 2020 ⁶⁶	Objective NWS-17.2: Reduce consumption of calories from added sugars (Target: 10.8%)
American Academy of Pediatrics (AAP) ⁶⁷⁻⁶⁹	<p>Limit consumption of sugar-sweetened beverages (consistent evidence)</p> <p>Pediatricians should work to eliminate sweetened drinks in schools</p> <p><i>Note: Due to limited studies in children, the American Academy of Pediatrics (AAP) has no official recommendations regarding the use of non-caloric sweeteners.</i></p>
American Diabetes Association (ADA) ^{70, 71}	<p><u>Prevention</u></p> <p>Research has shown that drinking sugary drinks is linked to type 2 diabetes, and the American Diabetes Association recommends that people limit their intake of sugar-sweetened beverages to help prevent diabetes.</p> <p><u>Diabetes Management</u></p> <p>People with diabetes should limit or avoid intake of sugar-sweetened beverages (from any caloric sweetener including high fructose corn syrup and sucrose) to reduce risk for weight gain and worsening of cardiometabolic risk profile. (Evidence rating B)</p>
NHLBI Expert Panel Guidelines for Cardiovascular Health and Risk Reduction in Childhood ⁷²	Reduced intake of sugar-sweetened beverages is associated with decreased obesity measures (Grade B).

CHAPTER SUMMARY

The DGAC encourages the consumption of healthy dietary patterns that are low in saturated fat, added sugars, and sodium.

The goals for the general population are: less than 2,300 mg dietary sodium per day (or age-appropriate Dietary Reference Intake amount), less than 10 percent of total calories from saturated fat per day, and a maximum of 10 percent of total calories from added sugars per day.

Sodium, saturated fat, and added sugars are not intended to be reduced in isolation, but as a part of a healthy dietary pattern. **Rather than focusing purely on reduction, emphasis should be placed on replacement and shifts in food intake and eating patterns.** Sources of saturated fat should be replaced with unsaturated fat, particularly polyunsaturated fatty acids. Similarly, added sugars should be reduced in the diet and not replaced with low-calorie sweeteners, but rather with healthy options, such as water in place of sugar-sweetened

beverages. For sodium, emphasis should be placed on expanding industry efforts to reduce the sodium content of foods and helping consumers understand how to flavor unsalted foods with spices and herbs.

Achieving reductions in sodium, saturated fat, and added sugars, can all be accomplished and are more attainable by eating a healthy dietary pattern. For all three of these components of the diet, policies and programs at local, state, and national levels in both the private and public sector are necessary to support reduction efforts. Similarly, the Committee supports efforts in labeling and other campaigns to increase consumer awareness and understanding of sodium, saturated fats, and added sugars in foods and beverages. The Committee encourages the food industry to continue reformulating and making changes to certain foods to improve their nutrition profile. Examples of such actions include lowering sodium and added sugars content, achieving better saturated fat to polyunsaturated fat ratio, and reducing portion sizes in retail settings (restaurants, food outlets, and public venues, such as professional sports stadiums and arenas). The Committee also encourages the food industry to market these improved products to consumers.

Part D. Chapter 7: Physical Activity

INTRODUCTION

The combination of a healthy diet and regular physical activity is central to promoting overall health and preventing many chronic diseases. The Dietary Guidelines for Americans first⁵ emphasized the importance of physical activity in 1990 and has included the topic in every edition in the two decades since. Although the 1990 and 1995 Dietary Guidelines for Americans⁷ discussed physical activity as a tool for managing and maintaining a healthy body weight, it broadened this perspective with the 2000 edition. Beginning in 2000, the Dietary Guidelines for Americans' physical activity content reflected the growing evidence base on the relationship between physical activity and various health outcomes. This evidence, from a wide range of well-conducted studies, clearly demonstrates that physically active people have improved growth and development, higher levels of fitness, a lower risk profile for developing a number of disabling medical conditions, and lower rates of various chronic diseases than do people who are less active or sedentary.

In 2008, the U.S. Department of Health and Human Services issued the first Physical Activity Guidelines for Americans (PAG). The PAG serves as the benchmark and single, authoritative voice for science-based guidance on physical activity, fitness, and health for Americans 6 years and older (Table D7.1 below). The content of the PAG complements the Dietary Guidelines for Americans. Recognizing the dual importance of being physically active and eating a healthy diet to promote good health and reduce the risk of chronic diseases, therefore, the 2015 DGAC

included a number of physical activity questions, including several related to body weight.

Table D7.1. 2008 Physical Activity Guidelines for Americans: Key Recommendations
Recommendations for Children and Adolescents Ages 6 to 17 Years Children and adolescents should do 60 minutes (1 hour) or more of physical activity daily. <ul style="list-style-type: none">• Aerobic: Most of the 60 or more minutes a day should be either moderate- or vigorous-intensity aerobic physical activity, and should include vigorous-intensity physical activity at least 3 days a week.• Muscle-strengthening: As part of their 60 or more minutes of daily physical activity, children and adolescents should include muscle-strengthening physical activity on at least 3 days of the week.• Bone-strengthening: As part of their 60 or more minutes of daily physical activity, children and adolescents should include bone-strengthening physical activity on at least 3 days of the week.• It is important to encourage young people to participate in physical activities that are appropriate for their age, that are enjoyable, and that offer variety.
Recommendations for Adults Ages 18 Years and Older <ul style="list-style-type: none">• All adults should avoid inactivity. Some physical activity is better than none, and adults who participate in any amount of physical activity gain some health benefits.• For substantial health benefits, adults should do at least 150 minutes (2 hours and 30 minutes) a week of moderate-intensity, or 75 minutes (1 hour and 15 minutes) a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous intensity aerobic activity. Aerobic activity should be performed in episodes of at least 10 minutes, and preferably, it should be spread throughout the week.• For additional and more extensive health benefits, adults should increase their aerobic physical activity to 300 minutes (5 hours) a week of moderate intensity, or 150 minutes a week of vigorous intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity activity. Additional health benefits are gained by engaging in physical activity beyond this amount.• Adults should also do muscle-strengthening activities that are moderate or high intensity and involve all major muscle groups on 2 or more days a week, as these activities provide additional health benefits.
Recommendations for Older Adults The PAG recommendations for adults also apply to older adults. In addition, the following Guidelines are just for older adults (ages 65 years and older): <ul style="list-style-type: none">• When older adults cannot do 150 minutes of moderate-intensity aerobic activity a week because of chronic conditions, they should be as physically active as their abilities and conditions allow.• Older adults should do exercises that maintain or improve balance if they are at risk of falling.• Older adults should determine their level of effort for physical activity relative to their level of fitness.• Older adults with chronic conditions should understand whether and how their conditions affect their ability to do regular physical activity safely.

Despite the consistent public health advice and encouragement to engage in regular physical activity, the majority of the U.S. population does not meet PAG recommendations. Using self-reported measures, in 2012 fewer than 21 percent of adults met the PAG recommendations for aerobic and muscle-strengthening physical activity, with fewer women than men meeting recommendations. As reported in the National Health Interview Survey, physical activity participation rates are lower in Blacks or African Americans and Hispanic or Latinos than in White populations. Older adults had the lowest participation rates across all adult age groups. In 2013, only 27 percent of adolescents met PAG recommendations; again, fewer girls than boys achieved recommended levels of physical activity

It is important to note that self-reported data on physical activity participation rates are likely to have significant over-reporting bias. Using objective accelerometer data on a nationally representative sample, Troiano et al. demonstrated that the percentage of the population meeting PAG recommendations was much lower than with self-report. **For example, when considering bouts of moderate- to vigorous-intensity aerobic physical activity lasting 8 to 10 minutes or longer, less than 5 percent of adults met 2008 PAG recommendations.** Nonetheless, some data indicate that Americans may be increasing their level of physical activity. Over the past six years, consistent data show a minimal, but positive, trend.

To ensure sufficient discussion of physical activity for the population across the life cycle, as well as its relationship with a range of health outcomes, the DGAC reviewed the three major Federal reports on physical activity and health outcomes and selected specific questions for inclusion in this chapter. The Committee did not conduct independent formal systematic reviews of the evidence. This chapter summarizes the key evidence contained in these reports of the benefits of physical activity on health.

CHAPTER SUMMARY

The findings outlined in this chapter provide strong evidence supporting the importance of regular physical activity for health promotion and disease prevention in the U.S. population. Physical activity is important for all people—children, adolescents, adults, older adults, women during pregnancy and the postpartum period, and individuals with disabilities. The findings further provide guidance on the dose of physical activity needed across the lifecycle to realize these significant health benefits.

Future Physical Activity Guidelines Advisory Committees will be asked to carefully review the most recent evidence so that the Federal government can fully update the PAG. Given the exceedingly low physical activity participation rates in this country, it will be critically important for the next PAGAC to identify proven strategies and approaches to increase population-level physical activity across the lifespan.