Part B. Chapter 1: Introduction

The *Dietary Guidelines for Americans* were first released in 1980, and since that time they have provided science-based advice on promoting health and reducing risk of major chronic diseases through a healthy* diet and regular physical activity. Early editions of the Dietary Guidelines focused specifically on healthy members of the public, but more recent editions also have included those who are at increased risk of chronic disease. Future editions will continue to evolve to address public health concerns and the nutrition needs of specific populations. For example, the Dietary Guidelines have traditionally targeted the general public older than age 2 years, but as data continue to accumulate regarding the importance of dietary intake during gestation and from birth on, a Federal initiative has been established to develop comprehensive guidance for infants and toddlers from birth to 24 months and women who are pregnant. By 2020, the *Dietary Guidelines for Americans* will include these important populations comprehensively.

By law (Public Law 101-445, Title III, 7 U.S.C. 5301 et seq.) the *Dietary Guidelines for Americans* is published by the Federal government every 5 years. To meet this requirement, since the 1985 edition, the Departments have jointly appointed a Dietary Guidelines Advisory Committee of nationally recognized experts in the field of nutrition and health to review the scientific and medical knowledge current at the time. The 2015 Dietary Guidelines Advisory Committee (DGAC) was established for the single, time-limited task of reviewing the 2010 edition of *Dietary Guidelines for Americans* and developing nutrition and related health recommendations to the Federal government for its subsequent development of the 2015 edition. This report presents these recommendations to the Secretaries of Health and Human Services and of Agriculture for use in updating the Guidelines.

The 2015 DGAC recognizes the importance and key function of the Guidelines in forming the basis of Federal nutrition policy and programs. The Guidelines also provides a critical framework for local, state, and national health promotion and disease prevention initiatives. In addition, it provides evidence-based nutrition and physical activity strategies for use by individuals and those who serve them in public and private settings, including public health and social service agencies, health care and educational institutions, and business. The food industry and retailers as well, can use the Guidelines to develop healthy food and beverage products and offerings for consumers.

* Throughout this report, the term "healthy" is used to represent the concept of "health-promoting" as well as to refer to foods or dietary patterns that are consistent with the Dietary Guidelines. See the Glossary for a definition of "health."

The potential for the Guidelines to inform policy and practice is critical, given the significant nutrition-related health issues facing the U.S. population:

- **Overweight, obesity, and other diet-related chronic diseases** (particularly cardiovascular diseases, type 2 diabetes, and certain cancers), as well as less common but important health outcomes, such as bone health, for which nutrition plays an important role. These conditions are prevalent across the entire U.S. population, but are more pronounced in low-income populations, creating critical health disparities that must be addressed.

- **Less than optimal dietary patterns in the United States**, which contribute directly to poor population health and high chronic disease risk. On average, current dietary patterns are too low in vegetables, fruit, whole grains, and low-fat dairy, and too high in refined grains, saturated fat, added sugars, and sodium.

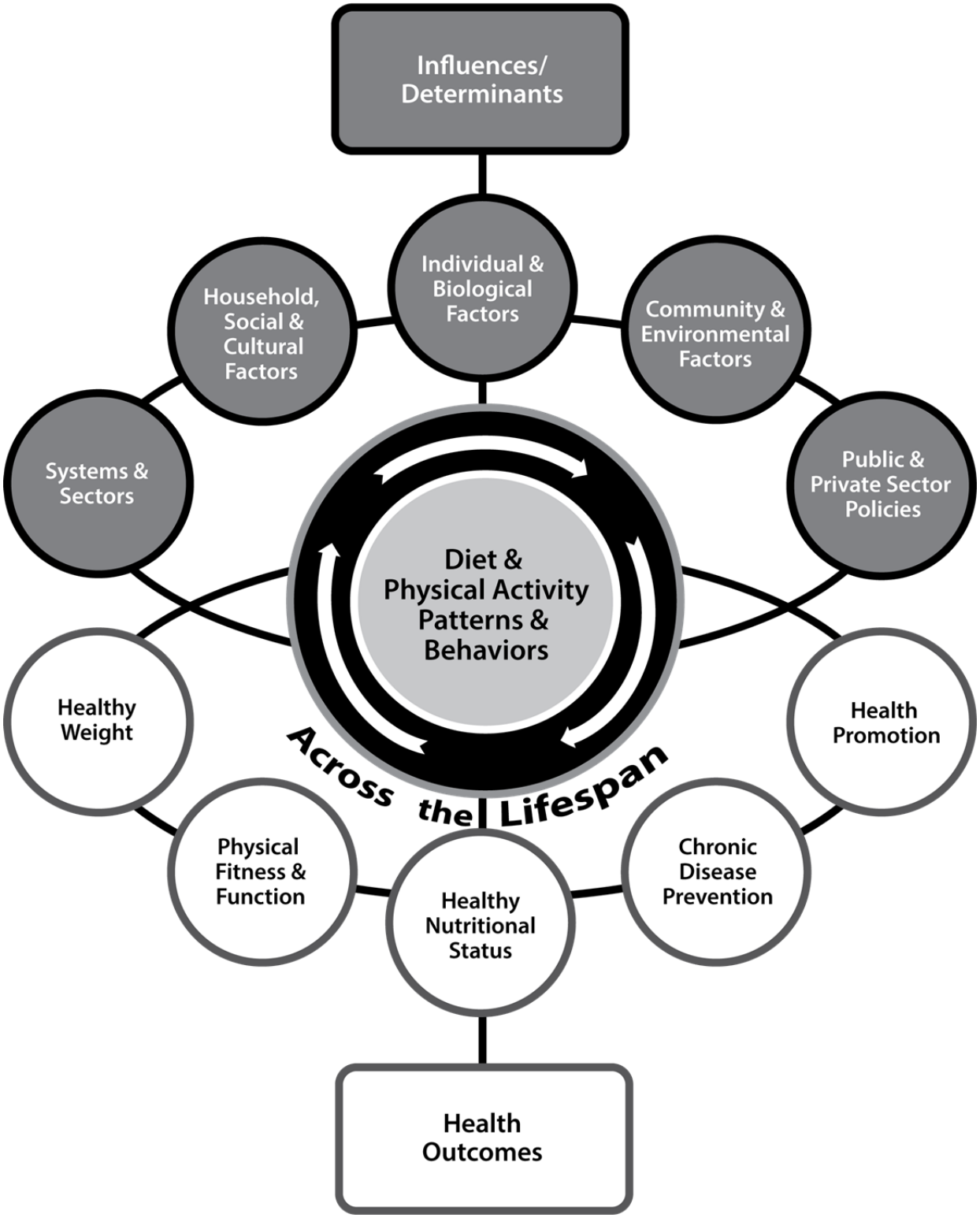
- **Food insecurity**, a condition in which the availability of nutritionally adequate foods, or the ability to acquire acceptable foods in socially acceptable ways, is limited or uncertain. More than 49 million people in the United States, including nearly 9 million children, live in food insecure households.

The economic and social costs of obesity and other diet- and physical activity-related chronic disease conditions are enormous and will continue to escalate if current trends are not reversed. Therefore, improving diet and physical activity in the population and addressing food insecurity and health disparities have great potential to not only reduce the burden of chronic disease morbidity and mortality, but also to reduce health care costs.

The DGAC recognized that a dynamic interplay exists among individuals' nutrition, physical activity, and other health-related lifestyle behaviors and their environmental and social contexts. Acknowledging this, the DGAC created a conceptual model based in part on the socio-ecological model to serve as an organizing framework for its report (Figure B2.1). The figure shows how these personal, social, organizational, and environmental contexts and systems interact powerfully to influence individuals' diet and physical activity behaviors and patterns and how diverse health outcomes result from this dynamic interplay. An accompanying table expands on the figure by listing specific factors that comprise each of the "Determinants" and "Outcomes" circles. The table distinguishes those factors that are addressed in the DGAC report from related factors that are important but beyond the scope of the report (see Table B2.1 at the end of this chapter).

Figure B2.1

Diet and Physical Activity, Health Promotion and Disease Prevention at Individual and Population Levels across the Lifespan



REVIEWING THE EVIDENCE

Drawing from this conceptual model, the 2015 DGAC reviewed an extensive and diverse body of scientific literature to address many research questions. For each of its questions, the Committee used a rigorous, evidence-based process to develop its findings. Some of the resulting evidence was strong to moderate, and some was found to be evolving and more limited. This graded evidence was used to draw scientific conclusion and implication statements and to make recommendations that can be used by HHS and USDA in formulating the *Dietary Guidelines for Americans* policy document.

The DGAC used the findings from its evidence reviews to develop a series of chapters that build on and complement each other:

- **Chapter 1** examines current status and trends in food consumption, nutrient intakes, and eating behaviors and rates and patterns of major nutrition-related health problems. It identifies the nutrients of public health concern and characterizes several dietary patterns that are consistent with those associated with positive health outcomes.
- **Chapter 2** considers relationships between dietary patterns and health outcomes and identifies a number of commonalities across patterns, particularly food groups, associated with positive health outcomes. It examines these relationships for major chronic diseases (cardiovascular diseases, type 2 diabetes, overweight and obesity, and certain cancers), and also evaluates several less common, but important, outcomes (bone health, neurological and psychological illnesses, congenital anomalies). Where possible, evidence on the impact of dietary or comprehensive lifestyle interventions (including diet, physical activity, and behavioral strategies) in reducing chronic disease risk outcomes is summarized and can be used to inform health promotion and disease prevention strategies at individual and population levels.
- **Chapter 3** reviews characteristics associated with individual dietary and lifestyle behaviors, such as meal patterns at home and away from home, acculturation, household food insecurity, and sedentary behaviors. It also assesses methods that are effective in helping individuals improve their diet and physical activity behaviors and in enhancing behavioral interventions.
- **Chapter 4** assesses the roles of food environments and settings in promoting or hindering healthy eating behaviors of specific population groups (such as pre-school and school-age children and adults in the workplace) and evaluates evidence on effective methods and best practices to promote population behavior change in communities as well as public and private settings to influence and improve health.
- **Chapter 5** focuses on secure and sustainable diets by examining how dietary guidance and food intake influence our capacity to meet the nutrition needs of the U.S. population now and

in the future. The chapter also examines issues related to food safety behaviors in the home environment and evaluates new topics of food safety concern, including the safety of coffee/caffeine and aspartame.

- **Chapter 6** considers topics of continuing public health importance that are relevant for topics across Chapters 1 through 5 and, are therefore addressed together in this chapter—sodium, saturated fat, added sugars, and low-calorie sweeteners.
- **Chapter 7** discusses the important role that physical activity plays in promoting health.

FROM THE 2015 DGAC ADVISORY REPORT TO THE *DIETARY GUIDELINES FOR AMERICANS*

A major goal of the 2015 DGAC is to summarize and synthesize the evidence to support USDA and HHS in developing nutrition recommendations that reduce the risk of chronic disease while meeting nutrient requirements and promoting health of the U.S. population ages 2 years and older.

The U.S. Government uses the Dietary Guidelines as the basis of its food assistance programs, nutrition education efforts, and decisions about national health objectives. For example, the National School Lunch Program and the Elder Nutrition Program incorporate the Dietary Guidelines in menu planning; the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) applies the Dietary Guidelines in its educational materials; and the *Healthy People 2020* objectives for the Nation include objectives based on the Dietary Guidelines.

The evidence described here in the 2015 DGAC Report, which will be used to develop the 2015 *Dietary Guidelines for Americans*, will help policymakers, educators, clinicians, and others speak with one voice on nutrition and health and reduce the confusion caused by mixed messages in the media. The DGAC hopes that the 2015 *Dietary Guidelines for Americans* will encourage the food industry and retailers to grow, manufacture, and sell foods that promote health and contribute to appropriate energy balance.

In reviewing the evidence on effective interventions and best practices at individual and population levels, the 2015 DGAC hopes that the *2015 Dietary Guidelines for Americans* will also lead to the bold actions needed to transform our health care and public health systems, communities, and businesses. A concerted and collaborative focus on prevention is needed and the report provides a foundation of research evidence to help create a national "culture of health" where healthy lifestyles are easier to achieve and normative. Finally, the 2015 DGAC desires that its evidence on healthy dietary patterns, which have been found to be important in reducing disease risk and in promoting food security and sustainability in the near- and long-term, will

lead to changes in individual eating behaviors and to systems-wide changes that can help to secure a healthy future for the U.S. population.

A GUIDE TO THE 2015 DGAC REPORT

This Report contains several major sections. Part A provides an Executive Summary to the Report. Part B sets the stage for the Report through this Introduction. A second chapter in this section provides an integration of major findings as well as specific recommendations for how the Report's evidence-based dietary recommendations can be put into action at the individual, community, and population levels.

Part C describes the methodology the DGAC used to conduct its work and review the evidence on diet and health. Part D is the Science Base and contains the chapters described above.

The Report concludes with a number of Appendices, including a compilation of the Committee's research recommendations; several appendices describing sources of evidence the Committee used in its reviews; a glossary; a brief history of the *Dietary Guidelines for Americans*; a summary of the process used to collect public comments; biographical sketches of DGAC members; a list of DGAC Working Group, Subcommittee, and Working/Writing Group members; and Acknowledgments.

Table B2.1: Components of the Conceptual Model

Influences/Determinants

	Factors	Addressed in the DGAC report	Other factors <u>not</u> addressed in the DGAC report
	**Individual & Biological Factors** (Represented in the model by characteristics of individuals and their physical makeup that influence lifestyle behaviors)		
	Biological factors	physical and cognitive function; clinical health and nutritional status profile; weight status	appetite, taste and smell acuity; hunger; physical, mental, and emotional well-being; digestion and metabolism; microbiome composition; genetic profile; prescribed medication use; drug-nutrient interactions
	Nutrition, physical activity, and health-related factors	food label use; dietary or physical activity self-monitoring; personal lifestyle profile characteristics including diet, physical activity, and lifestyle behaviors and practices	early diet experiences; perception of food safety and food security; access to nutrition and preventative health counseling; experiences with personal lifestyle behavior change
	Psychological factors	mental health	self/body image; food, nutrition, and health attitudes, beliefs, and preferences; motivation and intentions; self-efficacy; coping skills; mood; stress
	Demographics	age, gender, race/ethnicity, acculturation, income, geography/region, urban/rural location of residence	education, household composition and culture, religion, profession/occupation

	**Household, Social & Cultural Factors** (Represented in the model by structure, resources, values and norms that influence lifestyle behaviors)		
	Family/household/home	parenting and lifestyle behavioral modeling; food and beverage availability; cooking and storage facilities; family and shared meals; physical activity resources	living situation, composition, person(s) responsible for food purchases/preparation; home food environment
	Social/cultural/religious/ peer networks	engagement and participation in lifestyle and health-related programs and initiatives	beliefs, norms, values, expectations, and information sharing
	Society and culture		values and investments that support healthy communities and reduce health disparities; stewardship of natural resources and healthy environments
	**Community & Environmental Factors** (Represented in the model by physical and structural characteristics and facilities that provide access to and affect the quality of resources that influence lifestyle behaviors)		
	Food and physical activity	types of available retail food outlets, restaurants, food banks, and farmers' markets; safety, quality and sustainability of available food supplies; patterns of food waste	recreational facilities and resources
	Community	neighborhood food access; child care, schools, and worksites	composition, structure and conditions; social capital and networks; trust and power; disparities and inequities in food security, health, healthcare access, after school programs
	Business/Workplace	corporate/worksite wellness policies and programs, nutrition, exercise and health	employee benefits programs

		services, programs and resources	
	Health care and public health	providers and programs that emphasize lifestyle behavior change, health promotion and disease prevention; accessibility of clinical preventive services including nutrition counseling	health insurance benefits and access including preventative lifestyle services; food and nutrition assistance policies and programming; public and private healthcare networks and infrastructure
	Physical/built/natural environment		green spaces, parks, and recreational resources: availability and access; land use and transportation; abandoned buildings/spaces; soil contamination; chemical, fertilizer, antibiotic and pesticide use
	Ecosystems (national to global)	the natural environment, including farmland; plant, animal, marine, land, and water ecosystems; renewable energy resources; land/water/air and soil environments and quality; plant conservation, biodiversity; greenhouse gas emissions, pollution/contamination	plant and natural resources management and conservation; carbon footprint; global climate change
	**Systems & Sectors** (Represented in the model by spheres of influence on food availability and diet and physical activity behavior)		
	Consumer		acquisition, consumption, and demand; use, experience and satisfaction
	Retail and service		products, programs, markets; organization and management
	Food, beverage, and agriculture	usual and high levels of caffeine intake; aspartame	farming; import/export; production, processing, storage, distribution, delivery; supply/markets; food and beverage quality

			and safety; food technology and product formulation; advertising; food marketing
	Economy	income	employment; inflation and recession; social, political and human capital; productivity; prices of food
	Other	technology: mobile health (mHealth)	research and technology; emerging trends; entertainment; advertising and marketing; leisure and recreation; media and social media; globalization of trade
	**Public & Private Sector Policies** (Represented in the model by policies, regulations and laws that influence the availability and quality of products, resources, programs and services that influence diet and physical activity behaviors)		
	Government	federal, state and local food and nutrition assistance programs and/or initiatives that promoting physical activity/movement (e.g. NSLP, SBP, elder nutrition); city and town policies (e.g. taxation, bans, food assistance, price incentives); food and beverage labels	policies, laws and regulations that affect agriculture, food safety and food assistance; educational institutions; employers and worksites; healthcare systems and health insurance
	Business/Workplace	workplace policies on nutrition and physical activity programs, services and resources	employee health benefits (including health insurance) and incentives
	Education and social services across the lifespan	policies, laws and regulations that affect food and beverage availability including competitive foods; nutrition and physical activity programs and services (e.g. in childcare, school, elder care and community settings); food, nutrition, and physical activity services in federal, state	

		and local food assistance settings	

The central portion of the Conceptual Model represents the concept that the combination of a healthy diet and regular physical activity behaviors and patterns is central to promoting overall health and preventing many chronic diseases.

Health Outcomes

	Factors	Addressed in the DGAC report	Other factors <u>not</u> addressed in the DGAC report
	**Healthy Weight** (Represented in the model by measures that characterize a health-promoting weight status)		
	Weight and body composition	childhood and adolescence length/height, weight and Z scores, body weight and weight gain, BMI, waist circumference, abdominal obesity, lean and body fat mass; overweight and obesity	
	**Physical Fitness & Function** (Represented in the model by activities that define a health-promoting level of physical fitness and function)		
	Physical activity and function patterns and behaviors	Aerobic and strengthening activities; occupational, work, and leisure time activity	ability to perform activities of daily living; muscle strength; coordination; falls; physical activity knowledge, awareness and skills
	Sedentary behaviors and sleep patterns	screen time and other sedentary behaviors	sleep patterns (sleep duration, characteristics)

Healthy Nutritional Status

(Represented in the model by the knowledge, behaviors, environmental factors and measures that characterize healthy nutritional status)

Dietary patterns	habitual food and nutrient consumption; overall dietary quality and variety	
Food, beverage and nutrition intake	foods/food groups, beverages (including alcohol), and macro and micronutrients, nutrients of concern and public health significance	
Dietary product and nutrient supplement use	dietary product and nutrient supplement use	nutraceutical use
Food and nutrition knowledge, attitudes and skills	food preparation, cooking and nutrition knowledge, attitudes and skills	
Food security and safety	selection, storage, handling, and preparation of foods and beverages	
Risk factors and clinical indicators	iron and protein status, vitamin D and folate levels, Vitamin B12 status, hemoglobin A1c; metabolic syndrome (blood lipids and glucose, blood pressure); bone density	urinary sodium, urinary contaminants; protein/calorie malnutrition; micronutrient status

<table>
<tr><td rowspan="2"> 
</td><td colspan="3">Chronic Disease Prevention
(Represented in the model by health outcomes influenced by diet and physical activity behaviors)</td></tr>
<tr><td>Health outcomes</td><td>cardiovascular diseases (coronary heart disease, heart attack, hypertension and stroke);
Type 2 diabetes; diet-related cancers (breast, colorectal, prostate, lung); neurological and psychological conditions (including cognitive function, dementia, Alzheimer’s Disease and depression); dental caries; congenital anomalies; fractures and osteoporosis; total mortality</td><td></td></tr>
<tr><td rowspan="2"> 
</td><td colspan="3">Health Promotion
(Represented in the model by diet and physical activity behaviors that promote good health through the lifespan)</td></tr>
<tr><td>Health outcomes</td><td>pregnancy course and outcomes; child and adolescent growth and development milestones; peri- and post-menopause status; musculoskeletal and bone health; mental health; gastrointestinal health</td><td>fertility; healthy aging</td></tr>
</table>

Footnote: The DGAC acknowledges that other lifestyle factors were not addressed in its report but are important in overall health, including tobacco status and use, stress and its management, medical treatment and management, medication use, and addiction.