Supplemental Nutrition Assistance Program: Examining the Evidence to Define Benefit Adequacy

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SUPPLEMENTAL NUTRITION ASSISTANCE PROGRAM

Examining the Evidence to Define Benefit Adequacy

Committee on Examination of the Adequacy of Food Resources and SNAP Allotments

Food and Nutrition Board
Committee on National Statistics

Julie A. Caswell and Ann L. Yaktine, *Editors*

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This report has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the National Research Council's Report Review Committee. The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published report as sound as possible and to ensure that the report meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process. We wish to thank the following individuals for their review of this report:

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Although the reviewers listed above have provided many constructive comments and suggestions, they were not asked to endorse the report's conclusions or recommendations, nor did they see the final draft of the report before its release. The review of this report was overseen by **NANCY E. ADLER,** University of California, San Francisco, and **JOHANNA DWYER,** Office of Disease Prevention, National Institutes of Health. Appointed by the National Research Council and Institute of Medicine, they were responsible for making certain that an independent examination of this report was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this report rests entirely with the authoring committee and the institution.

Preface

The Supplemental Nutrition Assistance Program (SNAP) touches the lives of millions of people in the United States in good and particularly in bad economic times. Over the last decade participation in the program has increased from less than 20 million to 46 million in 2012 in the wake of the post-2008 recession. As administered by the U.S. Department of Agriculture's Food and Nutrition Service (USDA-FNS), SNAP is intended to supplement the ability of individuals and households to purchase food for consumption at home with a benefit allotment that is delivered to them most commonly in the form of Electronic Benefit Cards that they can spend in food stores. With one in seven people in the United States currently receiving SNAP benefits, an assessment of the science and evidence base for defining adequate allotments is important to the well-being of these participants, as well as to the functioning of the program.

Two intertwined aspects of SNAP allotments affect the definition of an adequate benefit that supports the opportunity for participants to attain the program goals of food security and access to a healthy diet. First, a SNAP allotment may be more or less adequate for any given participant or household, depending on their circumstances. Does a particular participant have sufficient time to shop for and prepare nutritious meals, particularly from basic ingredients? How are the time and cost entailed in preparing meals affected by store availability, transportation, and the prices of foods in the participant's shopping area? How does a participant's nutrition knowledge and budgeting skills affect the definition of adequacy? Second, the program's formula for calculating the dollar amount of the SNAP allotment itself directly affects adequacy. For example, does the formula

account realistically for participants' ability to devote their own income to food purchases?

The circumstances in which foods are purchased and prepared and the food budget, including the SNAP benefit, are intertwined because they both are constraints on the opportunity of a SNAP individual or household to attain the outcomes of food security and access to a healthy diet. The definition of adequacy of SNAP allotments must weigh the importance of both aspects in affecting these outcomes. The committee members' reasoned assessment about the evidence on these two aspects resulted in its focus on defining adequacy based on individual, household, and environmental factors, as well as program factors; instituting systems to monitor the program outcomes of food security and access to a healthy diet over time, as well as to facilitate future adjustments to the definition of adequacy; and conducting research on the impacts on adequacy of nutrition knowledge and buying skills and access to retail outlets.

The day-to-day diets of millions of people in the United States are supported by the SNAP program; its impact is particularly prominent in periods of economic downturn. The committee offers its recommendations for defining and monitoring SNAP benefit allotment adequacy based on its review and analysis of a broad range of evidence, with the goal of providing USDA-FNS with a road map to establish an objective definition of the adequacy of SNAP allotments and to assist with identification of data requirements to support that effort. Ultimately this effort is aimed at providing SNAP participants with greater opportunities to become more food secure and to have access to a healthy diet.

I am deeply appreciative of the dedication and effort of the 10 committee members who worked together over a short period of time from January to December 2012 to evaluate the evidence on the multiple factors that may be important in defining the adequacy of SNAP allotments. We received outstanding support in our work from Ann Yaktine, study director. I thank her for her knowledge, skill, and tireless care devoted to this project. As research associate, Julia Hoglund provided excellent scientific support to the project. Geraldine Kennedo served as administrative assistant with efficiency and warmth. I also appreciate the consultation provided by Gooloo Wunderlich, senior program officer with the Committee on National Statistics. Finally, I thank Linda Meyers, director of the Food and Nutrition Board of the Institute of Medicine, for her wisdom in guiding the project.

Julie A. Caswell, *Chair*
Committee on Examination of the Adequacy
of Food Resources and SNAP Allotments

Contents

Summary

For many Americans who live at or below the poverty threshold, access to healthy foods at a reasonable price is a challenge that often places a strain on already limited resources and may compel them to make food choices that are contrary to current nutritional guidance. To help alleviate this problem, the U.S. Department of Agriculture (USDA) administers a number of nutrition assistance programs designed to improve access to healthy foods for low-income individuals and households. The largest of these programs is the Supplemental Nutrition Assistance Program (SNAP), formerly called the Food Stamp Program, which today serves more than 46 million Americans with a program cost in excess of $75 billion annually. The goals of SNAP include raising the level of nutrition among low-income households and maintaining adequate levels of nutrition by increasing the food purchasing power of low-income families.

Households receive the maximum SNAP benefit if the family has no net income to contribute to food purchases; households with income combine the SNAP allotment with other household resources. Currently there is debate about whether there are different ways to think about the adequacy of the SNAP allotment. Factors such as time needed to purchase and prepare foods from basic ingredients as described in the Thrifty Food Plan (TFP), knowledge and skills needed to plan and prepare healthy meals, the diversity of cultural preferences, food access constraints, and regional/seasonal price fluctuations all may have an impact on the adequacy of SNAP allotments for achieving the program goals. In addition to these individual, household, and environmental factors, program characteristics—the way the allotments are calculated (including the maximum benefit guarantee,

the benefit reduction rate, and the calculation of net income deductions)—are important to consider in defining adequate allotments. The committee reviewed the evidence for the impact of these factors and characteristics on the purchasing power of SNAP allotments and assessed their role in contributing to the feasibility of defining allotment adequacy.

STUDY TASK AND APPROACH

In response to questions about whether there are different ways to define the adequacy of SNAP allotments consistent with the program goals of improving food security and access to a healthy diet, USDA's Food and Nutrition Service (FNS) asked the Institute of Medicine (IOM) and the National Research Council (NRC) to conduct a study to examine the feasibility of defining the adequacy of SNAP allotments, specifically:

- the feasibility of establishing an objective, evidence-based, science-driven definition of the adequacy of SNAP allotments consistent with the program goals of improving food security and access to a healthy diet, as well as other relevant dimensions of adequacy; and
- data and analyses needed to support an evidence-based assessment of the adequacy of SNAP allotments.

In addressing its task, the committee considered questions posed by the sponsor with respect to the above two primary dimensions of the task. These questions provided further guidance for the committee's review of the evidence. Appendix E outlines these additional questions and indicates where they are addressed in the report.

The committee conducted a comprehensive review of the current evidence, including the peer-reviewed published literature and peer-reviewed government reports. Although not given equal weight with peer-reviewed publications, some non-peer-reviewed publications from nongovernmental organizations and stakeholder groups also were considered because they provided additional insight into the behavioral aspects of participation in nutrition assistance programs. In addition to its evidence review, the committee held a data gathering workshop that tapped a range of expertise relevant to its task.

To examine the feasibility of defining the adequacy of SNAP allotments, the committee constructed a framework (Figure S-1) showing the constraints on a household's ability to achieve program goals. To define the components of the framework and establish the boundaries of its evidence review, the committee focused on the two dimensions of its task—the feasibility of objectively defining SNAP benefit adequacy consistent with improving food security and access to a healthy diet, and data and analyses

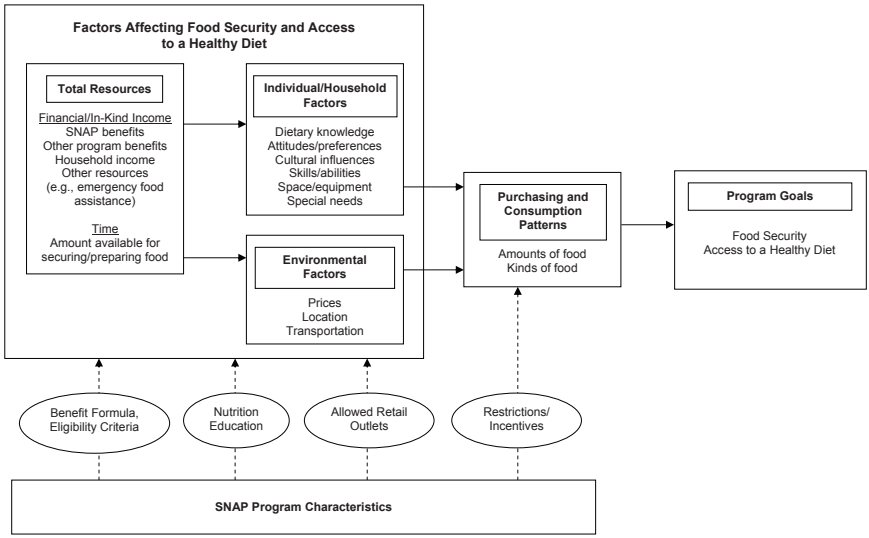

FIGURE S-1 Framework for determining the feasibility of defining the adequacy of SNAP allotments.
NOTE: Solid lines represent the food purchasing and consumption process for households participating in SNAP, independent of the program. Dashed lines represent the influence of SNAP program characteristics on this process.

needed to support an objective, evidence-based assessment of benefit adequacy. The committee's framework describes how the SNAP program fits into a household's overall process of acquiring and providing food for all family members. It consists of three major parts: (1) the program goals of food security and access to a healthy diet; (2) total resources, individual/household factors, and environmental factors that influence the process through which households purchase and consume foods; and (3) elements of the SNAP program characteristics that interact with the process through which households may achieve program goals.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The committee's conclusions are based on the findings derived from its review of the available evidence. These conclusions formed the basis for the committee's recommendations.

Conclusion 1: The Adequacy of SNAP Allotments Can Be Defined

Based on the available evidence, it is feasible to define objectively the adequacy of SNAP allotments. Doing so entails identifying the factors that affect the ability of participants to attain food security and access to a healthy diet. The committee's review of the evidence found that it is possible to identify those factors, and the committee has done so in its framework and in the following two conclusions and the findings that support them. The available evidence has some limitations, but it is possible to obtain the evidence needed for a science-driven definition of allotment adequacy. First, evidence must be taken into account on the degree to which specific individual, household, and environmental factors influence SNAP participants' purchasing power, given a dollar value of their SNAP benefits. Second, evidence must take into account the impact of factors related to the computation of the dollar value of the SNAP allotment itself, as well as other SNAP program characteristics.

Conclusion 2: The Adequacy of SNAP Allotments Is Influenced by Individual, Household, and Environmental Factors

Evidence obtained by the committee in its data gathering workshop and in its review and assessment of the literature revealed that the opportunity for SNAP participants to meet the program goals, given a dollar value of their SNAP benefits, is influenced by a number of individual, household, and environmental factors that impact the purchasing power of the allotments. The committee found that a definition of the adequacy of SNAP allotments must account for these factors according to the magnitude and significance of their influence on the allotment's purchasing power. Although SNAP allotments might be adequate in the absence of these factors, the evidence suggests that these factors can act as barriers to obtaining nutritious foods and preparing nutritious meals consistent with the assumptions of the Thrifty Food Plan (TFP). The evidence on individual, household, and environmental factors that constrain the purchasing power of SNAP allotments is most robust for four factors:

- The SNAP allotment, which is based on the TFP, assumes the purchase of many basic, inexpensive, unprocessed foods and ingredients requiring substantial investment of participants' time to produce nutritious meals. The evidence shows that the time requirements implicitly assumed by the TFP are inconsistent with the time available for most households at all income levels, particularly those with a single working head. By failing to account for the fact that SNAP participants, like other households, need to purchase

value-added foods that save preparation time, the current value of the SNAP allotment substantially limits the flexibility and purchasing power of SNAP benefits.

- The food prices faced by SNAP participants vary substantially across geographic regions of the country and between rural and urban areas. However, SNAP benefits are adjusted only for Alaska and Hawaii. SNAP participants in locales with higher food prices are likely to find it more difficult than those in areas with lower prices to purchase the types and amounts of foods specified in the TFP as adequate to meet their needs for a nutritious diet. The evidence points further to a lack of data on the extent to which food prices influence the ability of SNAP participants to purchase nutritious foods.
- There is evidence that low-income households face higher transaction costs in achieving food security and access to a healthy diet relative to higher-income households. For example, low-income and minority populations are more likely than other groups to experience limited access to supermarkets and other large retail outlets, such as big-box stores, that offer a broad range of nutritious foods at reasonable cost. Individuals without access to such venues experience greater disparity in the availability of healthy foods, such as fresh fruits and vegetables, in their neighborhood food outlets. In addition, a lack of transportation infrastructure commonly leads to limited food access in small towns and rural areas.
- Nutrition education programs for low-income participants that include training in food purchasing and preparation skills appear to have some effectiveness in changing behavioral outcomes. This finding lends credence to the theory that skills are a limiting factor in the ability of some SNAP participants to maximize the purchasing power of the current SNAP allotments. However, existing evidence on the influence of nutrition knowledge and skills on the ability of SNAP participants to purchase and prepare nutritious foods consistent with the assumptions of the TFP is insufficient to support a conclusion about the relevance of these factors to an evidence-based definition of the adequacy of SNAP allotments.

Conclusion 3: The Adequacy of SNAP Allotments Is Influenced by Program Characteristics

The evidence suggests that a number of factors related to how the dollar value of SNAP allotments is calculated, as well as other SNAP program characteristics, can influence the feasibility of defining an adequate SNAP allotment. The evidence supports the conclusion that the maximum

monthly benefit, the benefit reduction rate, and the net income calculation have important impacts on the definition of the adequacy of SNAP allotments.

- **Maximum benefit guarantee—**The maximum SNAP benefit, currently based on assumptions of the TFP plus the temporary upward adjustment that occurred under the American Recovery and Reinvestment Act of 2009, may not always be sufficient to allow participants to purchase the food components and prepare the meals specified by the TFP for several reasons. As noted above, the time available for most households at all income levels, particularly those with a single working head, is insufficient to meet the assumptions of the TFP, and thus the allotments do not sufficiently account for the costs of purchasing foods that must be further prepared. Also as noted above, the TFP does not account for many types of geographic price variation. In addition, limited evidence suggests that some SNAP households with no net income as defined under the program and residing in high-cost locales with limited access to food outlets are unable to purchase the foods included in the market basket underlying the TFP. Although the committee found compelling evidence on the time costs of meal preparation and on geographic price variations, the evidence on how best to incorporate these factors into the SNAP benefit formula is less compelling. The committee also identified as an issue affecting the adequacy of SNAP allotments the fact that the annual maximum benefit update occurs following a 16-month lag. The June cost of food is used to update the TFP in October, but then is not updated again until the following October, 16 months later. Because of the impact of inflation and other factors on food prices, this lag in the benefit adjustment can significantly reduce the purchasing power of SNAP allotments.
- **Benefit reduction rate—**The original assumption underlying the benefit reduction rate is that the average U.S. household spends 30 percent of its income on food. This assumption is outdated and inconsistent with the current average spending pattern across income levels in the United States of about 13 percent of pretax income spent on purchases of all food consumed, both at home and away. Although lower-income households spend a greater portion of their income on food (e.g., 16.8 percent in 2010) compared with higher-income households (e.g., 11.7 percent in 2010), the percentage is still substantially less than the 30 percent assumption currently used or the lower effective benefit reduction rate that results after other parts of the benefit formula have been applied.

Evidence suggests that a lower benefit reduction rate more closely aligned with current household spending patterns would likely give households greater incentive to combine workforce participation with the receipt of SNAP benefits by reducing the penalty for working.

- **Calculation of net income deduction—**The committee found evidence that several program characteristics used to determine net income and the monthly allotment may not adequately capture the impact of additional extraordinary household costs that reduce the allotment's purchasing power. Regarding the shelter deduction, considerable evidence shows that a substantial proportion of SNAP households face housing costs in excess of the current cap on the shelter deduction, which results in overestimation of the net income participants have available to purchase food. Deductions allowed for medical expenses for persons 60 and older and the disabled may influence the purchasing power of the allotment for those individuals but do not address out-of-pocket medical costs for nonelderly, nondisabled participants, although more evidence is needed to understand the impact of such expenses on the adequacy of the SNAP allotment. Evidence is more limited on whether the current 20 percent earned income deduction is adequate to cover the additional expenses incurred by SNAP recipients who work.

Recommendations

The committee offers its recommendations in three areas. First, it recommends elements that should be included by USDA-FNS in an evidence-based, objective definition and measurement of the adequacy of SNAP allotments. Second, it recommends monitoring and assessment of the adequacy of SNAP allotments, needed for evaluation and adjustment over time. Third, it recommends additional research and data needed to support an evidence-based definition of allotment adequacy. In addition, the committee describes other research considerations that would further understanding of allotment adequacy. Specific data and analytical challenges to the primary research effort are identified at the conclusions of Chapters 3 and 4.

Defining and Measuring the Adequacy of SNAP Allotments

To define the adequacy of SNAP allotments objectively using currently available evidence requires consideration of a range of factors identified by the committee as likely to have an impact on the allotments' purchasing power. As a first step, the committee established a framework for consider-

ing factors that can have an impact on defining allotment adequacy. With this in mind, the committee offers the following recommendations.

Recommendation 1: In defining allotment adequacy, the U.S. Department of Agriculture (USDA) Food and Nutrition Service (FNS) should include consideration of the influence of specific individual, household, and environmental factors on Supplemental Nutrition Assistance Program (SNAP) participants' purchasing power given the dollar value of their SNAP benefits. Specific individual, household, and environmental factors to consider in a definition of the adequacy of SNAP allotments are

- ***Time*—USDA-FNS should recognize the cost–time trade-offs involved in procuring and preparing a nutritious diet. The dollar value of the Thrifty Food Plan (TFP), with its strong reliance on preparation of meals from basic ingredients, does not account for time constraints faced by most households at all income levels, particularly those with a single working head of household, which necessitate purchasing value-added or prepared foods with a higher cost. USDA-FNS should examine the impact of accounting for cost–time trade-offs, for example, by**
  - **—applying a time adjustment multiplier to the cost of the TFP or reviewing options for adjustments to the current cost of the plan, and**
  - **—adjusting the earned income deduction to reflect more accurately time pressures for participants who are working.**
- ***Geographic price variation*—USDA-FNS should recognize the substantial variation in food prices that exists across geographic regions of the contiguous United States and between rural and urban areas. USDA-FNS should examine possible approaches to accounting for this variation, such as through adjustments to the maximum benefit that take into account**
  - **—pricing or price adjustments for food in high-cost (including urban and rural areas) as well as low-cost regions;**
  - **—whether the shelter cap should be increased, particularly in high-cost regions; and**
  - **—alternatives to the TFP, such as the Low-Cost Food Plan.**
- ***Access to food outlets*—USDA-FNS should assess the impact of limited access to certain food outlets (e.g., supermarkets) that may affect the ability of some SNAP participants to purchase a variety of healthy foods at reasonable cost. Evaluation and assessment of access barriers should include the degree to which, and for whom, they constrain the SNAP allotment that would otherwise be adequate to meet the program goals.**

Recommendation 2: In defining allotment adequacy, U.S. Department of Agriculture (USDA) Food and Nutrition Service (FNS) should also consider evaluating specific program characteristics that affect the allotment's actual dollar value, as well as the extent to which the allotment is targeted to individual Supplemental Nutrition Assistance Program (SNAP) participants. Specific program characteristics to consider in a definition of allotment adequacy are

- ***Maximum benefit guarantee*—USDA-FNS should evaluate the need to**
  - **—adjust the current timing scheme for the cost-of-living adjustment to the Thrifty Food Plan (TFP) to reduce the 16-month lag in updates;**
  - **—update adjustments for economies of scale to reflect current data on the impact of family size on family food spending; and**
  - **—correct for misalignment in the assumptions of the TFP that serve as the basis for determining the maximum benefit guarantee to account for current lifestyle and meal patterns that include the purchase of food products that reduce the need for in-home preparation time.**
- ***Benefit reduction rate*—USDA-FNS should evaluate whether there is a need to adjust downward the current benefit reduction rate, which is currently set at 30 percent but has a lower effective rate, to reflect the current purchasing behaviors of U.S. households.**
- ***Calculation of net income*—USDA-FNS should evaluate whether there is a need to adjust the design of the net income calculation to better reflect the ability of SNAP participants to purchase food within the boundaries of their incomes. Particular attention should be given to the adequacy of the current earned income deduction; the cap on the excess shelter deduction; and the possibility of expanding the out-of-pocket medical deduction to nonelderly, nondisabled populations.**

Monitoring Assessment of the Adequacy of SNAP Allotments

The committee's findings suggest that an evidence-based definition of the adequacy of SNAP allotments requires ongoing monitoring of the ability of SNAP participants to use the allotments to achieve the program goals. To this end, it is important to know the proportion of SNAP participants that are more food secure and consuming healthier diets as a result of the program, and within what time frame. Understanding the impact of SNAP benefits on these outcomes would contribute to the broader knowledge base used to define the adequacy of SNAP allotments.

Recommendation 3: To assess the correspondence between the definition of an adequate Supplemental Nutrition Assistance Program (SNAP) allotment and the attainment of the program goals, and to adjust the definition of adequacy as information on influencing factors evolves, U.S. Department of Agriculture (USDA) Food and Nutrition Service (FNS) should

- **Develop longitudinal datasets containing appropriate measures of food insecurity, access to a healthy diet, and SNAP participation as part of the evidence base it uses to define adequacy.**
- **Assess existing and establish new evaluation protocols that can measure the impact of SNAP participation on food security and access to a healthy diet, accounting for selection biases (e.g., that SNAP participants may be more likely to be food insecure than the general low-income population).**
- **Evaluate additional nutrition monitoring tools, including a standardized measurement tool with which to monitor and assess the ability of SNAP allotments to support a dietary pattern consistent with the *Dietary Guidelines for Americans*. The committee identified the Healthy Eating Index as one example of a measure that could be adapted to assess whether SNAP participants are meeting recommended dietary goals.**

Meeting Additional Research Needs

The committee identified several factors related to SNAP program participation that may affect whether some SNAP participants are able to meet the program goals and for which evidence is currently inadequate to fully assess their importance. These factors may affect either directly or indirectly the definition of the adequacy of SNAP allotments. The two broad areas in which additional research is needed to further develop the knowledge base for the potential use of these factors in defining allotment adequacy are educational programs that can help participants increase the purchasing power of the SNAP allotment and access to retail outlets and foods.

Recommendation 4: U.S. Department of Agriculture (USDA) Food and Nutrition Service (FNS) should conduct further research in the following areas to support the definition of allotment adequacy:

- **To better assess how participants' understanding of nutrition and resource management skills affect the adequacy of Supplemen-**

tal Nutrition Assistance Program (SNAP) allotments, USDA-FNS should

—assess whether and how strengthening the quality (content and delivery mechanisms) of education in nutrition and resource management skills can support allotment adequacy, for example, through educational outreach such as demonstration projects, and evaluate the level of funding needed to support such programs; and

—assess how effectively these educational programs align with the needs of SNAP participants and the program's potential to enhance the purchasing power of SNAP allotments.

- **To evaluate the impact of access to retail outlets on the opportunity for SNAP participants to be food secure and to make nutritious food choices, USDA-FNS should conduct periodic regional cross-sectional surveys to gather information on the cost and availability of foods that are consistent with the recommendations of the *Dietary Guidelines for Americans*.**

FINAL THOUGHTS

The committee reviewed a range of evidence applicable to the feasibility of defining the adequacy of SNAP benefits in terms of whether the SNAP allotment enables program participants to meet program goals, given their benefit allotment, not whether all participants will in fact reach these goals. The committee's recommendations are structured to assist USDA-FNS in establishing an objective definition of the adequacy of the SNAP allotment, taking the evidence for these factors into consideration, and to identify specific data and analysis requirements to support an evidence-based assessment of allotment adequacy.

1

Introduction and Conceptual Framework

For many Americans who live near or below the poverty threshold, access to healthy foods at a reasonable price is a challenge that often places a strain on already limited resources and may compel them to make food choices that are contrary to current nutritional guidance. To help alleviate this problem, the U.S. Department of Agriculture (USDA) administers a number of nutrition assistance programs with the goal of improving access to healthy foods for low-income individuals and households; USDA also promotes healthy eating through nutrition education programs designed to reach low-income populations and program participants. The largest of USDA's nutrition assistance programs is the Supplemental Nutrition Assistance Program (SNAP), formerly called the Food Stamp Program, which today serves more than 46 million Americans with a program cost in excess of $75 billion annually. The goals of SNAP include raising the level of nutrition among low-income households and maintaining adequate levels of nutrition by increasing the food purchasing power of low-income families.

Households receive the maximum SNAP benefit if the family has no income to contribute to food purchases; households with income combine the SNAP allotment with other household resources. Currently there is debate about whether there are different ways to think about the adequacy of SNAP allotments. The purpose of this report is to assist USDA's Food and Nutrition Service (FNS) in responding to this debate.

OVERVIEW OF THE PROGRAM

SNAP differs from other USDA nutrition assistance programs in that it is an in-kind program, providing monthly benefits paid by some means other than cash (e.g., an Electronic Benefit Transfer [EBT] card or a voucher) to eligible low-income families.[1] The goals of the program are to improve food security and access to a healthy diet by increasing the food purchasing power of low-income households, enabling them to obtain a more nutritious diet by preparing food at home. The purpose and goals of SNAP as legislated by Congress on January 3, 2012, are shown in Box 1-1. Additional detail on the history, background, and goals of the program is in Chapter 2.

The EBT card can be used to purchase food from authorized food retailers; benefits also may be used to purchase seeds and plants with which to produce food. With certain exceptions, including alcohol and tobacco products and foods eaten in a store, the program does not directly influence what foods can be purchased using SNAP benefits. To be eligible to sell foods to SNAP participants, a store must meet one of two criteria. First, it must offer (on a continuous basis) at least three varieties of qualifying foods in each of four food categories, including perishable foods in at least two of the categories:

- meat, poultry, or fish;
- bread or cereal;
- vegetables or fruit; and
- dairy products

The second criterion is that more than 50 percent of total retail sales in the store must be from the sale of SNAP-eligible staple foods.

SNAP allotments are based on the Thrifty Food Plan (TFP), a minimal-cost model food plan for a healthy diet that is based on the cost of purchasing foods consumed by individuals in four age-gender groups: a male and female aged 19-50, a child aged 6-8, and a child aged 9-11. As noted by Carlson et al. (2007), the plan reflects the recommendations of the *Dietary Guidelines for Americans* (DGA). The amount of individual allotments varies because the calculation of benefit levels is based on the concept that SNAP allotments are intended to supplement, not serve as the sole resource for, food purchases. Households with a net income below 100 percent of the federal poverty level qualify for a benefit equal to the maximum amount for that household size minus 30 percent of their net income. However, ris-

[1]For simplicity, the form in which SNAP benefits are provided is referred to throughout this report as an EBT card.

BOX 1-1
Statement of Legislative Purpose and Goals of the Supplemental Nutrition Assistance Program

Section 2 of 7 U.S.C. 2011 states: "It is hereby declared to be the policy of Congress, in order to promote the general welfare, to safeguard the health and well-being of the Nation's population by raising the level of nutrition among low-income households. Congress hereby finds that the limited food purchasing power of low-income households contributes to hunger and malnutrition among members of such households. Congress further finds that increased utilization of food in establishing and maintaining adequate national levels of nutrition will promote the distribution in a beneficial manner of the Nation's agricultural abundance and will strengthen the Nation's agricultural economy, as well as result in more orderly marketing and distribution of foods. To alleviate such hunger and malnutrition, a supplemental nutrition assistance program is herein authorized which will permit low-income households to obtain a more nutritious diet through normal channels of trade by increasing food purchasing power for all eligible households who apply for participation."

ing food prices, fuel and shelter costs, and employment and income volatility all have affected the food purchasing power of the allotment.

Several nutrition assistance programs are available to qualifying low-income households, including the four largest (SNAP; the National School Lunch and School Breakfast Programs; and the Special Supplemental Nutrition Program for Women, Infants, and Children [WIC]), as well as other programs such as the Child and Adult Care Food Program (CACFP), the Commodity Supplemental Food Program, the Emergency Food Assistance Program, the Food Distribution Program on Indian Reservations, and the Summer Food Service Program. Participation in more than one nutrition assistance program increases low-income families' access to a healthy diet. Yet while many families are eligible to participate in more than one such program (e.g., SNAP, School Lunch, School Breakfast, and WIC), most do not. Gothro and Trippe (2010), for example, found that fewer than half of all individuals participating in School Lunch, School Breakfast, and WIC also received SNAP benefits, even though they were eligible to do so. SNAP does differ from other federal nutrition assistance programs, such as WIC, CACFP, School Lunch, and School Breakfast, in that, with the exceptions mentioned previously, it does not limit the types of foods available to participants.

Participation in SNAP varies across demographic groups, but about half of all participants are households with children. A recent USDA-FNS report

shows that SNAP participation by children in households that are below the federal poverty threshold and are participants in Temporary Assistance for Needy Families has remained high (89 to 92 percent of all eligible individuals are in these groups), whereas participation by the elderly, low-income individuals living in households above the federal poverty threshold, and those eligible for low monthly benefits has remained low (less than 40 percent of all eligible individuals in these groups) over several decades.

Overall participation in SNAP fluctuated between 1999 and 2002 to just below and just above 18 million. It then increased steadily to 27 million in 2008. As the 2008 recession led to higher unemployment, the number of eligible individuals increased by more than 18 percent between 2008 and 2009, reaching 32 million by the end of fiscal year (FY) 2009 (Leftin et al., 2011). In FY 2012, SNAP participation reached more than 46 million, with a program cost in excess of $75 billion (FNS, 2012).

THE COMMITTEE'S TASK

This study poses questions about whether there are different ways to think about the adequacy of SNAP allotments. Factors such as time needed to prepare foods from basic ingredients as described in the TFP, knowledge and skills needed to plan and prepare a healthy diet, the diversity of cultural food preferences, food access constraints, and regional/seasonal price fluctuations all may have an impact on the adequacy of the allotments to improve food security and access to a healthy diet. Accordingly, USDA-FNS asked the Institute of Medicine to conduct a study examining the feasibility of defining the adequacy of SNAP allotments, specifically:

- the feasibility of establishing an objective, evidence-based, science-driven definition of the adequacy of SNAP allotments consistent with the program goals of improving food security and access to a healthy diet, as well as other relevant dimensions of adequacy; and
- data and analyses needed to support an evidence-based assessment of the adequacy of SNAP allotments.

In addressing its task, the committee considered questions posed by the sponsor with respect to the above two primary dimensions of the task. Appendix E outlines these additional questions and indicates where they are addressed in the report.

The committee's task was focused on identifying factors that evidence indicates should be considered in defining SNAP allotments that are adequate to meet the program goals, and the data and analyses needed to support such a definition. This focus did not include consideration of alternatives to SNAP; modifications to its underlying TFP; alternative disbursement

mechanisms, such as cash in lieu of EBT cards; or the impact of program changes on program costs. Nor did the committee consider the many possible questions concerning SNAP program policy on topics not related to the feasibility of defining adequate SNAP allotments or the evidence needed to support such a definition. The committee also did not evaluate the stated program goals of improving food security and access to a healthy diet.

APPROACH TO THE TASK

The committee conducted a comprehensive review of the current evidence, including the peer-reviewed published literature, peer-reviewed government reports, and non-peer-reviewed publications from sources that included nongovernmental organizations and stakeholder groups. The process the committee used to review and weigh the strength of the evidence is described in detail in Appendix D. In addition to its evidence review, the committee held a data gathering workshop that tapped a range of perspectives (see Appendix C). Based on that evidence, the committee developed a framework identifying the range of factors most likely to have an impact on defining the adequacy of SNAP allotments. This framework and the supporting evidence are discussed below and in subsequent chapters.

THE FRAMEWORK AND ITS COMPONENTS

The framework developed for this study provides a structure for showing the process by which households make food choices. The framework also identifies how SNAP program characteristics affect this process. The committee used this framework to identify the types of factors that may affect whether the SNAP goals of improving food security and access to a healthy diet are met in order to help determine the feasibility of defining allotment adequacy. The framework consists of three major parts: (1) the program goals of improving food security and access to a healthy diet; (2) major categories of factors that influence the process through which households may or may not achieve these goals; and (3) characteristics of the SNAP program that also affect this process. The committee did not focus on strategies that can be used to encourage participation in the SNAP program; rather, it focused on what is occurring among SNAP participants that may impact the adequacy of the benefits they receive.

Program Goals

The key goals of the SNAP program from the time of its inception have included alleviating hunger and improving eating patterns to optimize health outcomes. The statement of task for this study identified the program

goals associated with an adequate SNAP allotment as improving food security and access to a healthy diet. The maximum SNAP allotment, based on the TFP, is intended to provide participating households an amount that, together with their own resources, is sufficient to enable them to be food secure and to follow a healthy meal pattern, consistent with the recommendations of the DGA (USDA and HHS, 2010).

Food Security

Food insecurity exists when there is inadequate or unsure access to enough food for active, healthy living. For the program goal of improving food security, the committee used USDA's widely accepted definition of food security:

> Access by all people at all times to enough food for an active, healthy life. Food security includes at a minimum: (1) the ready availability of nutritionally adequate and safe foods, and (2) an assured ability to acquire acceptable foods in socially acceptable ways (e.g., without resorting to emergency food supplies, scavenging, stealing, or other coping strategies). (Bickel et al., 2000)

As discussed further in Chapter 2, food insecurity in the United States is monitored by the Food Security Supplement survey, conducted by the U.S. Census Bureau and used as a source of information by the Bureau of Labor Statistics. Trends in monitoring show that food insecurity in the United States rose sharply from 2006 to 2007 and has remained at roughly the same level since. SNAP has a role as an "automatic stabilizer" for low-income households; both participation and the amount of spending increase automatically during economic downturns. Even with the dramatic rise in SNAP participation in recent years, this measure suggests that the antipoverty impact of SNAP is increasing as an outcome of the American Recovery and Reinvestment Act of 2009[2] (Ziliak, 2011), as well as other factors, including increasing resources for the purchase of food (see Chapter 2 for further detail).

Access to a Healthy Diet

For its definition of the program goal of access to a healthy diet, the committee relied on the recommendations of the DGA as federal nutrition policy. The TFP, which as noted is the basis for calculating the maximum

[2]American Recovery and Reinvestment Act of 2009, Public Law 111-5, 111th Congress (February 17, 2009).

SNAP benefit, was revised in 2006 to reflect the guidance provided by the DGA. As an outcome of this revision, the maximum amount of the SNAP allotment is now intended to provide participating households with access to a healthy meal pattern, consistent with the recommendations of the DGA. Thus, the committee defined this program goal as access to a healthy diet consistent with the recommendations of the DGA.

As discussed further in Chapter 3, several dietary indexes have been developed as comprehensive measures of a healthy diet. Examples include the USDA-developed Healthy Eating Index (HEI)-2005; the Alternate HEI-2010; the MyPyramid food guidance system; and other measures of diet quality developed by academic and other groups, such as the Recommended Food Score.

Factors Affecting Achievement of the Program Goals

A number of factors affect whether households have the opportunity to be food secure and have access to a healthy diet. Obviously, a critical factor is whether a household has sufficient total resources (financial/in-kind income and time) with which to obtain an adequate amount of nutritious food. With a given level of resources, however, various other factors, both within and outside the control of the household, influence whether those resources actually translate into food security for the household and access to a healthy diet for its members. Key among these factors are characteristics of the household and its individual members, including taste preferences, cultural influences, and special dietary needs, which may influence the types of foods obtained, as well as environmental factors, such as the household's physical access to food and prices that may affect access. All of these factors ultimately influence the actual purchasing and consumption patterns of the household, which in turn affect whether members of the household meet the program goals, as illustrated in Figure 1-1.

Total Resources

A household's ability to become food secure and have access to a healthy diet depends at a minimum on having sufficient total resources. Total household resources include two main components: financial/in-kind income and time. Financial resources may include household income, in-kind benefits received from participation in SNAP and other nutrition assistance programs (e.g., WIC), and food obtained through emergency food programs. In addition, the committee recognized that time plays a major role in ultimately determining a household's food choices and dietary outcomes. In particular, time is needed to apply for benefits, to procure food, and to prepare meals for the household. Households take into account all

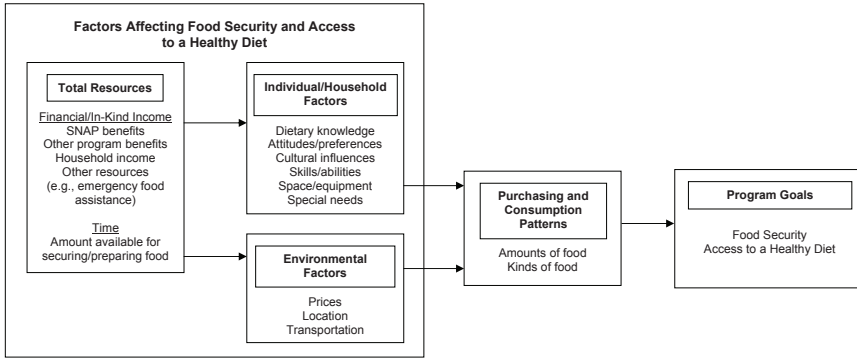

FIGURE 1-1 Factors affecting the process by which households may or may not achieve SNAP program goals.

of these resources at their disposal when they make decisions about what foods they will obtain and consume.

Individual and Household Factors

Even with a given level of total resources, different households (and individuals within them) will make different food choices. One reason for this variation is that individual and household factors greatly influence the types of foods families choose. In particular, personal preferences and cultural influences play a major role in decisions about what foods to obtain and consume. Different individuals may consume different amounts of fruits or vegetables not because of their available resources or the prices of these items, for example, but because of their taste for these foods. Other individual/household factors that may influence or constrain household food choices include food and nutrition knowledge, food preparation skills and the space and equipment needed to prepare foods from basic ingredients, food budgeting abilities, and special needs for certain age groups and for the management of disease (e.g., nutrient deficiencies, infectious and chronic diseases). Because all these factors influence the amounts and types of foods obtained for a household at a given level of total resources, they may influence the feasibility of defining the adequacy of SNAP allotments. These themes are further developed in Chapter 4.

Environmental Factors

Many environmental factors may influence SNAP participants' access to food, including factors that physically or financially facilitate or impede

the household's ability to meet the program goals. Factors that reflect physical access include transportation, proximity to outlets providing nutritious foods, and limitations on access for those with a physical handicap. Factors that reflect financial access include food prices; gas prices; and the cost of complementary goods used in home food production and consumption, such as expenditures for housing and utilities. Also playing a role might be actual or perceived access, such as an individual's belief that nutritious foods can be found for a reasonable price in his or her neighborhood. As with individual/household factors, the various environmental factors affecting access to food may operate independently of a household's total resources. For households with a given level of resources, for example, those in areas in which the relative prices of fruits and vegetables are higher than average may be less likely to choose to obtain and consume those items than households in areas with less expensive fruits and vegetables. Further detail on these environmental factors related to access to food is presented in Chapter 4.

Purchasing and Consumption Patterns

As noted, the actual purchasing and consumption patterns of low-income households will ultimately be influenced by the total resources available to the household, individual and household factors, and environmental factors that affect access to or the ability to procure different types of foods. In turn, the amounts and types of foods chosen and purchased by low-income households and the foods consumed by household members will directly affect the household's ability to meet the goals of the SNAP program. These themes are further developed in Chapters 3 and 4.

SNAP Program Characteristics

While Figure 1-1 describes the process determining households' ability to meet the SNAP goals, it does not explicitly lay out the role of the program in this process. This section presents the logic of the SNAP intervention and explains how it may help households achieve improved food security and access to a healthy diet. Addition of the influence of the SNAP program characteristics to the process depicted in Figure 1-1 completes the framework for this study, as illustrated by Figure 1-2.

SNAP Benefit Formula

The most fundamental way in which the SNAP program intervenes in the process described above is by aiming to enhance the resources available for obtaining foods through SNAP benefits. SNAP allotments are determined by a formula that is described in detail in Chapter 2. At the heart of

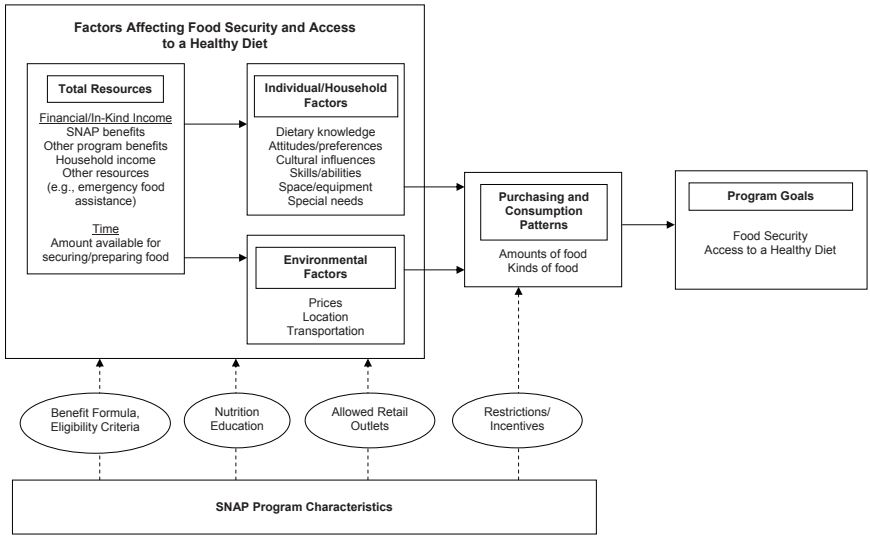

FIGURE 1-2 Framework for determining the feasibility of defining the adequacy of SNAP allotments.
NOTE: Solid lines represent the food purchasing and consumption process for households participating in SNAP, independent of the program (Figure 1-1). Dashed lines represent the influence of SNAP program characteristics on this process.

this formula is a determination of the amount of total resources (financial/in-kind, and time) necessary to obtain and prepare sufficient foods for a nutritious diet. In the current program, this determination is embodied in the TFP. Calculation of the cost of the TFP is based on the average annual (across four quarters) and regional cost for each food item in the plan, taken from the Quarterly Food-at-Home Price Database (available at http://www.ers.usda.gov/data-products/quarterly-food-at-home-price-database.aspx). Foods from the database used in calculating the cost of the plan are chosen to be representative of foods actually consumed by low-income households. The foods identified for this hypothetical average market basket are then assessed against the recommendations of the DGA and the corresponding MyPyramid meal patterns by gender and age group. TFP is considered adequate for meeting the nutritional needs of the population based on the assumptions that SNAP beneficiaries

- purchase the foods that make up the TFP;
- are able to capitalize on the average cost per item (i.e., minimal cost fluctuation by season or region of the United States is assumed);

- have access to affordable nutritious foods;
- have the time and knowledge to cook most of their meals from scratch; and
- have nutrient requirements consistent with Dietary Reference Intake (DRI) levels.

Other SNAP Program Characteristics

Aside from the SNAP benefit formula, other characteristics of the program may affect households' food purchasing and consumption behavior. There are program components that affect or at least have the ability to affect each aspect of the conceptual framework that ultimately influences achievement of the program goals, as described below.

Nutrition education Although most individual and household factors that affect purchasing and consumption patterns are independent of participation in SNAP, the program's nutrition education program (SNAP-Ed) has the potential to influence some of these factors and thereby have an impact on the purchasing power of SNAP allotments. For example, although SNAP-Ed has a limited reach, nutrition education may influence the dietary knowledge and attitudes of household members, food preparation techniques, budgeting, and planning. Ultimately, it could indirectly affect participants' tastes and preferences for foods (see Chapter 4 for further discussion).

Allowed retail outlets As noted earlier, the SNAP program sets requirements for retail outlets to qualify to accept SNAP benefits: they must sell food for home preparation, and they must offer a specified variety of food items, or at least 50 percent of their total sales volume must be in staple foods. The SNAP program also does not allow the use of benefits for hot prepared meals in approved outlets or, with the exception of the elderly and disabled, in community feeding centers. The specification of approved outlets may affect the range of access to healthy foods (see Chapter 5 for further discussion).

Restrictions and incentives As with access to retail food outlets, policies regarding restrictions on foods that can be purchased with SNAP benefits often involve a trade-off between competing goals of trying to boost participants' access to all foods and trying to encourage participants to obtain healthy foods. To circumvent this trade-off, options such as providing incentives (e.g., a rebate for each targeted item that is purchased) have been considered to guide participants toward purchasing healthier foods with their benefits (see Chapter 5 for further discussion).

Limitations of the Framework

The committee used the framework to understand the process by which households participating in SNAP may or may not achieve the program goals, as well as how program characteristics affect this process. Nonetheless, the framework has some important limitations. As discussed above, it focuses only on the proximal goals of improving food security and access to a healthy diet and does not explicitly cover longer-term outcomes that may be most important, including health outcomes such as chronic disease. A related issue is that the framework represents the program goals simply as binary measures, with participants either achieving or failing to achieve them. Especially in the case of access to a healthy diet, this representation fails to capture the multiple dimensions of the complex relationship between diet and health.

Another limitation of the framework is its linearity; it represents complex household processes for purchasing and consuming specific foods as resulting in a straightforward way from a set of exogenous influences (total resources, individual/household factors, and environmental factors). In reality, the process probably is not entirely linear, and there are likely various feedback mechanisms at work. For example, not only may the foods participants consume be affected by their individual tastes and preferences, but their tastes and preferences themselves may be affected by the foods they consume. Similarly, food insecurity and lack of a healthy diet increase the risk for chronic diseases, such as diabetes and hypertension, that in turn affect participants' consumption choices and even their access to foods needed to meet their needs.

Despite the framework's limitations in capturing subtleties in how households make decisions about what foods to purchase and consume, the committee believes it provides an adequate overview of this process. This overview serves as a useful way to understand the factors that affect food security and access to a healthy diet, how SNAP allotments affect household choices, and how the allotments may or may not be adequate for allowing participants to achieve the program goals.

ORGANIZATION OF THE REPORT

The remainder of this report is structured according to the framework depicted in Figure 1-2. First, however, Chapter 2 provides historical information about the development of the SNAP program, as well as background on the program and its goals. Chapter 3 presents evidence on the extent to which SNAP participants achieve the program goals, as well as on household purchasing patterns. Chapter 4 addresses the individual and household factors that affect participants' food choices, along with some

of the environmental factors that may limit their access to low-cost healthy foods. Chapter 5 describes the structure of SNAP and how various program characteristics affect participating households' purchasing and consumption patterns. Particular attention is paid to the additional resources provided to households through SNAP allotments and the formula used to determine the amount of the allotments. Lastly, the committee's conclusions and recommendations are presented in Chapter 6. The appendixes provide additional material, including a description of the committee's review and evaluation of the relevant literature.

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2

History, Background, and Goals of the Supplemental Nutrition Assistance Program

The U.S. Department of Agriculture (USDA) includes among its goals to increase food security and reduce hunger by increasing access to food, a healthful diet, and nutrition education for low-income Americans. Nutrition assistance programs offered by USDA include the Supplemental Nutrition Assistance Program (SNAP); the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC); the National School Lunch and School Breakfast (School Meals) Programs, including summer food service; the Child and Adult Care Food Program (CACFP); Food Assistance for Disaster Relief; the Emergency Food Assistance Program; the Food Distribution Program on Indian Reservations; and food distribution programs such as the Commodity Supplemental Food Program. SNAP, formerly called the Food Stamp Program, is the nation's largest nutrition assistance program and a key automatic stabilizer of family well-being during economic downturns. In fiscal year (FY) 2011, SNAP served more than 46 million Americans at a cost of more than $75 billion (FNS, 2012a). This chapter reviews the history of SNAP, the SNAP benefit formula and eligibility, the definition of the SNAP allotment, trends in program participation and costs, and trends in food insecurity and poverty and how they are affected by the SNAP program. The final section presents conclusions.

MILESTONES IN THE HISTORY OF THE SUPPLEMENTAL NUTRITION ASSISTANCE PROGRAM

SNAP is administrated by USDA in cooperation with state social service agencies. The authorizing legislation states that the program is intended to

BOX 2-1
The Thrifty Food Plan

The Thrifty Food Plan (TFP) is a model-based market basket of foods that represents a nutritious diet at minimal cost and serves as the basis for establishing the maximum Supplemental Nutrition Assistance Program (SNAP) benefit. TFP market baskets stipulate the type and quantity of foods for home consumption that correspond to a nutritious and low-cost dietary pattern at the level of the maximum SNAP benefit. Revisions in the last update, in 2006, reflected recent changes in dietary guidance, as well as new information on food composition, consumption patterns, and inflation-adjusted food price changes. It should be noted, however, that some nutrient goals, such as reducing sodium and increasing vitamin E and potassium intake for certain age groups, cannot be met without substantial changes to usual dietary patterns and/or changes in current food manufacturing processes.

"alleviate hunger and malnutrition" by "permit[ing] low-income households to obtain a more nutritious diet through normal channels of trade."[1] Today this goal is accomplished through the issuance of monthly benefits in the form of Electronic Benefit Transfer (EBT) cards that can be used in retail food stores. The SNAP benefit is based on the Thrifty Food Plan (TFP), which is intended to provide a minimal-cost, healthy diet based on household size (see Box 2-1) (Carlson et al., 2007a).

Households with very little or no income receive the full TFP amount. Other households receive the TFP amount minus 30 percent of their net income because the SNAP program assumes that each household with income can contribute 30 percent of that income to the purchase of food. To the extent that 30 percent of household income is insufficient to purchase an amount of food equal to the TFP market basket, the SNAP benefit is issued in an amount that, combined with 30 percent of household income, totals the TFP amount for that household size (FNS, 2012b). For example, a household of four people with net income of $1,000 per month is expected to spend $300 per month of its net income for food. Because it needs $612 to purchase the TFP market basket, SNAP issues the household $312 in benefits.[2] Eligibility for benefits is based on a gross income limit of 130 percent of the federal poverty threshold for a given household size, and net income may not exceed 100 percent of that threshold (households

[1]Food and Nutrition Act of 2008, Public Law 110-246, Sec. 2, pp. 1-2.

[2]This example does not incorporate the temporary increase in SNAP benefits under the American Recovery and Reinvestment Act of 2009 (Public Law 111-5).

that contain an elderly or disabled person are exempt from the gross income test). The TFP, basic eligibility rules, and benefit levels are the same throughout the contiguous United States. See Figure 2-1 for a timeline of the dates of key SNAP legislation, as well as changes in participation and average benefit amounts over time.

The Early Program

SNAP was preceded by the original Food Stamp Program of 1939 and the pilot programs of the early 1960s. The 1939 program was initiated to align growing food surpluses with a concern for the needs of the poor as the country emerged from the Great Depression. The program grew out of a commodities distribution program in which commodities were purchased for a nonprofit, noncapital corporation, the Federal Surplus Relief Corporation, whose goal was to encourage domestic consumption of surplus food as a source of unemployment relief. With the new program, people on relief (public assistance) purchased orange stamps for $1 each, up to an amount approximately equal to their normal monthly food expenditure. For every orange stamp they purchased, they received a blue stamp worth 50 cents. The orange stamps could be used to buy any food, while the blue stamps were for foods USDA deemed surplus. The program operated in about half of U.S. counties and served about 4 million people a month at its peak (FNS, 2012c). The Secretary of Agriculture's 1939 annual report[3] included the following description of the program: "In times of great agricultural surpluses, which usually are accompanied by great unemployment, it will be there to do a minimum job in terms of minimum diets below which the public health would be endangered. The broader market made it possible for farmers in times of stress will help to stabilize our whole economy" (p. 719). Not surprisingly, the program was widely popular with the general public, participants, and grocers. By 1943, however, the program was terminated because of reduced availability of surpluses due to the war effort and a decline in unemployment levels (FNS, 2012d).

The Program of the 1960s and the Food Stamp Act of 1964

Nonetheless, the Food Stamp Program was not forgotten, and interest in the program continued until 1960, when it again became a reality. During his presidential campaign in West Virginia, Senator John F. Kennedy promised to start a food stamp program if elected. His first executive order on January 21, 1961 (White House, 1961), expanded food distribution programs and was followed by a February announcement that USDA would

[3]Food Stamp Act, HR 7940, 95th Congress (1977-1978).

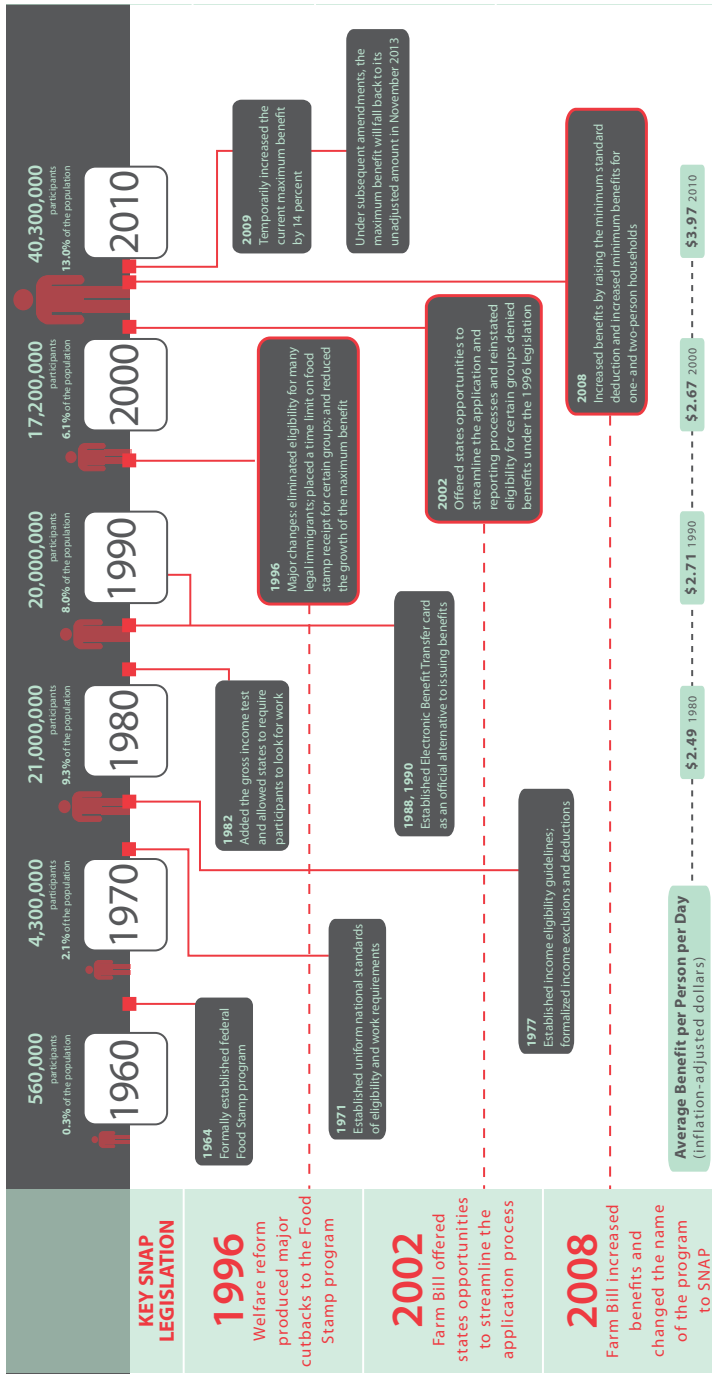

FIGURE 2-1 SNAP timeline.
SOURCE: CBO, 2012.

initiate a series of food stamp pilot programs. Starting with eight sites, the initiative eventually expanded to 43. The success of these pilot programs led President Lyndon Johnson to request in 1964 that a permanent Food Stamp Program be enacted.[4] He signed such a program into law later that year under the auspices of his "War on Poverty" (FNS, 2012d).

The original blue and orange stamps were replaced with food coupons, which participants were still expected to purchase. The so-called purchase requirement was considered essential to ensuring that the food stamp benefit would equal the cost of a healthy diet for the family's size. State welfare agencies would determine eligibility, and households not on public assistance could apply at those offices. Any food for home consumption could be purchased except imported foods (exceptions were made for coffee, tea, and bananas). Alcohol and tobacco purchases were specifically prohibited. Counties were added to the program as they made requests and appropriations allowed. By April 1965, there were more than half a million participants, and by the time of the next major program changes, in February 1971, there were 10 million participants (FNS, 2012c).

The 1970s: National Eligibility Standards, Nationwide Expansion, and Elimination of the Purchase Requirement

Program revisions in 1971 replaced the state-by-state rules with national eligibility standards.[5] In 1974, the Food Stamp Program expanded across the nation. Before the nationwide expansion, many counties operated commodity distribution programs in lieu of the Food Stamp Program, in part because the commodities were intended to cover a family's full food needs for a month with no cash contribution.

The next major changes to the Food Stamp Program resulted from the Food Stamp Act of 1977.[6] The purchase requirement ensured that a family would receive coupons valued at what USDA determined to be the cost of a healthy diet; however, it had a depressing effect on program participation. After heated debate, the purchase requirement was eliminated, and participants were to receive only the formerly free portion of their benefit in coupons; they were expected to continue to buy a healthy diet by supplementing their coupons with cash (the 30 percent of net income rule). Following implementation in 1979, the reforms did indeed result in a greater percentage of eligible households participating in the program; during the month in which the purchase requirement was lifted, participation increased by 1.5 million over the previous month (FNS, 2012c).

[4]Food Stamp Act of 1964, Public Law 88-525.
[5]Amendments to the Food Stamp Act of 1964, Public Law 91-671.
[6]Public Law 88-535.

Many other significant changes were included in the 1977 law, but one change that did not make the final cut was an attempt to limit the types of foods that could be purchased, excluding those with low nutritional value. The bill did require that food stamp funds be given to the Expanded Food and Nutrition Education Program (EFNEP) operated by the USDA Extension Service, to increase its ability to educate food stamp participants in nutrition[7] (see Chapter 4 for further information).

The 1980s Through Today

In the 1980s, legislators expressed concern about the size and cost of the Food Stamp Program, and subsequent legislation, among other things, limited participation by requiring households to meet a gross income test and decreasing the frequency of cost-of-living adjustments for allotments (FNS, 2012c). Legislation in 1988[8] increased the TFP by 3 percent in recognition of the time lag between the cost-of-living adjustments and their implementation over time. Later in that decade, the 3 percent increase was eliminated.[9]

As part of the 1996 Welfare Reform Act,[10] a number of changes were made to the Food Stamp Program, including giving states greater administrative control, eliminating eligibility for legal noncitizen residents[11] (partially restored in the Farm Security and Rural Investment Act of 2002 [Farm Bill][12]), limiting eligibility for able-bodied adults without dependents, and officially adopting the EBT system for benefit delivery (Committee on Ways and Means, 2004). The EBT system went nationwide in 2002. It is designed to reduce fraud in the program and potential stigma resulting from the use of paper coupons (FNS, 2012c).

In April 2009, as part of the American Recovery and Reinvestment Act,[13] a 13.6 percent increase was added to the TFP for most households (about $80 for a family of four) in an effort to help jump-start the economy and in recognition of the economic challenges faced by program participants. This increase in the TFP, which translated into a higher maximum benefit amount, is scheduled to expire on October 31, 2013.

[7]Food Stamp Act of 1977, Public Law 95-113, Stat. 913-1045.

[8]Hunger Prevention Act of 1988, Public Law 100-435, 102 Stat. 1645-1677.

[9]Personal Responsibility and Work Opportunity Reconciliation Act of 1996, Public Law 104-193.

[10]Personal Responsibility and Work Opportunity Reconciliation Act of 1996, Public Law 104-193.

[11]Legal immigrants must live in the country at least 5 years before receiving benefits.

[12]Public Law 107-171.

[13]Public Law 111-5, Title 1, Sec. 101.

SNAP BENEFIT FORMULA AND ELIGIBILITY

Benefit Formula

Participants' monthly benefits, accessed using an EBT card, allow them to purchase food items for use at home, as well as seeds and plants to produce food. Consistent with its original design, SNAP is intended to supplement money a household has available for food purchases as described earlier. The purchasing power of the benefits, however, is affected by changes in food prices over the benefit period, as well as by other costs, such as those for fuel and shelter, and employment and income volatility. The cost-of-living adjustment for the TFP is discussed below. Other adjustments to reflect the cost of living are applied to the shelter deduction, the standard deduction, and the resource limit (FNS, 2012b). Box 2-2 provides a basic overview of the SNAP benefit formula.

The SNAP allotment for a household is determined by the maximum benefit guarantee, the benefit reduction rate, and net income. For purposes

BOX 2-2
SNAP Benefit Formula

Calculation of the SNAP allotment is based on the maximum monthly benefit, which in turn is based on the cost of the Thrifty Food Plan minus 30 percent of the applicant's net income, or as:

$$\text{SNAP allotment} = G - 0.3 \times Y_n,$$

where G is the maximum monthly benefit, which varies by household size but is fixed across the contiguous 48 states and the District of Columbia (higher in Alaska and Hawaii), and Y_n is net income. Net income, Y_n, is calculated by subtracting a number of deductions from gross income, Y_g, which consists of most sources of private income and some transfer income. Specifically, net income is

$$Y_n = Y_g - (0.2 \times \text{earnings}) - \text{child support} - \text{standard deduction} - \text{dependent care deduction} - \text{excess shelter deduction} - (\text{out-of-pocket medical costs} - 35),$$

where earnings refer to labor market income, child support is payments made for children for whom paternity is established, the standard deduction is a deduction received by all households to cover emergency or unusual expenses, dependent care includes child and adult care expenses, the shelter deduction is for persons facing very high housing costs as a fraction of their income, and out-of-pocket medical expenses encompass those costs not reimbursed by private or public insurance for persons aged 60 and older and the disabled.

of the SNAP program, a household is defined as individuals who live together and who generally buy and consume meals together. If the individuals are related by birth, marriage, or adoption, they are counted as part of the household (except that a person aged 60 or older who is incapable of preparing his or her own meals may be treated as a separate household); if the individuals are not related and do not share meals, they can apply separately (FNS, 2012b).

The maximum benefit, for the 48 contiguous states and the District of Columbia for FY 2012, is shown in Table 2-1 (the amounts for Alaska and Hawaii are higher). As was the case in earlier versions of the program, the benefit reduction rate is fixed across the nation at 30 percent under the expectation that households should be responsible for about a third of their monthly food expenses, although with the formal deductions, the rate is effectively reduced to about 15-20 percent (Ziliak, 2008).

As depicted in Box 2-2, several expenses are deducted from household gross income to arrive at net income. SNAP allows 20 percent of labor market earnings to be deducted from gross income to account for work-related expenses such as transportation.[14] Child support payments are deducted. All households receive a standard deduction intended to cover emergency and unusual household expenses; the amount of this deduction varies by household size ($147 in FY 2012 for households comprising one to three people, $155 for households of four or more people). The excess shelter deduction takes effect when households spend 50 percent or more of their income on housing after all other deductions, and is capped at $459 in FY 2012 for the contiguous United States (FNS, 2012b). The standard deduction is set at 8.31 percent of the income eligibility standard for each household size (but not to exceed 8.31 percent for a household of six). It is adjusted each fiscal year to reflect changes for the 12-month period ending the preceding June 30 using the Consumer Price Index (CPI) for All Urban Consumers for items other than food (BLS, 2012).[15] The shelter deduction (see Chapter 5) is adjusted to reflect changes for the fiscal year using the CPI for All Urban Households for the previous 12-month period ending the preceding November 30.[16] These income deductions are discussed further in Chapter 5. The deduction for out-of-pocket medical costs in excess of $35 is allowed only for those aged 60 and older and the disabled.

If net income is zero or negative, the household qualifies for the maximum benefit. At the other extreme, the SNAP allotment can, in theory, be zero, but USDA sets a nominal benefit floor ($16 in FY 2012 for one- to

[14]Food Stamp Act of 1977, Public Law 95-113.
[15]7 C.F.R., Vol. 4, § 273.9 (d)(1).
[16]7 C.F.R., Vol. 4, § 273.9 (d)(6)(ii).

TABLE 2-1 Maximum SNAP Benefits for the 48 Contiguous States and the District of Columbia (October 1, 2011, Through September 30, 2012)

Number of Persons	Monthly Amount ($)
1	200
2	367
3	526
4	668
5	793
6	952
7	1,052
8	1,202
Each additional person	150

SOURCE: FNS, 2012b.

two-person households in the 48 contiguous states and the District of Columbia [FNS, 2012e]).

About 80 percent of all benefits are used within the first 2 weeks of issuance, and more than 91 percent of all benefits are used by the 21st day (FNS, 2012f). This has led some people to suggest that benefits might be issued semimonthly to smooth use over the month (Orszag, 2012; Wilde, 2007). Among the arguments made in favor of such semimonthly delivery of benefits is that evidence suggests the caloric intake of SNAP recipients declines 10 to 15 percent at the end of the month (Shapiro, 2005), and admissions to hospitals for hypoglycemia increase significantly among food insecure diabetics (Seligman et al., 2011). This change, however, could result in increased program administration costs and possibly reduced flexibility for bulk purchases among SNAP beneficiaries. The committee is unaware of any instances in which implementation of benefits more frequently than once monthly has occurred.[17]

Basic Eligibility

Basic eligibility for SNAP requires passing two income tests and two asset tests. The gross income test requires that gross income be less than 130 percent of the federal poverty threshold for the household size, while the net income test requires that net income be less than 100 percent of the poverty threshold (see Table 2-2 for FY 2012 limits). The gross income test is waived for households containing persons aged 60 and older and those receiving certain disability payments, although the net income test still applies. The asset tests are a liquid asset test of $2,000 ($3,250 for persons

[17]See http://www.fns.usda.gov/snap/ebt/issuance-map.htm (accessed October 11, 2012).

TABLE 2-2 SNAP Income Limits for the 48 Contiguous States and the District of Columbia (October 1, 2011, Through September 30, 2012)

Number of Persons	Gross Income Limit ($/month)	Net Income Limit ($/month)
1	1,180	908
2	1,594	1,226
3	2,008	1,545
4	2,422	1,863
5	2,836	2,181
6	3,249	2,500
7	3,633	2,818
8	4,077	3,136
Each additional person	414	319

SOURCE: FNS, 2012b.

aged 60 and older or disabled); such assets include, for example, most forms of cash, checking accounts, savings, stocks, and bonds, and a vehicle value test of $4,650 (FNS, 2012b). The value of the home is excluded from the asset test (FNS, 2012b), as is the earned income tax credit. However, if the earned income tax credit is not spent for more than 12 months, any remaining amount is counted as a resource (some states have shorter windows).[18] The asset limit is adjusted each fiscal year to reflect changes in the CPI for All Urban Households, rounded down to the nearest $250 increment (FNS, 2011). Most states (36) waive the value of all vehicles, and an additional 15 waive the value of the primary vehicle (FNS, 2010).

Categorical Eligibility

Most recipients of Temporary Assistance for Needy Families (TANF), Supplemental Security Income (SSI), and General Assistance are categorically eligible for SNAP and thus not subject to the above income and asset tests (FNS, 2012b). In 2010, some 24 percent of the SNAP caseload was categorically eligible for this reason, compared with 42 percent in 1996. The TANF-only share of the caseload declined from 37 percent in 1996 to 8 percent in 2010, mainly because of the decline in TANF recipients following welfare reform (Eslami et al., 2011).

Under broad-based categorical eligibility, households may become categorically eligible based on the receipt of *noncash* assistance from TANF or state maintenance-of-effort money. The noncash benefits range from receipt of brochures made available in certification offices to actual enrollment in

[18]Tax Relief Unemployment Insurance Reauthorization and Job Creation Act of 2010, Public Law 111-312, Sec. 728.

employment programs. Some 47 states use noncash categorical eligibility for gross income eligibility, and of these, 41 states use the broadest definition (FNS, 2010). These state options have become controversial.

DEFINITION OF THE SNAP ALLOTMENT

The Economy Food Plan and Individual Benefits

The Economy Food Plan, first established in 1961, was used to determine maximum food stamp benefits until 1975, when a U.S. Circuit Court ruled that the plan did not adequately address the needs of individuals of different sexes and ages. The court ruled that "substantially all recipients" should have access to a healthy diet and directed the Secretary of Agriculture to issue regulations that would either individualize allotments or "increase the 'average' allotment so that virtually all recipients are swept within it."[19]

In response to the court's guidance, in January 1976 the Secretary replaced the Economy Food Plan with the TFP at the same cost level, and the Food Stamp Act of 1977 changed the proposal to specifically support that administrative action. Today's statute (1) specifies that the TFP is the basis of the SNAP maximum benefit, (2) defines a reference family's age and sex composition (see next section), and (3) requires annual updates to reflect the cost of the plan. Further, the statute makes clear that the TFP is the basis of the benefit "regardless of [a household's] actual composition."[20]

The Thrifty Food Plan

The TFP is "an assortment of foods that represents as little change from average food consumption of families with relatively low food costs as required to provide a nutritious diet, while controlling for cost."[21] As depicted in Figure 2-2, the TFP provides a market basket for each of 15 age-sex groups. For SNAP purposes, however, the plan bases maximum benefits on the market basket for a household comprising a male and female aged 19-50 and two children aged 6-8 and 9-11. This is called the "reference family," meaning that the TFP maximum benefit is based on this four-person family composition. A 5 percent waste factor is factored in, and economies of scale are applied by household size.

[19] *Rodway v. United States Department of Agriculture*, 514 F.2d 809, 168 (U.S. App. D.C. 387, 1975).

[20] Food and Nutrition Act of 2008, Public Law 110-246, Sec. 4, p. 1-8.

[21] 90th Congress, 1st session, House Agriculture Committee Report no. 95-464, pp. 186-187 (June 1977).

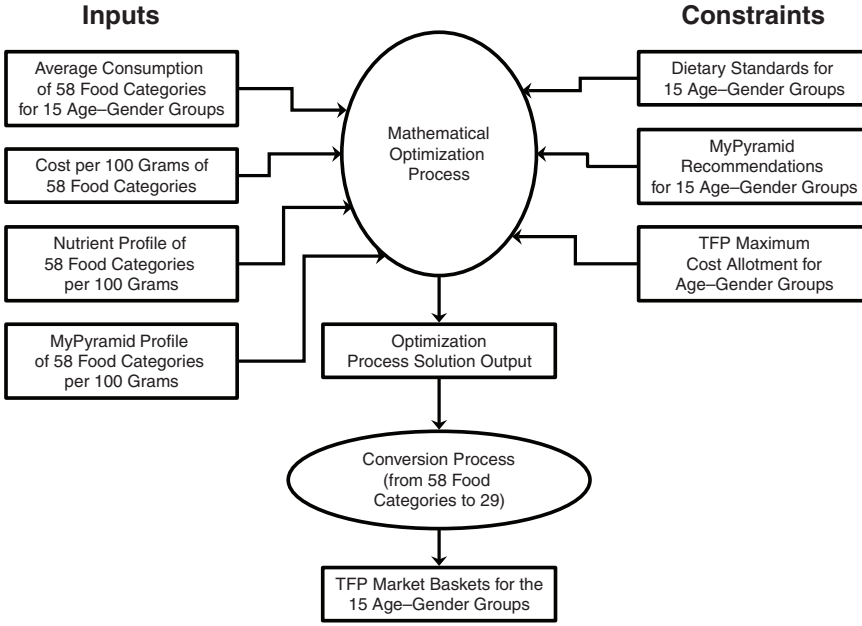

FIGURE 2-2 Thrifty Food Plan methodology.
SOURCE: Carlson et al., 2007a.

Other Food Plans

The TFP is the least costly of four plans developed by USDA to represent market baskets at different cost levels that conform to the most current dietary standards. The other three food plans are the Low-Cost Food Plan, the Moderate-Cost Food Plan, and the Liberal Food Plan. The Low-Cost plan represents food expenditures for the second-from-the-bottom quartile of food spending, the Moderate-Cost plan represents the second-from-the-top quartile, and the Liberal plan represents the top quartile. The plans are typically updated every 5 years, although the last update was in 2006. For a family of four, the monthly cost of the TFP in June 2011 was $612, compared with $796 for the Low-Cost plan, $995 for the Moderate-Cost plan, and $1,208 for the Liberal plan.[22] The Low-Cost plan often is used by bankruptcy courts to allocate the portion of a person's income that is necessary for food expenses. The Liberal plan is used by the Department of Defense to determine the Basic Allowance for Subsistence rates for all

[22]This example does not incorporate the temporary increase in SNAP benefits under the American Recovery and Reinvestment Act of 2009 (Public Law 111-5).

service members. All three of these plans are used to set state child support and foster care payments through USDA's report *Expenditures on Children by Families* (Carlson et al., 2007b).

All plans meet the same caloric level for each age-gender group and are based on the 1997-2006 Dietary Reference Intakes (IOM, 1997, 1998, 2000, 2001, 2005a,b), the 2005 *Dietary Guidelines for Americans* (DGA) (HHS and USDA, 2005), and the 2005 MyPyramid food intake recommendations (USDA, 2005). All plans also are capped at their original levels but adjusted for inflation each year. A waste factor of 5, 10, 20, and 30 percent is calculated for the TFP and the Low-Cost, Moderate-Cost, and Liberal plans, respectively. All plans are for food consumed at home.

Cost-of-Living Adjustments

The TFP is updated monthly, but the SNAP maximum benefit is updated only annually (see Chapter 5). These updates are based on the CPI for the 29 food categories in the TFP that have a corresponding CPI or set of CPIs for each age-sex group (Carlson et al., 2007a). The maximum benefit is updated in October of each year using the previous June's TFP cost, thereby resulting in a lag of 4 to 16 months. Between June and October 2008, for example, the cost of the TFP rose from $588 to $606, a 3.1 percent increase, for a family of four (Hanson and Andrews, 2008). An Economic Research Service (2008) report suggests two alternative adjustment methods: using 103 percent of the TFP or semiannual adjustments. A 3 percent increase in the maximum benefit in October would still result in a lag in benefits for some months, but over the course of FY 2008, for example, the benefit reduction per household would have been equivalent to $12.40 rather than $22.00 per month. The semiannual adjustment would have reduced the per household average monthly benefit reduction equivalent from $22.00 to $16.20 per month. Both methods have been used in the past only to be terminated when program cost savings were needed.

As described in Chapter 4 (Figure 4-3), the CPI for food has lagged behind the TFP cost index. This index is calculated by USDA's Center for Nutrition Policy and Promotion (CNPP) using price data provided by the Bureau of Labor Statistics. As a result of this lag, participants' food purchasing power may decline further to the extent that adjustments fail to account fully for the rise in the cost of the TFP.

Thrifty Food Plan: Dietary and Consumption Considerations

To determine the market baskets, the most recent TFP uses (1) the 1997-2005 Recommended Dietary Allowances, Adequate Intakes, and Acceptable Macronutrient Distribution Ranges (IOM, 1997, 1998, 2000, 2001,

2005a,b); (2) the recommendations of the 2005 DGA (HHS and USDA, 2005); and (3) the 2005 MyPyramid food intake patterns (USDA, 2005).

The DGA are federal nutrition policy and as such are the basis of nutrition guidance for all federal food assistance programs, including WIC, the School Meals programs, and CACFP. Although participants' use of SNAP benefits is not directly tied to the DGA, the guidelines serve as the basis for educational programs for participants—SNAP-Ed and EFNEP. USDA-FNS views these educational programs as shared targeting that reinforces and builds on important nutrition messages across programs using multiple sources.[23] Appendix G provides a list of the 2010 DGA.

The TFP uses 58 different food groups in quantities as similar as possible to the current consumption pattern of low-income households using data from the 2001-2002 National Health and Nutrition Examination Survey (NHANES) for the reference family. USDA notes that while there is deviation from these reported purchasing patterns, the market basket for this family contains more pounds of food than the average family reports eating (Carlson et al., 2007b). Pricing is based on the 2005 A.C. Nielsen Homescan Panel (NCP, 2012).

Thrifty Food Plan: Cost Considerations

Updated TFPs should cost no more than the previous plan adjusted for inflation; in other words, the cost level of the TFP should remain constant. In its TFP publication, CNPP states that "because 2001-2002 consumption data underlie the 2006 revision of the TFP market baskets CNPP limited the cost of each group's revised TFP market basket to equal the average real costs of its previous TFP market basket for the 2001-2002 period. This constant real-cost constraint was used to examine whether and how a person could achieve a nutritious diet based on current dietary needs" (Carlson et al., 2007a, p. 18). CNPP states further that it was able to meet the cost constraint. However, the committee found that the expectations of program participants imposed by this approach were not always realistic given constraints on access to low-priced foods, the lack of cooking skills for the "from-scratch" preparation often assumed in the TFP, the lack of variety in meals using the ingredients assumed in the plan, and other considerations.

Audits by the Office of the Inspector General

A report issued by USDA's Office of the Inspector General found the TFP methodology to be sound. However, the following caveat was cited:

[23]See http://www.nal.usda.gov/fsn/Guidance/FY2013SNAP-EdPlanGuidance.pdf (accessed October 11, 2012).

"While noting the lack of a statistical basis for the food pricing data obtained through the A.C. Nielsen Homescan Reporting Service, we were unable to identify any better source for use in developing a food price database" (OIG, 2009).

Home Consumption Limitation

SNAP has always limited food purchases to food consumed at home, with the exception of accommodations for some elderly and disabled persons, the homeless, and some treatment centers. The program also limits prepared foods such that hot food may not be purchased with SNAP benefits (see the discussion of eligible foods later in this chapter).

A 2006 report of the Economic Research Service used the 2002 Consumer Expenditure Survey to estimate that low-income households spent 125 percent of the calculated cost of the TFP if food consumed both at home and away from home was considered (Blisard and Stewart, 2006). If food consumed away from home was not considered, however, low-income households spent about 86 percent of the level suggested by the TFP for food consumed at home. Using NHANES data for 2001 and 2002, USDA estimated that the TFP would need to be increased by 7 percent if just one meal a week per person were eaten away from home (Lin and Carlson, 2010). Lin and Carlson note further that "allowing for SNAP benefits to be spent on food away from home, which is generally nutritionally inferior to food at home, may help SNAP participants balance time constraints and other needs, but could also make eating healthy even more challenging" (p. 1).

Thrifty Food Plan: Economies of Scale

As noted above, the TFP is designed for a reference family of two adults and two children, and the cost is then adjusted for families of different sizes. The adjustment factors reflect economies of scale in food purchases since larger packages usually have lower costs per unit. Under typical circumstances, for example, a large family may be able to consume a gallon of milk before it spoils, but a small family may be able to consume only a quart of milk. If milk prices are lower per ounce in larger containers, the cost per person of milk consumption is lower for the large family. To account for these economies of scale, the per-person benefit for a family of four is increased by 5 percent for a family of three, by 10 percent for a family of two, and by 20 percent for a family of one. Conversely, per-person benefits are reduced by 5 percent for families with five or six members and by 10 percent for those with seven or more members.

Foods Eligible for Purchase with Benefits

The Food Stamp Act of 1964

According to the Food Stamp Act of 1964,[24] eligible foods included any foods for human consumption except alcoholic beverages, tobacco, and foods identified on the package as imported meat and meat products. The House Agriculture Committee tried at the time to prohibit soft drinks, luxury foods, and luxury frozen foods, but the Senate Agriculture Committee declined, saying that the restriction would cause "insurmountable administrative problems."[25] The basic definition in the 1964 act remained essentially unchanged until 1977 with some exceptions, including the additions outlined below.

In 1970, the elderly homebound and disabled were allowed to use coupons for meals prepared and delivered to them by private nonprofit organizations or political subdivisions as long as the provider received no federal financial assistance. Meals On Wheels was specifically cited as eligible to accept coupons donated by these households on a voluntary basis. In 1973, the Agriculture and Consumer Protection Act[26] eliminated the imported foods limitation; added plants and seeds as eligible foods; and allowed food coupons to be accepted by communal dining facilities for the disabled and elderly, as well as addiction treatment programs. An attempt at that time to ban non-nutritious foods was defeated on the House floor.[27]

The Food Stamp Act of 1977

In the debate on the 1977 Food Stamp Act, the House Agriculture Committee considered the issue of "junk foods." There was an effort to define such foods as those "which the Secretary, after consultation not less than once annually with the President of the National Research Council of the NAS (Food and Nutrition Board) determines to have such negligible or low nutritional value or insignificant enhancement of palatability as to be inappropriate for inclusion in a healthy diet."[28] This amendment failed even though it included another provision that had passed that would have

[24]Public Law 88-525, Sec. 3.

[25]90th Congress, 1st session, House Agriculture Committee Report No. 95-464, p. 321 (June 1977).

[26]Public Law 93-86.

[27]90th Congress, 1st session, House Agriculture Committee Report No. 95-464, p. 323 (June 1977).

[28]90th Congress, 1st session, House Agriculture Committee Report No. 95-464, p. 333 (June 1977).

excluded ice cubes, artificial food coloring, powdered and liquid cocktail mixes, chewing gum, carbonated drinks, and cooking wines.[29]

The amendment's defeat was attributed to concern about the difficulty it would cause the Secretary, the administrative burden on retailers, and the uncertain state of nutrition science. It was also recognized that eliminating the provision that such items could not be obtained with benefits meant households could purchase the items anyway within their food budgets. When program participants were required to pay for a portion of their food benefit, their cash and the benefit were returned to them in the form of coupons that could be used only to purchase foods. When households no longer had to turn their cash contribution into coupons, only the federal benefit portion continued to be received as coupons, and households could use their cash for any food or nonfood purchases. Even though hot foods ready for immediate consumption were never permitted, the House committee did officially ban such foods except in communal dining situations and in restaurants used by the elderly. "If the fast food stores cannot redeem food stamps, the Committee thought that grocery stores should not be permitted an unfair advantage."[30] The ban on hot foods was included in the 1977 law and remains in the current law. The issue of competition among outlets that sold hot foods arose when USDA disallowed Kentucky Fried Chicken™ from becoming a food stamp–approved retailer. The company sued and won in District Court, but on October 7, 1971, the Fifth Circuit Court of Appeals upheld USDA's right to deny fast food establishments' authorization to accept benefits.[31]

Current Law

The current law defines eligible foods as "(1) any food or food product for home consumption except alcoholic beverages, tobacco, and hot foods or hot food products ready for immediate consumption . . . , [and] (2) seeds and plants for use in gardens to produce food for the personal consumption of the eligible household."[32]

Recently, the State of New York requested a waiver from the law to undertake a demonstration project restricting the purchase of sugar-sweetened beverages in New York City. The stated goal was to reduce obesity. USDA denied the request on August 19, 2011. The letter of denial raised the following concerns: New York City was too large a site for such

[29]90th Congress, 1st session, House Agriculture Committee No. 95-464, p. 333 (June 1977).
[30]90th Congress, 1st session, House Agriculture Committee No. 95-464, p. 333 (June 1977).
[31]Kentucky Fried Chicken of Cleveland, Inc., Plaintiff-Appellee, v. United States of America, 449 F.2d 255, No. 71-1960, U.S. appellate (1971).
[32]Food and Nutrition Act of 2008, Public Law 110-246, Sec. 3, pp. 1-4.

a complex proposal; retailers would face difficult operational issues; the proposal failed to address point-of-sale problems, which could cause confusion and stigma for clients and retailers; and the evaluation component of the project was inadequate (USDA, 2011).

USDA's Food and Nutrition Service (FNS) further commented on its preference for incentive-based approaches and cited a project it is carrying out with Massachusetts that increases allotments when fruits and vegetables are purchased with SNAP benefits (USDA, 2011). FNS elaborates further on its views on its website.[33] The Massachusetts pilot is the result of $20 million provided by the Food, Conservation, and Energy Act of 2008[34] for study of the impact of an incentive-based point-of-sale project focused on increasing the purchase of fruits and vegetables. The life of the project—Healthy Incentives Pilot—extended from November 2011 through December 2012. The pilot was located in one county and provided a credit worth 30 percent of the purchase price of targeted fruits and vegetables bought with SNAP benefits. There was a $60 monthly cap per household. Fruits and vegetables could be fresh, frozen, canned, or dried (MA DTA, 2011).

TRENDS IN PROGRAM PARTICIPATION AND COSTS

The committee's review of the evidence revealed a number of descriptive trends in program participation, costs, and caseload composition. Figure 2-3 depicts trends in SNAP participation and total costs from 1969 to 2011. Participation is presented in millions of persons on the left axis and as a percentage of the population on the right axis. Program participation increased rapidly with the rollout in the 1970s, and trends remained fairly stable through the 1980s, although there were clear increases and declines in participation over the business cycle as the program functions as an automatic fiscal stabilizer. The last two decades have seen much greater variability in participation. Substantial increases in the early 1990s were followed by a decline of more than one-third between 1994 and 2000 in response to changes in the business cycle (Ziliak et al., 2003) and welfare policy reform (Kabbani and Wilde, 2003; Ratcliffe et al., 2008). Since then, in response to the recessions of 2001 and 2007, along with expanded outreach efforts as part of the 2002 and 2008 Farm Bills (Klerman and Danielson, 2011; Mabli and Ferrerosa, 2010), average annual participation has increased 160 percent to more than 46 million in FY 2012, or one in seven Americans.

Mabli and colleagues (2011) examined the duration of SNAP participation by individuals from 2002 to 2004. They looked at individuals rather than households because the composition of a given household fre-

[33]See http://www.usda.fns.gov.
[34]Public Law 110-234.

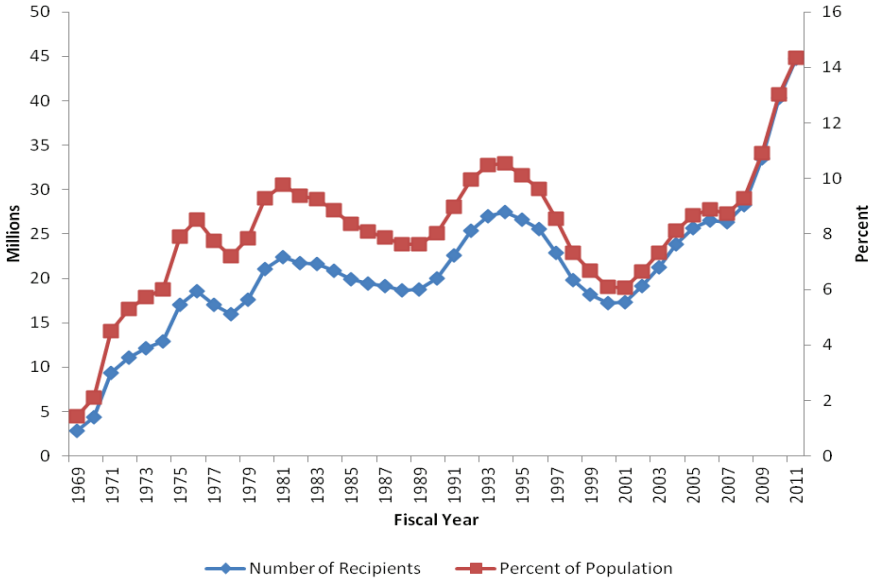

FIGURE 2-3 Trends in the number and fraction of the population receiving SNAP benefits, 1969-2011.
SOURCES: FNS, 2012a; U.S. Census Bureau, 2012.

quently changes over time. Weighted data from the 2004 cohort showed that the median duration of participation for individuals enrolled in SNAP was about 10 months. About 25 percent of participants that left the program, however, returned within 6 months, and 50 percent returned within 20 months.

Given the dramatic changes in participation in recent years, an obvious question is whether particular population subgroups (e.g., children, adults) led the trends. Table 2-3 presents changes in the age composition of the SNAP program in recent years. In a typical year over the past decade, about one-half of SNAP participants consisted of school-age children and just over 40 percent nonelderly adults; these proportions changed little even during the previous recession (Eslami et al., 2011) (elderly adults are defined as aged 60 and over for SNAP purposes).

As shown in Table 2-4, there has been a near doubling of the fraction of SNAP households receiving the maximum monthly benefit over the past decade, and takeup rates increased from 64 percent of eligible participants in 1997 to 72 percent in 2009. Eligible participants that are entitled to higher benefits are more likely to participate. In 2009, while only 72 percent of eligible households participated in the program, the participating

TABLE 2-3 Distribution of SNAP Participants by Age Category Over Time

	Number of Participants in Thousands (% of caseload)			
Fiscal Year	Preschool	School Age	Nonelderly Adults	Elderly Adults
1997	4,046 (17.5)	7,825 (33.8)	9,385 (40.6)	1,834 (7.9)
2000	2,846 (16.7)	5,919 (34.6)	6,623 (38.7)	1,702 (10.0)
2003	3,541 (16.9)	7,087 (33.9)	8,514 (40.7)	1,788 (8.5)
2006	4,243 (16.6)	8,361 (32.7)	10,763 (42.1)	2,229 (8.7)
2009	6,317 (15.9)	12,199 (30.7)	18,121 (45.6)	3,121 (7.9)

NOTE: FY = fiscal year.
SOURCES: FNS, 1999, 2001, 2004, 2007, 2011.

TABLE 2-4 Distribution of Participants by Benefit Amount, Household Size, and Takeup Rate Over Time

Household Characteristic	FY 1997	FY 2000	FY 2003	FY 2006	FY 2009
Percent of SNAP households receiving maximum benefit	22.7	20.2	25.9	32.1	37.4
Mean household size	2.4	2.3	2.3	2.3	2.2
Percent of SNAP-eligible population receiving any benefit	64.0	56.7	56.4	68.9	72.2
Dollar value of average benefit per person per meal[a]	0.78	0.80	0.92	1.03	1.37
Fraction of households with earnings	24.2	27.2	28.2	29.7	29.4

NOTE: FY = fiscal year.
[a]Calculated as average monthly benefit (based on aggregate program participation data) per person, divided by 91.5 meals/month.
SOURCES: Cody and Castner, 1999; Cunnyngham, 2001; Cunnyngham and Brown, 2004; Leftin et al., 2011; Wolkwitz, 2007.

households received 91 percent of the total benefits, in dollar terms, of the amount that would have been spent if the takeup rate were 100 percent (Leftin et al., 2011).

Program costs for SNAP are almost entirely in the form of benefits and are covered by the federal government, the exception being for a small portion of administrative expenses paid for by state governments. Figure 2-4 demonstrates that program outlays have increased in lockstep with participation and that the growth in inflation-adjusted spending differs little from

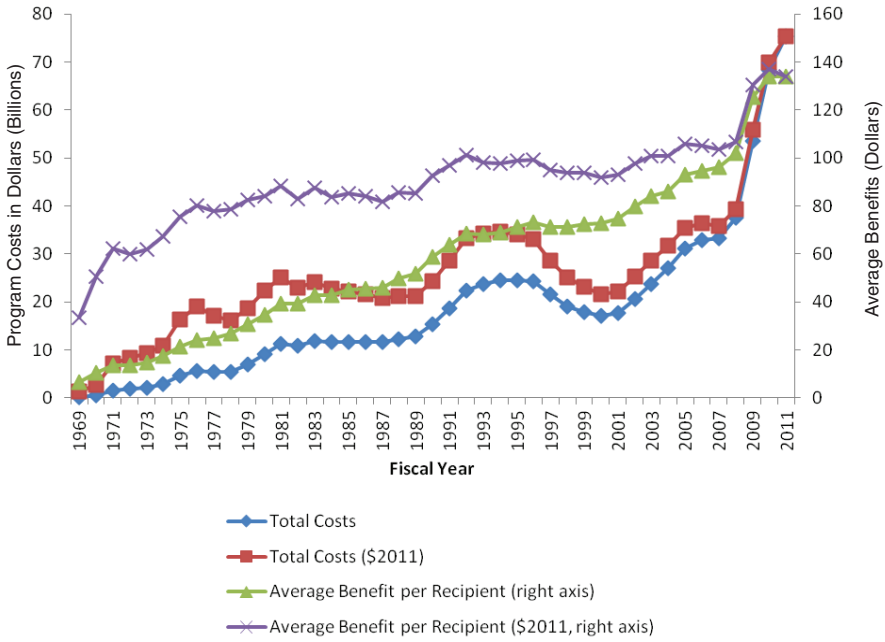

FIGURE 2-4 Trends in nominal and real SNAP expenditures, 1969-2011.
SOURCES: FNS, 2012a; GPO, 2012.

nominal growth.[35] In the last decade, nominal spending (fixed value or price) rose 342 percent, while real spending (change in value or price over time) increased almost 250 percent, such that by FY 2011, program costs were in excess of $75 billion, making SNAP one of the largest programs in the social safety net. Although total costs have grown rapidly, inflation-adjusted per-recipient benefits changed little over the past three decades until the increases under the ARRA were instituted.[36]

TRENDS IN FOOD INSECURITY AND POVERTY

A central goal of SNAP is to alleviate hunger and malnutrition by increasing resources for the purchase of food for a nutritious diet. In 1995, USDA began monitoring food security (see Box 2-3) by means of the annual Food Security Supplement to the monthly Current Population Survey (CPS),

[35]Inflation is measured using the chain-weighted personal consumption expenditure deflator with 2011 base year.
[36]Public Law 111-5.

BOX 2-3
Food Insecurity

Food security is access at all times to enough food for an active healthy life. Food insecurity exists when there is inadequate or unsure access to enough food for active, healthy living. In 1995, the U.S. Department of Agriculture (USDA) began collecting data on food access, food adequacy, spending on food, and sources of food assistance for the U.S. population. Data are collected annually through a food security survey conducted by the U.S. Census Bureau, and are used as a source of information on the prevalence and severity of food insecurity in U.S. households. In the 18-item Core Food Security Module (CFSM), households are placed in one of four mutually exclusive groups: high food security, marginal food security, low food security, and very low food security. Most analyses refer to food insecurity, which combines the latter two categories.

Categories of Food Insecurity

USDA Classification	Number of Affirmative Responses to the CFSM
High food security	0
Marginal food security	1 or 2
Low food security	3-5
Very low food security	8 or more in households with children; 6 or more in households without children

SOURCES: http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us.aspx (accessed April 8, 2013); Anderson, 1990; NRC, 2006.

a nationally representative survey carried out by the U.S. Census Bureau.[37] In December of each year since 2001, about 50,000 households have responded to a series of 18 questions (10 if no children are present) that make up the Core Food Security Module (CFSM) in the CPS (see Appendix F for the list of questions). Each question is designed to capture some aspect of food insecurity, and some questions include the frequency with which that aspect manifests. Respondents are asked about their food security status in the last 30 days, as well as over the past 12 months, and about food spending and the use of federal and community food assistance programs. The 18-item food security scale is intended to capture self-assessed concerns/anxiety over lack of access to healthy and safe foods owing to a lack of economic resources. It is measured at the household level and thus does not identify who in the household is experiencing food insecurity.

[37]For discussion of the history of food insecurity measures, see NRC (2006).

A report from the National Research Council (NRC) of the National Academy of Sciences reviews the concepts and methodology for measuring food insecurity and hunger. It recommends that USDA no longer refer to the more severe forms of food insecurity as "hunger" since hunger is a physiological condition experienced at the individual level and not necessarily at the household level (NRC, 2006). In line with this recommendation, USDA has classified the most severe form of food insecurity as "very low food secure," which it identifies if a household answers affirmatively to six or more (eight or more if children are present) questions on the CFSM. The NRC (2006) report includes the recommendation that USDA continue to measure and monitor food insecurity regularly in a household survey. It recommends further that, given that hunger is a separate concept from food insecurity, USDA undertake a program to measure hunger, which is an important potential consequence of food insecurity. The report also concludes that exclusive reliance on trends in the prevalence of food insecurity would not be an appropriate measure of the effectiveness of food assistance programs such as SNAP. For program evaluation purposes, it is important to know what effect SNAP has on food insecurity. As discussed here and in Chapter 2, however, a challenge facing evaluation of the impact of SNAP on food insecurity is the prospect of reverse causality; that is, food insecure households may self-select into SNAP. Several authors have used sophisticated econometric techniques to model the self-selection process and, after controlling for nonrandom selection, generally have found that SNAP reduces food insecurity (Gundersen and Oliveira, 2001; Kreider et al., 2012).

Figure 2-5 shows trends in 12-month prevalence rates of food insecurity and very low food security among U.S. households from 1995 through 2011. Prevalence rates for 1996 and 1997 were adjusted for the estimated effects of differences in data collection screening protocols used in those years. The supplements were conducted in various months in the initial years but since 2001 have been fielded in December, which implies that the 12-month recall refers to the actual year of the survey. The fraction of households experiencing food insecurity or very low food security held fairly steady until the Great Recession that began at the end of 2007. Thereafter, food insecurity increased by 31 percent and very low food security by 32 percent, although both indicators fell slightly between 2009 and 2011 as the economic recovery began to gain traction.

These trends in food insecurity must be interpreted in the context of other factors that may impact access to food for low-income households, including changes in income distribution across the low-income range, noncash assistance (e.g., participation in other assistance programs), and other basic household needs (Nord, 2007). Indeed, an apparent contradiction in Figure 2-5 is that as SNAP participation and expenditures accelerated in the latter half of the past decade, food insecurity accelerated as well. In

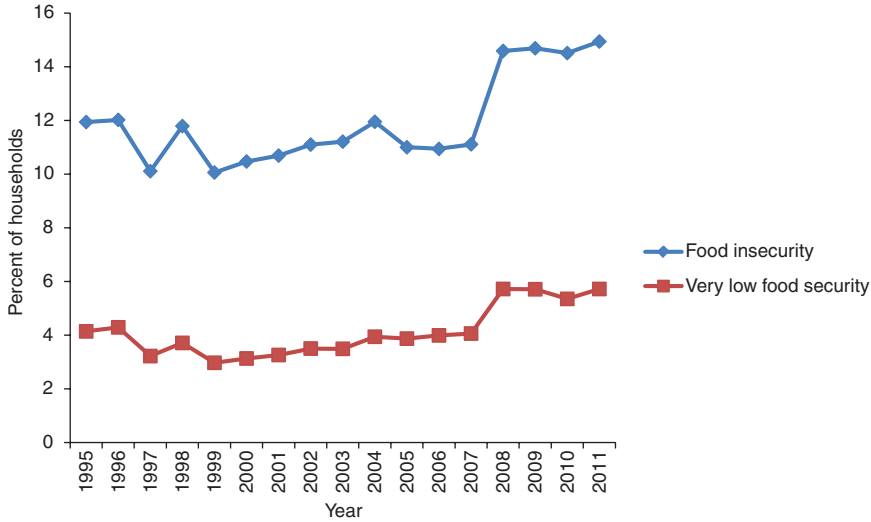

FIGURE 2-5 Trends in prevalence rates of food insecurity and very low food security in U.S. households, 1995-2011.
NOTE: Prevalence rates for 1996-1997 were adjusted for the estimated effects of differences in data collection and screening protocols used in those years.
SOURCE: ERS, 2012. Calculation by ERS based on Current Population Survey Food Security Supplement data.

fact, SNAP recipients are twice as likely as SNAP-eligible nonrecipients to report being food insecure (Tiehen et al., 2012). (A similar contradiction is seen in Figure 2-6, presented later in this section.)

Because participation in SNAP is not likely to be unrelated to food security status, a selection problem arises in evaluating the effect of the program on food insecurity (Currie, 2003). Studies evaluating nonrandom selection by nonexperimental statistical methods (e.g., Gundersen and Oliveira, 2001; Kreider et al., 2012; Mykerezi and Mills, 2010; Yen et al., 2008) generally have found that SNAP reduces food insecurity.

A broader metric of the effect of SNAP on the well-being of individuals and households is the antipoverty effectiveness of the program. While the provision of food assistance has a modest effect on household work effort (Hoynes and Schanzenbach, 2011), it increases household resources for the purchase of food and thus should reduce the incidence and severity of poverty by freeing up income for the purchase of other goods and services (Tiehen et al., 2012; Ziliak, 2011). Ziliak (2011) used data from the Annual Social and Economic Supplement of the CPS to estimate the number of persons lifted out of poverty by SNAP in any given year from 1999 to 2009. Figure 2-6 shows that the antipoverty effectiveness of SNAP increased over the decade, with

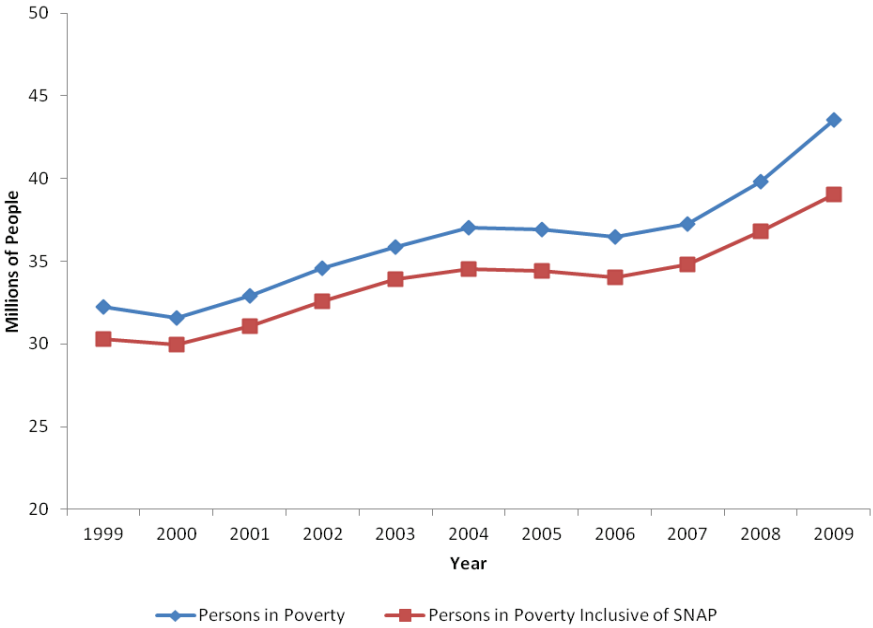

FIGURE 2-6 Trends in number of persons in poverty, exclusive and inclusive of SNAP benefits, 1999-2009.
SOURCE: Ziliak, 2011.

about 2 million people being lifted out of poverty each year through 2003, rapidly increasing to 4.5 million in 2009, most likely because of expanded generosity of benefits in response to the recession. Using the same CPS data as Ziliak (2011), Tiehen and colleagues (2012) found that SNAP participation had an even larger impact on reducing the depth and severity of poverty. Their estimates showed that SNAP benefits led to an average annual decline of 4.4 percent in the incidence of poverty from 2000 to 2009, while the depth and severity of poverty declined 10.3 and 13.2 percent, respectively.[38]

SUMMARY

Although the basic design of SNAP (with the exception of national eligibility standards and elimination of the purchase requirement) has remained

[38]The incidence of poverty refers to the percentage of the population below the poverty line, while depth and severity refer to how far below the line a given poor person's income is. The latter measures differ in the weight given to families farther below the poverty line, with the severity measure giving more weight than the depth measure to the poorest poor.

unchanged since the 1964 law was enacted, the program has undergone many substantial changes that have resulted in its expansion and retraction over the years. These changes often have brought new complexities to program administrators and applicants. The legislation governing today's program has specific eligibility requirements and administrative procedures that make SNAP more complex than other social programs. Even as many features of the program limit its ability to be responsive to an individual household's needs, many other features, such as income deductions, are designed to make it more responsive. Striking a balance between a more targeted and a more accessible benefit has been an ongoing tension in the program. The size and the cost of the program make it a target for budget cuts, and even relatively small adjustments have the potential to impact a significant number of Americans.

Over the years, debates have continued about whether the program should be more of a nutrition or an income maintenance program (including whether the in-kind benefit should be replaced by a cash allotment); to what extent, if any, the program should limit food choices; what responsibilities participants should be expected to have (e.g., whether they, as is now the case, should be required to seek employment if able-bodied); whether geographic distinctions should be applied in determining need and/or benefit levels; and what the program's role should be in providing nutrition education and reaching out to eligible nonparticipants. Other debates have centered on the adequacy of the TFP, whether expecting households to devote 30 percent of their net income to the purchase of food is realistic, and how net income should be defined. For example, households are expected to pay up to 50 percent of their net income for shelter with no commensurate reduction in the amount of their remaining income that should be considered available for food purchases—they are still expected to spend 30 percent of their net income for food. These and other issues have continued to be debated since the inception of the permanent program in 1964 and are discussed in further detail in the ensuing chapters of this report.

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3

Food Security and Access to a Healthy Diet in Low-Income Populations

To set the stage for its examination of evidence to support the feasibility of defining the adequacy of Supplemental Nutrition Assistance Program (SNAP) allotments, the committee first reviewed evidence on relationships between participation in SNAP and the potential for participants to reach the goals of improved food security and access to a healthy diet. This evidence on program outcomes underpins the committee's examination of individual, household, environmental, and program-related factors that serve as components of a science-driven definition of the adequacy of SNAP allotments. The chapter first examines trends in food production, availability, and consumption at the population level. Although food availability data do not account for spoilage and other losses and do not provide a direct measure of consumption, they do serve as an indicator of food consumption trends over time. Next, the chapter examines food purchasing patterns and dietary intake among low-income households and SNAP participants. The chapter then describes evidence on access to a healthy diet and food insecurity among low-income SNAP-eligible as well as SNAP-participating households, including evidence on the impact of SNAP benefits. Next is a discussion of the data and analytical challenges faced in assessing the adequacy of SNAP allotments. The final section presents a summary of findings and conclusions.

FOOD PRODUCTION, AVAILABILITY, AND CONSUMPTION AT THE POPULATION LEVEL

Changes in food production over the course of the last century have led to an increase in total calories available per capita, as well as a change in

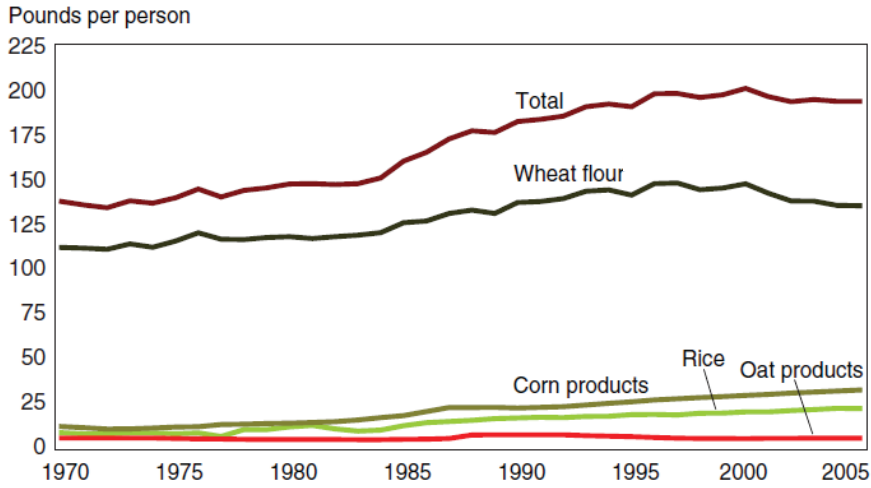

FIGURE 3-1 Per capita total grain availability, 1970-2005.
NOTE: Data for 2005 based on a 2,000-calorie diet.
SOURCE: Wells and Buzby, 2008. USDA, ERS Food Availability (per capita) Data System.

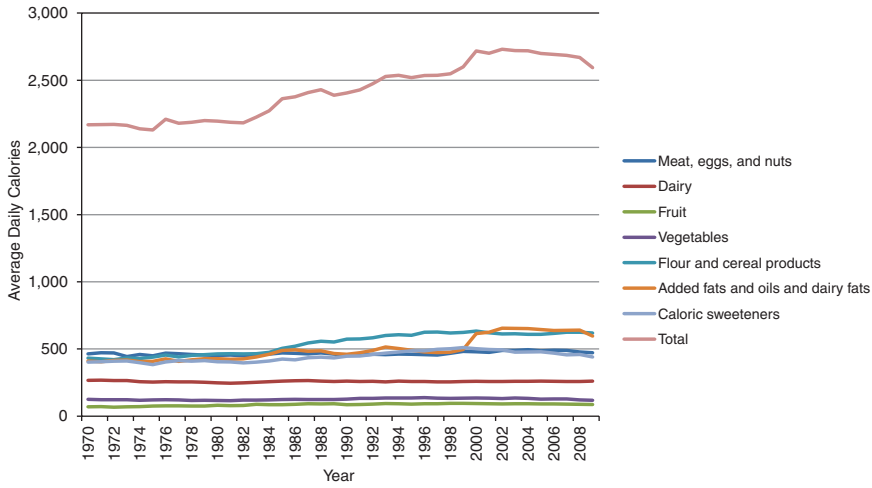

FIGURE 3-2 Increase in average daily per capita energy (calorie) availability in the United States between 1970 and 2009.
SOURCE: Data from ERS, 2012. ERS Food Availability (per capita) Data System, adjusted for spoilage and other waste.

the composition of foods available. In particular, over the past four decades, production and availability have increased for grains more than for other types of foods. Grains of all types—including wheat, corn, rice, and oats—have become more readily available in the food supply. Total grain availability per person increased from 137 pounds in 1970 to 192 pounds in 2005 (Wells and Buzby, 2008; see Figure 3-1).

According to a 2008 U.S. Department of Agriculture (USDA) report on the major trends in food availability,[1] not only did the availability of grains increase by 41 percent from 1970 to 2005, but the availability of all major food groups increased as well—fruits and vegetables (by 19 percent); meat, eggs, and nuts (8 percent); and milk/dairy products (6 percent). In addition, availability increased for fats and oils (62 percent) and added sugars and sweeteners (19 percent) (Wells and Buzby, 2008). As a result of increased production of grains and other foods, per capita total energy availability has risen substantially during the last 30 years—from 2,169 to 2,594 calories between 1970 and 2009 (Figure 3-2), with the largest proportion of the increase coming from fats and processed grain products (ERS, 2012). On the other hand, per capita availability of vegetables, fruits, and dairy products currently is less than 70 percent of the recommended amounts (Figure 3-3).

These aggregate production numbers may simply reflect Americans' consumption preferences and choices. If so, then if the U.S. population were to make healthier choices, that change might be reflected in the aggregate production numbers. Alternatively, people may eat what is available. In this case, if the overall availability of different types of foods is inconsistent with current dietary recommendations—as the evidence suggests—individuals are unlikely to be able to meet the recommendations.

FOOD PURCHASING PATTERNS AND DIETARY INTAKE AMONG LOW-INCOME HOUSEHOLDS AND SNAP PARTICIPANTS

Food Purchasing Patterns

As discussed in Chapter 1, dietary intake is complex and multidimensional and includes food preferences, cultural appropriateness, preparation methods, meal patterns, and individual health needs, among other components. The following section reviews evidence on overall expenditures on food, the marginal propensity to consume food, where SNAP

[1]Food availability is defined as the total amount of food available for consumption and is calculated as the sum of annual production, beginning stocks, and imports minus exports, ending stocks, and nonfood uses.

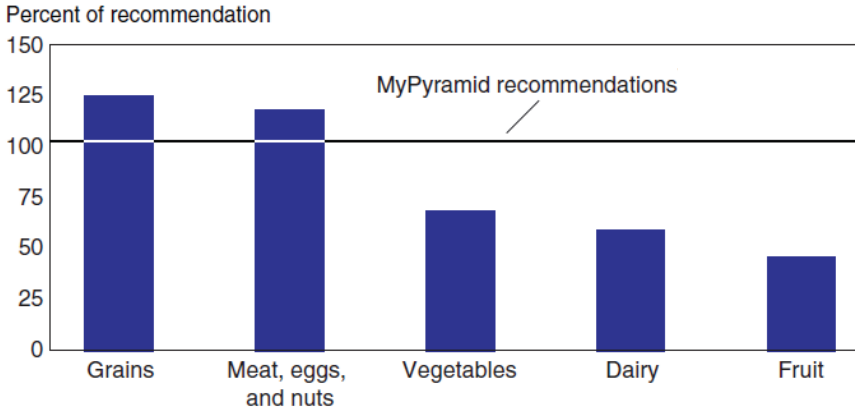

FIGURE 3-3 Loss-adjusted per capita food availability compared with dietary recommendations.
NOTE: Data for 2005 based on a 2,000-calorie diet.
SOURCE: Wells and Buzby, 2008. USDA, ERS Food Availability (Per Capita) Data System.

participants purchase food, and the types of food purchased by low-income and SNAP populations.

Overall Expenditures

The origin of the federal poverty measure is Statistical Policy Directive No. 14, developed in 1968 and revised in 1969 and 1981 (OMB, 2012). As discussed in Chapter 2, the basis of the poverty measure is USDA's economy food plan, which was derived from a 1955 Survey of Food Consumption. This survey found that the average American household spent about one-third (30 percent) of its income on food (U.S. Census Bureau, 1982). The 30 percent figure, however, has been criticized as no longer being relevant to expenditure patterns among U.S. households; the implication for SNAP participants is that they cannot supplement their benefit with the income amount assumed by this figure.

Castner and Mabli (2010) used data from the 2005 Consumer Expenditure Survey to examine the allocation of resources (including SNAP benefits) for household expenditures (including food) across various consumption categories for SNAP, SNAP-eligible but not participating, and SNAP-ineligible groups. They found that SNAP households allocate about 22 percent of their total household expenditures for food consumed at home, compared with 18 percent for SNAP-eligible but not participating households. SNAP households use a greater proportion of their total

expenditures as well as a greater total amount, $4,013 annually, for food, compared with SNAP-eligible nonparticipants, who spend about $3,443 annually for food. Although SNAP-ineligible households spend the most on food, $4,709, that amount represents a smaller percentage of their income than is the case for either SNAP or SNAP-eligible but not participating households. These findings, along with other recent evidence (Frazao et al., 2007; Schnepf and Richardson, 2009), are generally consistent with Engel's Law, which states that as a household's income rises, the amount of that income spent on food also rises, but the proportion of income spent on food declines.

As with general food spending, SNAP participants spend more than eligible nonparticipants on food consumed at home. Specifically, SNAP participants spend 24 percent more than eligible nonparticipants but 5 percent less than ineligible nonparticipants on food consumed at home. By contrast, SNAP participants spend significantly less than eligible and noneligible nonparticipants on food consumed away from home. In terms of actual dollars spent, the 2005 Consumer Expenditure Survey showed that an individual SNAP participant spent about $445 per year on food consumed away from home, compared with $560 for eligible nonparticipants and $945 for noneligible nonparticipants (Castner and Mabli, 2010).

Marginal Propensity to Consume

The marginal propensity to consume is defined as the amount by which expenditures on goods and services in a budget category will increase in response to an increase in income of $1.00. A different but related measure is the marginal propensity to consume food with SNAP benefits, which reflects the change in food expenditures that results from a $1.00 increase in these benefits (Castner and Mabli, 2010). The increase in food spending that accompanies an increase in income is not necessarily the same as the increase that accompanies an increase in SNAP benefits since, unlike regular income, these benefits must be spent on food. If participants' desired spending on food exceeds their benefits, however, economic theory predicts that an increase in SNAP benefits and an increase in income will have the same influence on food expenditures. Still, the marginal propensity to consume as applied to SNAP benefits has been estimated to be $0.17 to $0.47, compared with an average of $0.10 as applied to regular income (Breunig and Dasgupta, 2003; Burnstein et al., 2005; Fox et al., 2004; Fraker, 1990).

The difference between the effects of cash income and SNAP benefits on food expenditures was illustrated in the "food stamp cashout" studies of the 1980s. In these studies, participants were randomly assigned to receive their benefits either in the form of cash or, as was standard at the time, in the form of food stamps. Researchers examined participants' food expendi-

tures, and found that food spending was about 7 percent higher when the benefits came in the form of food stamps rather than an equivalent amount of cash (Breunig et al., 2001; Fraker et al., 1995). These findings implied a marginal propensity to consume food with SNAP benefits of $0.18-$0.28, which falls within the $0.17 to $0.47 range noted above.

Hoynes and Schanzenbach (2009) studied the influence of the receipt of nutrition assistance benefits, such as SNAP, through in-kind transfer, such as vouchers or Electronic Benefit Transfer (EBT) cards, on the purchasing power of low-income households. They examined data from the Panel of Income Dynamics from 1968 to 1978 to determine the impact of SNAP on food consumption and the effect of SNAP participation on labor supply. Collectively, their findings support the theory that SNAP benefits decrease overall out-of-pocket food spending but increase total spending on food. The analysis also found a decrease in the tendency of SNAP participants to consume food away from home, although the overall food environment during their study period of 1968-1978 was very different from the food environment of today. In addition, the program at that time had a "purchase requirement" that participants purchase food stamps, which could then be redeemed in stores to obtain foods having a value greater than the original price of the stamps; this requirement was eliminated in 1977. In contrast to the findings reported above, however, the marginal propensity to consume with SNAP income appears to be similar to that for cash income.

Where SNAP Participants Purchase Food

As described above, Frazao and colleagues (2007) and Castner and Mabli (2010) found that expenditures of SNAP participants and low-income households on food consumed at home represent the largest share of total food expenditures. A Canadian study derived similar results from a secondary analysis of nationally representative food expenditure data (Kirkpatrick and Tarasuk, 2003). Among the population groups studied, low-income households spent less overall on food but also spent 83.5 percent of their total food budget on food consumed at home, compared with 73.3 percent among higher-income households.

Evidence from USDA's Food and Nutrition Service (FNS) on where food for consumption at home is purchased suggests that the majority of SNAP participants use larger food outlets as their primary source for food and that they shop outside their immediate neighborhood. Mantovani and Welsh (1996) and Ohls and colleagues (1999) both report that about 90 percent of SNAP participants used a supermarket as their main food shopping outlet. However, many also shopped at other types of food outlets, including convenience stores, bakeries, produce stands, and farmers'

markets as secondary food sources. More recent data from USDA-FNS (Castner and Henke, 2011) about where EBT cards were used by participants show that about 64 percent of EBT purchases were made at supermarkets, accounting for 84 percent of the dollar value of foods purchased with SNAP benefits.

Types of Food Purchased by Low-Income and SNAP Populations

Leibtag and Kaufman (2003) analyzed food store scanner data to examine how low-income households economize on food purchases. They found that low-income households purchase more discounted items and private-label store brand products; take greater advantage of volume discounts; and purchase less expensive versions of a given product compared with higher-income households. Among the food types purchased, they found that low-income households purchase fewer fruits and vegetables and pay less for them than high-income households.

Frazao and colleagues (2007) found that among the lowest-income households, the largest food expenditure at grocery stores is for "other foods"—frozen prepared meals, canned and packaged prepared foods, snack foods, condiments and seasonings, sugar and other sweets, fats and oils, and nonalcoholic beverages. Meat purchases account for about 30 percent of the money spent on food in grocery stores, followed by fruits and vegetables (fresh, frozen, canned, dried, or juice), and lastly cereals and bakery products or dairy products.

Stewart and Blisard (2008) found that, compared with middle- and upper-income households, those with an income at or below 130 percent of the poverty threshold spent significantly less on six of the seven food categories studied—bread and baked goods, milk and dairy, beef, fruits, vegetables, and frozen prepared foods; only the amount spent on eggs did not vary by household income. However, a small increase in income corresponded to households allocating more money to only two of the seven categories—beef and frozen prepared foods. The authors note that these two categories of foods may be priorities for reasons of taste and convenience. For additional money to be allocated to fruits and vegetables, a household's income must be slightly greater than 130 percent of the federal poverty threshold.

Mabli and colleagues (2010b) did not directly examine what foods were purchased by SNAP participants but instead examined changes in the proportion of food expenditures going to foods identified in the 2010 DGA as "foods recommended for frequent consumption" and "foods not recommended for frequent consumption" when households spend more on food overall. In general, the study found that households spending more on food overall allocated a higher proportion of their total food expen-

ditures to foods such as fruits, vegetables, and dried beans and peas (i.e., foods recommended for frequent consumption), but also spent a higher proportion on "foods not recommended for frequent consumption" (e.g., baked desserts, salty snacks, other sweets) compared with households with lower total food expenditures. Because SNAP benefits raise households' purchasing power, the implication is that the benefits at least have the potential to raise the share of a household's food expenditures going toward these recommended foods.

Finally, to investigate whether additional SNAP benefits result in increased purchases of fruits and vegetables, Frazao and colleagues (2007) analyzed 2004-2005 data on household spending from the Consumer Expenditure Survey (BLS, 2012). They found that additional income influenced food purchasing patterns for fruits and vegetables only at incomes above $70,000 per year. Further, their analysis suggested that the cost of fruits and vegetables affects low-income households' purchases in the expected direction, but the magnitude of this effect is modest. A 10 percent discount in the price of fruits and vegetables leads to a 5 to 6 percent increase in purchases by low-income households, while coupons for 10 percent off lead to a 2 to 11 percent increase in purchases. These magnitudes are small enough to suggest that reductions in the cost of these foods would not have a large influence on the proportion of low-income households achieving recommended intakes of fruits and vegetables (Dong and Leibtag, 2010).

Dietary Intake

The committee considered evidence about the quality of dietary intake. In particular, the committee reviewed evidence on whether the steep increase in the quantity of grains available in the U.S. food supply as described earlier suggests an overall increase in carbohydrate intake among the U.S. population.

Kant and Graubard (2007) examined secular trends in the association between diet and indicators of socioeconomic position. Data from the National Health and Nutrition Examination Survey (NHANES) were analyzed for total carbohydrate intake over time, by poverty/income ratio and level of education, as indicators of socioeconomic position. The authors found persistent positive associations of poverty/income ratio and education level with consumption of nutrient-dense foods, particularly fruits and vegetables, and higher intakes of vitamins A and C and calcium. Across time, the percentage of obese adults increased in all socioeconomic groups, although the poverty/income ratio differential in obesity prevalence persisted (Kant and Graubard, 2007). The study further identified a positive association between socioeconomic position and amount of food and energy intake, as well as potassium intake, an association that has persisted over three decades.

Kirkpatrick and colleagues (2012) extended this research and assessed the extent to which Americans met dietary standards between 2000 and 2004. They found that few Americans met dietary recommendations for total fruits (17.5 percent), whole fruits (25.1 percent), total vegetables (12.9 percent), dark green vegetables (5.9 percent), orange vegetables (1.9 percent), dry beans and peas (3.5 percent), starchy vegetables (38.3 percent), whole grains (0.8 percent), and milk (7.7 percent). In addition, individuals from middle- and low-income households had significantly lower intakes for all of these food groups except dry beans and peas and starchy vegetables. Among racial/ethnic groups, the lowest percentage of those meeting the recommendations were African Americans. Most children also failed to meet current recommendations, although fewer differences were found by income in this age group. Most adults and children had high consumption of solid fats and added sugars.

Using data from the *What We Eat in America* component of NHANES (2007-2008), the committee reviewed intakes of selected micronutrients and macronutrients for Americans 2 years of age and older. In the bivariate analysis presented below, the committee made no attempt to adjust the estimated intake levels for the demographic characteristics of individuals in each of the groups examined. For example, lower-income and higher-income Americans may have different age distributions, which, in turn, could explain differences in their intake levels, as opposed to different consumption patterns. While NHANES has excellent measures of dietary intake and clinical markers of nutritional status, income and participation in nutrition assistance are not well measured. The survey does include the full 18-item Core Food Security Module, as well as information on SNAP participation. Nevertheless, it is but one dataset that includes only about 5,000 persons located in 15 counties across the country each year. The bivariate analysis may suggest whether there are substantial differences in dietary patterns between Americans at different intake levels that are worthy of further investigation.

On the other hand, data from the Institute of Medicine report *Strategies to Reduce Sodium Intake* (IOM, 2010) show that the median sodium intake from foods for individuals aged 2 years and over from households at greater than 185 percent of the poverty threshold was 3,362 mg/day, compared with 3,098 and 3,079 mg/day for those from households at 131-185 percent and at or below 131 percent of the poverty threshold, respectively (NHANES 2003-2006), suggesting, as noted above, that individuals from low-income households limited their sodium intake more than did those from higher-income households.

Findings of a report by Cole and Fox (2008), based on NHANES data, suggest that for all vitamins, minerals, and macronutrients assessed, the dietary intake among SNAP participants was comparable to that of

SNAP-eligible nonparticipants. Compared with higher-income adults, however, SNAP participants had lower intakes of several vitamins and minerals.

SNAP participants also had significantly lower scores for several of the components of the Healthy Eating Index (HEI)-2005, including total fruits, whole fruits, total vegetables, whole grains, milk, and healthy oils and solid fats and added sugars (Cole and Fox, 2008). (The HEI is discussed further below.) On the other hand, scores on the HEI-2005 components of dark green and orange vegetables, total grains, meat and beans, saturated fats, and sodium were no different for SNAP participants and higher-income individuals. Finally, Fernandes (2012) found that SNAP participation was not associated with frequency of consumption of soft drinks, 100 percent fruit juice, or milk among youth. Overall, the HEI-2005 score was statistically lower among SNAP participants compared with higher-income nonparticipants (Figure 3-4).

The available evidence does lead to one clear conclusion. Given changes in the availability of certain nutrients in the food supply and lower availability of fruits, vegetables, and low-fat or nonfat milk products, relative to current recommendations, along with evidence for a positive association between socioeconomic status and amount of food and energy intake, many U.S. population groups fall short of meeting current dietary recommendations.

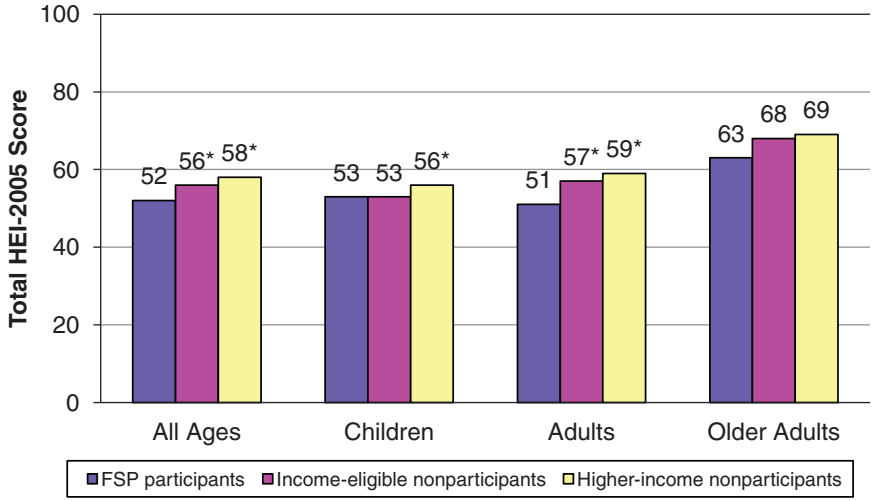

FIGURE 3-4 Healthy Eating Index-2005: Total scores.
NOTES: FSP = Food Stamp Program; HEI = Healthy Eating Index.
*Denotes statistically significant difference from Food Stamp Program participants at the 0.05 level or better. Estimates are age adjusted.
SOURCE: Cole and Fox, 2008.

ACCESS TO A HEALTHY DIET

Role of the DGA (*Dietary Guidelines for Americans*)

As noted in Appendix G, the DGA (USDA and HHS, 2010) serve as the scientific basis for all federal nutrition policy and nutrition programs, including SNAP. Since 1980 when the first DGA were published (USDA and USDHEW, 1980), the goals of the guidelines have evolved with changes in understanding of nutritional health needs. Today, however, a large proportion of the population, while meeting or exceeding the goals for intake of fat, saturated fat, grains, and protein, is failing to meet the goals for intake of fruits and vegetables, dietary fiber, and milk (Wells and Buzby, 2008).

This finding may be driven by a number of personal (individual), social, and environmental factors. As captured in the committee's framework (see Chapter 1), personal choice, food preferences, and taste are primary influences on food selection (see also Chapter 4). At the same time, environmental factors in some locales, such as limited availability of healthy foods, greater availability of highly processed foods, and limited access to outlets that offer a variety of food choices, may be key modifiable variables with an impact on food purchasing power—a particularly important concern for participants in nutrition assistance programs such as SNAP.

To assess the extent to which SNAP allotments are adequate to purchase a healthy diet, it is useful to have a tool for measuring the quality of participants' diets. While there is no single standard tool for this purpose, the HEI (Box 3-1) is one of several measures considered for assessing diet quality among SNAP households, maintenance of an adequate level of nutrition, and access to a healthy diet (see Chapter 1). The HEI was designed to measure and monitor the quality of diets consumed by the U.S. population and the low-income subpopulation (CNPP, 2012). Figure 3-5 shows that scores on the components of the original HEI remained relatively stable over the first decade of its use.

The HEI serves not only as a monitor for dietary intake over time but also as a predictor of health outcomes. To examine the effectiveness of the HEI in predicting health outcomes, McCullough and colleagues (2000a) used a food frequency questionnaire to measure the index (HEI-f) among healthy adults and estimated their risk for certain chronic diseases. They found that, compared with adults with good HEI-f scores (>80), a poor HEI-f score was only modestly associated with an increased risk of cardiovascular disease among women and with an increased risk of chronic disease and cardiovascular disease among men, and no associations were found between HEI-f score and cancer risk. The authors conclude that the weak association found between HEI-f score and markers of chronic disease may be due either to methodological limitations or to failure of the HEI

BOX 3-1
The Healthy Eating Index

The Healthy Eating Index (HEI) is a measure of the quality of diets consumed by Americans and assesses conformance to federal dietary guidance. It was developed using three 24-hour recalls as the data collection method. At present, there is no dietary questionnaire or screening tool that can be used to calculate the HEI.

The U.S. Department of Agriculture originally created a general classification for the HEI with a score >80 designated as good dietary intake, 51-80 as "needs improvement," and <51 as poor dietary intake. The original HEI was based on 10 foods or food components—grains, vegetables, fruits, milk, and meats; total fat and saturated fat as a percentage of total energy; total cholesterol; total sodium; and variety in the diet—each scored at a maximum of 10 points for a maximum total score of 100.

The revised HEI-2005 consists of 12 components (see text for description). The authors also removed the classification of "poor," "needs improvement," and "good" from the scoring system. Dietary intake is assessed on an energy-adjusted density basis (per 1,000 calories), providing an estimate of the relative proportions rather than the quantity of foods consumed. Higher scores are given for greater consumption of food-based components and lower scores for greater consumption of sodium and of solid fats and added sugars. The maximum scores per component range from 5 to 20, with a possible total of 100 points.

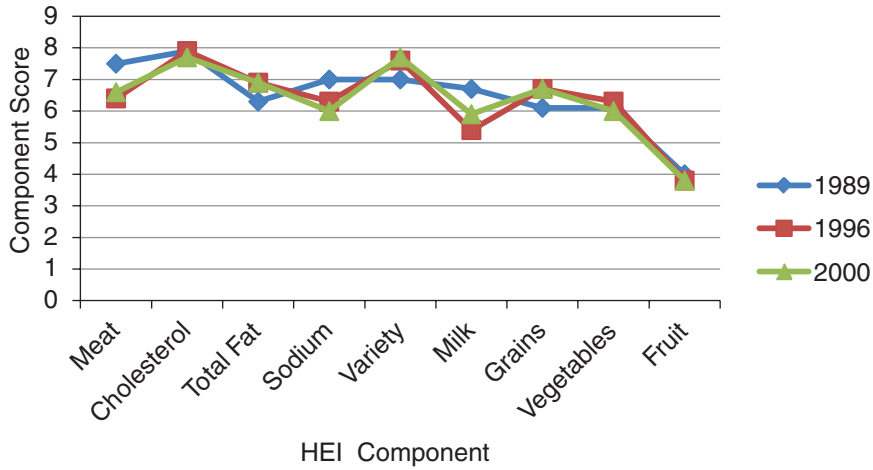

FIGURE 3-5 Comparison of Healthy Eating Index component scores, 1989-2000. SOURCES: Basiotis et al., 2002; Bowman et al., 1998; CNPP, 1995.

to reflect an optimal diet, so that it is inconclusive as to diet quality as a predictor of risk for chronic disease.

Another study, using NHANES data, found that HEI categories were significantly associated with higher odds of overweight and obesity after controlling for age, gender, income, education, race/ethnicity, physical activity, smoking, and alcohol use. These outcomes were similar and significant in gender-stratified models (Guo et al., 2004). Other studies found that lower HEI scores were associated with greater abdominal fat stores (Tande et al., 2010) and increased all-cause and cardiovascular mortality among older Americans (Rathod et al., 2012), lending support to the HEI as a predictor of diet-related health outcomes. These studies are important for understanding the methodological approach and effectiveness of the HEI as a monitoring tool for assessing diet quality and ultimately for establishing an approach to defining the adequacy of SNAP allotments.

The 2005 HEI update added new components, including oils, calories from alcohol, solid fats and added sugars, whole fruit, dark green and orange vegetables, legumes, and whole grains, consistent with the 2005 DGA (Guenther et al., 2007; HHS and USDA, 2005). Figure 3-6 shows the HEI scores for low-income compared with all income groups in the

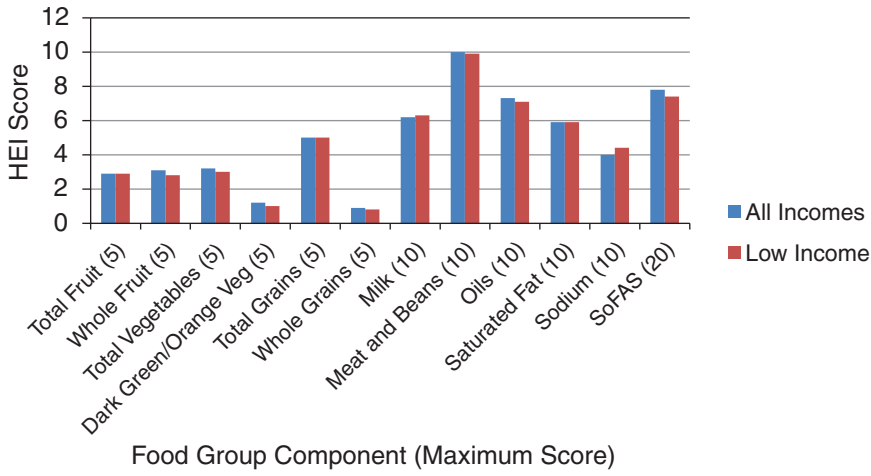

FIGURE 3-6 Comparison of Healthy Eating Index component scores (2005) for low-income and all income groups. Higher scores are given for greater consumption of food-based components and lower scores for greater consumption of sodium, saturated fat, and solid fats and added sugars.
NOTES: HEI = Healthy Eating Index; SoFAS = calories from solid fats and added sugars.
SOURCE: CNPP, 2008.

United States based on data gathered in NHANES 2003-2004 and reported in 2005 (CNPP, 2008). For this time frame, the overall average HEI scores were similar for both low-income and all income groups—56.5 and 57.8, respectively. When individual component scores were compared, however, low-income groups scored significantly lower on total vegetables, dark green and orange vegetables, legumes, and whole grains compared with all income groups, indicating lower compliance with the DGA in the former group.

Because of limitations of the HEI and changes in the DGA since 1990, researchers have sought to improve upon the original HEI and create a number of more specific indices in addition to the updated HEI-2005. Kant and colleagues (2000) created the Recommended Food Score (RFS), a tally of 23 recommended foods (such as oranges, broccoli, and baked or broiled fish) consumed at least once a week for a maximum total score of 23. McCullough and colleagues (2002) created the Alternate Healthy Eating Index (AHEI), comprising servings of vegetables, fruits, nuts, and protein; ratio of white to red meat; grams of cereal fiber; percentage of energy from trans fat; ratio of polyunsaturated to saturated fatty acids; multivitamin use; and servings of alcohol. Comparing the RFS with the AHEI, McCullough and colleagues found both to be strongly and significantly associated with chronic disease in men, particularly cardiovascular disease, while high AHEI scores were also associated with reductions in risk for chronic disease in women (McCullough et al., 2002). Chiuve and colleagues (2012) compared an updated AHEI-2010 with the HEI-2005 and found low scores on both to be strongly associated with coronary heart disease and diabetes.

Finally, in addition to the HEI, RFS, and AHEI, researchers developed the 2005 Dietary Guidelines Adherence Index, used to assesses adherence to the DGA recommendations specific to dietary intake and comprising 11 energy-specific food intake items and nine nutrient intake items (Fogli-Cawley et al., 2006). Higher scores on this index were associated with lower markers of insulin resistance and fasting insulin (Fogli-Cawley et al., 2007).

In assessing the strength and quality of the evidence, the committee determined that, because all the studies assessing the association between diet quality and chronic disease outcomes are cross-sectional and involve adult cohorts, a causal relationship between diet quality and risk for chronic disease cannot be demonstrated. However, there is no standard approach to measuring diet quality comprehensively. As the nutrition field continues to develop more refined and nuanced measures of diet quality that are specific to various chronic diseases, work is likely to continue on developing a comprehensive diet quality index that can be used to measure an optimal diet that is linked to the DGA and can serve as an indicator of risk of chronic disease.

At present, the most effective tool for measuring diet quality is the HEI-2005, which can be applied to subgroups such as low-income, including SNAP, populations within the general U.S. population. There are limitations, however, to the effectiveness of the HEI-2005 as a tool for evaluating the adequacy of SNAP allotments, because there is no consensus on how well the index actually tracks dietary intake and therefore how useful it is as a measure for optimal diet. Thus, one cannot conclude that the SNAP program does not contribute to improved diet quality because it may be that (1) the measure used for nutritional status is not reliable and/or (2) a number of other factors beyond income and participation in nutrition assistance programs influence dietary intake. In sum, the available evidence is insufficient to draw conclusions about associations between dietary intakes consistent with recommendations of the DGA and the adequacy of SNAP benefits to ensure access to a healthy diet.

Impact of SNAP Benefits

The committee considered the analytical challenge of self-selection of SNAP participants into the program, as well as the issue of underreporting of participation in the studies reviewed. The committee also considered the challenge of measuring indicators of diet quality because, in addition to the limitations discussed above, such studies typically are based on information collected through dietary surveys, which are expensive and rely on self-reported information. Moreover, a number of studies designed to estimate the impact of SNAP on indicators of diet quality were conducted more than 10 years ago.

Fox and colleagues (2004) summarize this older research, concluding that "the literature strongly suggests that the Food Stamp Program (SNAP) has little to no impact on individuals' dietary intake" (p. 62). Gleason and colleagues (2000) estimated the effects of program benefits on individuals' dietary intake using a regression model to control for observable characteristics, including demographic and socioeconomic characteristics, as well as less common controls, such as dietary knowledge and attitudes, health status, and exercise frequency. Overall, this study found no statistically significant relationships between receipt of SNAP benefits and mean intake of nearly all the vitamins, minerals, and food groups they examined. In a similar study, Wilde and colleagues (2000) found no association between SNAP participation and consumption of fruits, vegetables, grains, and dairy products, nor did they find that SNAP participation was associated with increased consumption of meats, added sugars, or total fat.

The body of research examining the impact of SNAP on participants' body mass index (BMI) and obesity risk is also ambiguous. Some studies found evidence for a positive association between SNAP participation and

increased BMI and risk of obesity among adult women, but not among children, the elderly, or adult men. Others found no significant relationship between SNAP and obesity even among adult women (Chen et al., 2005; Gundersen et al., 2009; Jilcott et al., 2011a,b).

A recent literature review on the relationship between SNAP participation and obesity found no evidence to support a significant relationship among children, adult men, or elderly participants of either sex (Ver Ploeg and Ralston, 2008). However, the same review did find evidence of a positive correlation between SNAP participation and mean BMI and obesity risk among adult women. A number of observational studies found a positive relationship between SNAP participation and risk for increased BMI or obesity, particularly among women (Baum, 2011; Chen et al., 2005; Gibson, 2003, 2006; Leung et al., 2012; Meyerhoefer and Pylypchuk, 2008); however, estimates of the magnitude of the effect varied widely across studies, ranging from 3 percent to about 60 percent.

Other research failed to find a significant relationship between SNAP participation and obesity among adult women. Kaushal (2007) examined effects of SNAP participation on BMI among adults in immigrant families using participation data collected after eligibility revisions that followed enactment of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996.[2] The study found no significant association between SNAP participation and increased BMIs among low-educated unmarried mothers. Burgstahler and colleagues (2012) examined whether SNAP participation with or without household financial stress was associated with childhood overweight and obesity. Data derived from the Survey of Household Finances and Childhood Obesity were used to compare childhood obesity outcomes among 360 SNAP-eligible children, aged 2 to 18 (70.3 percent of whom were SNAP participants). After controlling for household financial stress, the study found a negative association between SNAP participation and obesity among SNAP-eligible children.

Kreider and colleagues (2012) analyzed data from the 2001-2006 NHANES using a method to derive informative bounds on the average treatment effect of SNAP on a range of health outcomes, including obesity. This method was used to account for both program self-selection bias and underreporting of participation status. The analysis could not rule out the possibility that SNAP participation either increases or decreases poor health, but the authors concluded that it may be inversely related to risk for child obesity.

Collectively, this evidence is insufficient to conclude a causal relationship between SNAP benefits and diet-related health outcomes in the

[2]Personal Responsibility and Work Opportunity Reconciliation Act of 1996, Public Law 104-193 (August 22, 1966).

low-income population. There is some evidence, although inconsistent, to support an association between SNAP participation and risk for high BMI in women.

FOOD INSECURITY

As discussed in Chapter 2, food insecurity, defined as "inadequate or unsure access to enough food for active, healthy living" (Andrews and Nord, 2009, p. 33), is due most often to a lack of money or other resources. (A description of how food security is measured is also given in Chapter 2.) As noted by Coleman-Jensen and colleagues (2012a), food insecurity is determined by the resources a household has available with which to purchase food. For example, high housing costs can result in less money available to purchase food, particularly among low-income populations (Fletcher et al., 2009; Kirkpatrick and Tarasuk, 2007, 2011). Seasonally increased household expenses for heating and other utilities can also compromise the amount of money available for food purchases (Bhattacharya et al., 2003; Nord and Kantor, 2006).

While food insecurity affects only a portion of the U.S. population, it is an increasing concern, particularly among SNAP participants, because of its effects on health, productivity, and well-being. The following discussion summarizes the evidence on measures of food insecurity and its prevalence among low-income and SNAP populations, along with use of the emergency food system. It then examines the relationship between food security and measures of the quantity and type of food available for consumption, as well as the health effects associated with food insecurity. The discussion includes a summary of the evidence on the impact of SNAP benefits on food insecurity among participants.

Prevalence of Food Insecurity

Population data from the 2011 Current Population Survey Food Security Module (CPSFSM) show that 85.1 percent of all households in the United States were food secure and 14.9 percent were food insecure, including 5.7 percent (6.8 million households) that had very low food security at some point during the past year (Coleman-Jensen et al., 2012a). This means that for one or more individuals in the household, eating patterns were disrupted or food intake was reduced at some point during the previous 12 months (Figure 3-7).

In the same report, the prevalence of food insecurity was found to be higher among households with children (birth through 18 years). Within that group of households, 20.6 percent were food insecure, including 10.6 percent in which only adults experienced food insecurity and 10.0 percent in

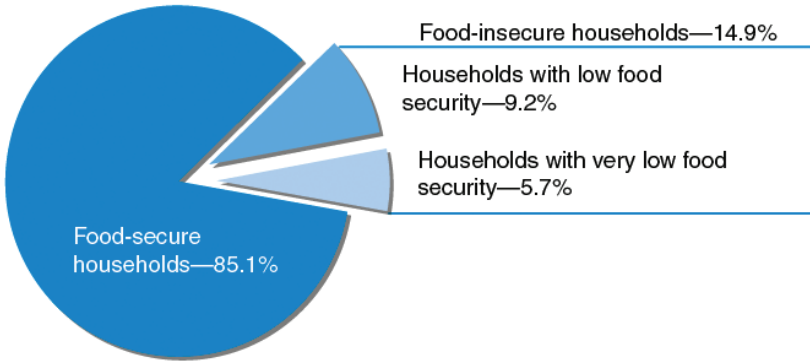

FIGURE 3-7 U.S. households by food security status, 2011.
SOURCE: Coleman-Jensen et al., 2012a. Calculated using data from the December 2011 Current Population Survey Food Security Supplement.

which both adults and children did so. These national figures suggest that very low food insecurity among children is relatively rare. While children experienced low food security in 9.0 percent of such households, they had very low food security in only 1.0 percent of such households (Figure 3-8).

Trends between 2010 and 2011, shown in Figure 3-9, suggest that the prevalence of food insecurity has remained relatively stable, after rising sharply in 2008 (see also Chapter 2, Figure 2-5, for trends between 1995 and 2011). There was a slight but statistically significant decrease in very low food security in 2010, although 6.4 million households still were thus categorized (Coleman-Jensen et al., 2011). In 2011, very low food security in households with children was most common in households headed by single women (1.8 percent) and in African American and Hispanic households (1.9 percent each) (Coleman-Jensen et al., 2012a).

As discussed in Chapter 2, the current classification of household food security status also recognizes the category of "marginal food security," defined as answering in the affirmative one or two of the CPSFSM questions. Although marginal food security is not directly reported in the annual Household Food Security report, the report's Statistical Supplement does report responses to individual questions (Table S-6): 19.7 percent reported they were "worried food would run out before I/we got money to buy more," and 16.2 percent reported "the food bought didn't last and I/we didn't have money to buy more" (Coleman-Jensen et al., 2012b). Previously, these households were classified as food secure; however, a number of studies have demonstrated that individuals from marginally food secure households have demographic and socioeconomic characteristics similar to those from households with low food security (Coleman-Jensen, 2010;

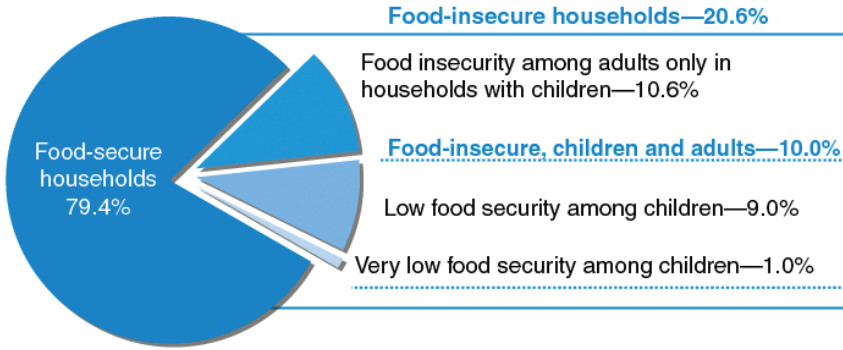

FIGURE 3-8 U.S. households with children by food security status of adults and children, 2011.
SOURCE: Coleman-Jensen et al., 2012a. Calculated using data from the December 2011 Current Population Survey Food Security Supplement.

Laraia et al., 2006) and have increased risk of poor cognitive and health outcomes (Jyoti et al., 2005; Parker et al., 2010; Whitaker et al., 2006; Winicki and Jemison, 2003).

As with other social and economic indicators, food insecurity is unevenly distributed across the population. There are clear differences in prevalence depending on household composition, race/ethnicity, household income/poverty ratio, area of residence, and geographic region of the country (Figure 3-9). Food insecurity is more prevalent in households with incomes below the federal poverty threshold—41.1 percent, compared with 7.0 percent among those with incomes greater than 185 percent of the poverty threshold (Coleman-Jensen et al., 2012a). Compared with the national average, higher rates of food insecurity are found in households with children (11.3 percent of children live in households in which one or more children are food insecure), those headed by a single woman or man (36.8 and 24.9 percent, respectively), and African American (25.1 percent) and Hispanic (26.2 percent) households. The 2011 CPSFSM also identified differences in the prevalence of food insecurity for large cities (17.7 percent), nonmetropolitan areas (15.4 percent), and suburbs and non-principal-city metropolitan areas (13.2 percent). Geographically, food insecurity is greater in the South and West, while the prevalence pattern for very low food insecurity is similar in all areas (5.3-6.1 percent) (Coleman-Jensen et al., 2012a).

In addition to being more prevalent among low-income households, food insecurity is much more prevalent among SNAP participants than among nonparticipants. Among households that received SNAP benefits in 2010, Table 3-1 indicates that more than half (51.7 percent) were food insecure,

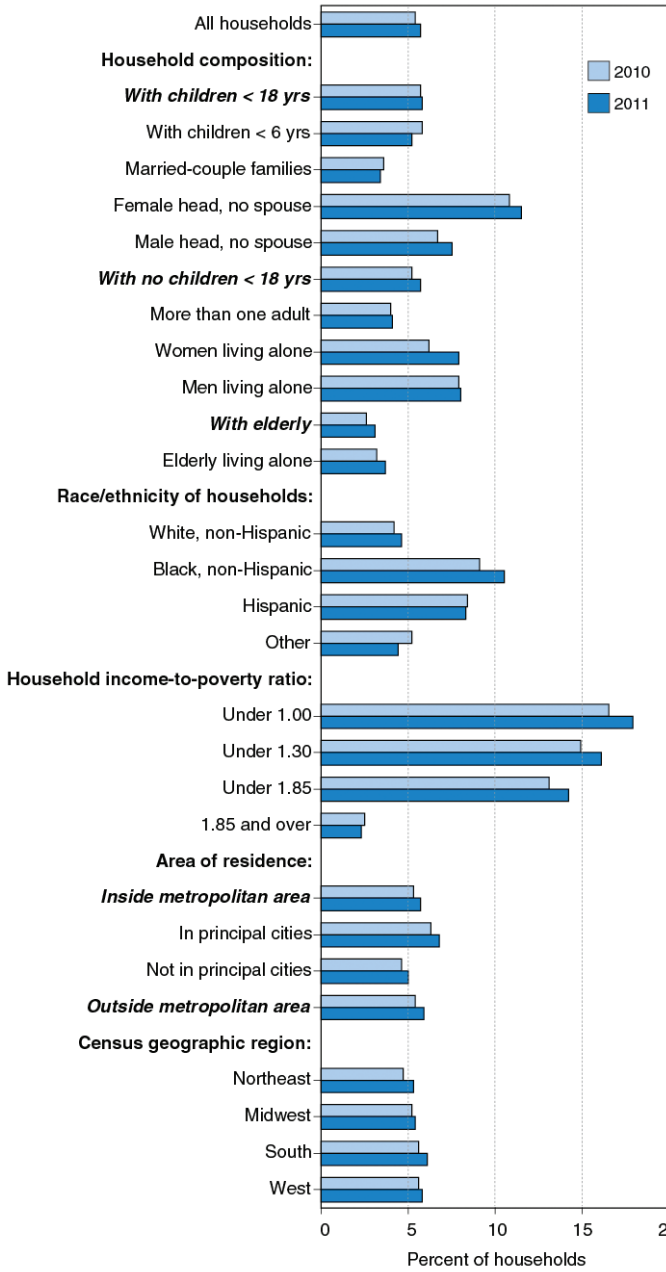

FIGURE 3-9 Composition and characteristics of food insecure households, 2010-2011.
SOURCE: Coleman-Jensen et al., 2012a.

TABLE 3-1 Food Security Status Among SNAP-Eligible Households with Incomes Below 130 Percent of the Federal Poverty Threshold, 2011

		Food Insecure (%)		
	Food Secure (%)	All	Low Food Security	Very Low Food Security
Received SNAP benefits in previous 12 months	48.3	51.7	28.7	23.0
Received SNAP benefits in all 12 months	50.9	49.1	26.8	22.3
Received SNAP benefits in 1 to 11 months	44.0	56.0	31.8	24.2
Did not receive SNAP benefits	72.3	27.7	16.4	11.3

NOTE: SNAP = Supplemental Nutrition Assistance Program (formerly the Food Stamp Program).
SOURCE: Coleman-Jensen et al., 2012a. Calculated by the Economic Research Service using data from the December 2011 Current Population Survey Food Security Supplement.

including 23.0 percent that had very low food security (Coleman-Jensen et al., 2012a). These rates of food insecurity among SNAP participants were much higher than the rates among the U.S. population overall, but also were much higher than the rates among other low-income households. Among income-eligible households that did not participate in SNAP in 2011, 27.7 percent were food insecure, including 11.3 percent with very low food security (Coleman-Jensen et al., 2012a; see Table 3-1). In other words, the rates of food insecurity among SNAP households were nearly twice those of other low-income households. As discussed below, this does not mean that SNAP contributed to higher food security among participating households; rather, it suggests that households experiencing low and very low food security turn to SNAP for relief.

Use of the Emergency Food System

A private emergency food system operates alongside the federal nutrition assistance programs, primarily through food pantries and soup kitchens, to help alleviate food insecurity. In the 2011 CPSFSM, 5.6 percent of respondents reported using a pantry and 0.5 percent eating at a soup kitchen. Nearly 53 percent of pantry users had also been SNAP participants during the previous 30 days (Coleman-Jensen et al., 2012b). Feeding America (formerly America's Second Harvest)—the largest network of food banks in the United States, serving about 37 million people annually—regularly surveys its participating agencies and clients, most recently in 2009 (Mabli et al., 2010a). The 2009 survey showed that 71 percent of clients had incomes below the federal poverty threshold, and three-quarters were food insecure. More than 40 percent of clients were from households receiving

SNAP benefits, compared with 35 percent in the 2005 survey. In 2009, about 14.5 million low-income households received emergency food services, "an increase of 46 percent in unduplicated annual clients since the Hunger in America 2006 report" (Feeding America, 2010, p. 4). The 2008 Farm Bill[3] authorized the appropriation of $15 million for each of fiscal years 2008 to 2012 to bolster this informal system. Additionally, funding for the Emergency Food Assistance Program (TEFAP), which supports food purchases by food banks and other emergency feeding organizations, was set at $140 million per year.

Between the federal data sources on emergency food use and the Feeding America survey data, it is clear that while federal nutrition assistance programs, including SNAP, provide substantial support to improve the food security of many households, a considerable number of people remain food insecure and must seek additional food from other sources, such as the emergency food system. The far-reaching and pervasive use of food pantries and soup kitchens provides anecdotal support for the proposition that SNAP may not be meeting the food/food security needs of the low-income population.

Food Security and the Quantity and Availability of Food

There is evidence to suggest a relationship between food security and measures of the quantity and types of food available for consumption (Brinkman et al., 2010). While some evidence shows a negative although nonlinear association between income level and availability of food (Leete and Bania, 2010), other evidence shows that low-income households may compromise on the type of food consumed while the quantity may be the same. To illustrate, Kendall and colleagues (1996), using the Radimer/Cornell measure of household food security, found that among a small sample (N = 193) of women in rural upstate New York, those living in food insecure households had less food available in the household than those in more food secure households. Two cross-sectional surveys examining relationships between income level and diet quality found that low-income families view food costs as "flexible" when faced with financial constraints and find ways to stretch food dollars that include purchasing less expensive versions of the same foods they would purchase if more money were available (Dachner et al., 2010; Hoisington et al., 2002).

A report on interviews regarding food management practices among people with limited resources identified both acceptable and unacceptable practices used to manage the household food supply. The acceptable practices included preparing low-cost foods and preserving home-grown

[3]Food, Conservation, and Energy Act of 2008, Public Law 110-234, Sec. 4202, p. 612.

foods. Unacceptable practices included amending spoiled foods, restricting personal food intake to feed other family members, and obtaining food opportunistically (Kempson et al., 2002). Taken together, these studies indicate that food insecurity aligns with decreased food intake.

Bauer and colleagues (2012) analyzed responses to a survey of parents of 432 kindergarten-age children living on the Pine Ridge Indian reservation. The survey included measures of food security, children's BMI and dietary intake (by frequency of consumption), home food availability, food practices, and barriers to having healthful foods in the home. About 40 and 30 percent of parents, respectively, reported experiencing food insecurity or very low food security in the previous 12 months. Children of parents who reported very low food security were significantly more likely to have consumed hot or ready-made food from a convenience store or gas station, although there were no differences by food security status in food availability, frequency of fast-food consumption, number of family meals, or food shopping trips among the families surveyed. Parents who were food insecure were more likely to report little variety in fruit and vegetable choices, poor condition of fruits and vegetables in their food stores, low acceptance of fruits and vegetables by family members, and lack of time for food preparation.

Associations Between Food Security and Diet Quality

Food insecurity, as noted above, can be associated with the quantity and types of food available to households. Evidence is more limited, however, on the relationship between food insecurity and diet quality. A recent study of 67 residents of Boston used concept mapping to discern which factors drive food purchasing behaviors across income levels and how the consequent purchases influence diet quality (Walker and Kawachi, 2012). The study found that both food secure and food insecure participants considered the same factors to be important for healthy eating; both groups also assigned the same importance to factors that hinder healthy eating. The groups differed in food choices, however, with the food insecure choosing more energy-dense foods than the food secure. Food insecure participants described their food availability as being dependent largely on emergency food assistance programs. The prevalence of obesity among study participants was greater in the food insecure than in the food secure group. The energy density of the foods that were received or selected by participants was unknown. The authors interpret the study results as suggesting that food insecure participants may be consuming larger quantities of food from all available sources because of the uncertainty of having food available, which may have an impact on caloric intake.

Additional evidence for an impact of food security on diet quality supports a positive relationship between increased spending on food and diet

quality, although the improvement, as measured by HEI score, is small and varies by food category (Bernstein et al., 2010; Mabli et al., 2010a). As indicated by the Walker and Kawachi (2012) study, households may respond to the dilemma of limited resources for food by substituting energy-dense, nutrient-poor, less expensive foods for more expensive nutrient-dense ones, with a resulting decrease in micronutrient intake (Basiotis and Lino, 2002; Darmon et al., 2002; Drewnowski et al. 2004). Such a diet can contribute to overweight or obesity, which in turn increases the risk for chronic diseases and may also contribute to the risk for nutrient inadequacy.

Few specific nutrient deficiencies have been linked to food insecurity in developed countries such as the United States. Using the child food security scale developed by Nord and Bickel (2002) and measures of iron status, Skalicky and colleagues (2006) examined associations between food insecurity and iron nutriture in young children (aged 6 months to 3 years) seen in hospital emergency departments. Although the numbers are small, the adjusted logistic regression analysis controlling for confounders showed that food insecure children were nearly more than twice as likely to have iron deficiency anemia compared with food secure children. Brotanek and colleagues (2007) conducted a retrospective analysis of iron deficiency prevalence in children using data from the 1999-2002 National Health and Nutrition Examination Survey (NHANES). Although the results were not statistically significant, the prevalence of anemia in children from food insecure households was 12 percent, compared with 7 percent in those from food secure households. Similarly, in their analysis of NHANES data (1988-1994), Alaimo and colleagues (2001) found that the prevalence of iron deficiency was higher in food insufficient preschool children than in food sufficient children (11.6 percent vs. 8.6 percent), although this differential was not significant in a regression analysis.

Many of the studies reviewed by the committee that evaluate associations between household food security and nutritional status in population subgroups are inconsistent in both design and quality. Taken together, however, they suggest that associations between low household food security and some measure of decreased nutritional status, particularly among women (Kendall et al., 1996; Tarasuk, 2001; Tarasuk and Beaton, 1999) and the elderly (Bhattacharya et al., 2004; Dixon et al., 2001; Lee and Frongillo, 2001a,b; Wolfe et al., 1998), should be taken into consideration. While not finding specific nutrient deficiencies, Dixon and colleagues (2001) report both lower dietary intakes (<50 percent of the Recommended Dietary Allowances [RDAs]) and lower serum levels for selected nutrients in adults classified as being from food insufficient families compared with those from food sufficient families in NHANES III. Younger adults (aged 20-59) had 1-day intakes below 50 percent of the RDAs for vitamin E and Adequate Intake (AI) for calcium for 1 day, while older adults (>60)

had lower 1-day intakes (<50 percent of the RDAs) for zinc and iron. The authors report that about one-third of the younger and older adults from food insecure families had lower serum concentrations of total carotene and vitamin C. It is important to note that factors such as smoking or infection could also affect serum levels of these indicators. Additionally, while the serum nutrients and dietary intakes were individual, food insufficiency was measured at the household level.

In their analysis of NHANES III, Bhattacharya and colleagues (2004) found that food insecurity in adults (aged 18-64) had "large effects on the probability of being low in serum nutrients among both whites and blacks," as well as Hispanics with low incomes. They concluded that for adults, food insecurity was associated with poorer-quality diets and higher probabilities of low serum nutrients. However, the committee concluded that evidence for an association between food insecurity and prevalence of nutrient inadequacy is less compelling than that for an association between food insecurity and risk for chronic disease.

Health Effects Associated with Food Insecurity

There are various health conditions for which an association with food insecurity has been reported. Only selected examples are discussed below.

Pregnancy and Breastfeeding Outcomes

Evidence reviewed in the Institute of Medicine report *Weight Gain During Pregnancy* (IOM, 2009) strongly suggests that the most influential factors in fetal growth are prepregnancy BMI and weight gain during the first and second trimesters. Olson and Strawderman (2008) examined food insecurity in early pregnancy but did not find an association with increased risk for obesity in food insecure women up to 2 years postpartum. The study findings were strong, however, for an association between both obesity and food insecurity during early pregnancy and risk for excess gestational and postpartum weight gain. In a study of women in the Pregnancy, Infection, and Nutrition prospective cohort, Laraia and colleagues (2010) found that in a model adjusted for demographic and socioeconomic characteristics, food insecurity at any level was positively associated with gestational diabetes. They also found that food insecurity was strongly related to prepregnancy obesity and excessive weight gain during pregnancy, both of which are associated with poorer birth outcomes. Early evidence from studies of pregnancy outcomes suggests that gestational weight gain may be a determinant of risk for obesity and obesity-related health outcomes in the offspring; however, this evidence is still emerging (Li et al., 2007; Oken et al., 2007; Ong et al., 2000; Sowan and Stember, 2000; Wrotniak et al., 2008).

Carmichael and colleagues (2007) examined data from a large, population-based case control study of primarily Hispanic women in California to determine associations between three levels of food security (food secure, food insecure without hunger, and food insecure with hunger) and risk for neural tube defects, orofacial cleft, and conotruncal heart defect. Their survey of 1,189 cases and 695 controls identified positive associations between food insecurity and anencephaly, cleft palate (modified by BMI), and tetralogy of Fallot (indicator of neural tube defect), suggesting that food insecurity is associated with increased risk for poor developmental outcomes.

Few studies have been conducted on the effects of food insecurity on breastfeeding. Zubieta and colleagues (2006) examined breastfeeding duration in infants from food secure and food insecure households using data from NHANES (1999-2000 and 2001-2002). They found that fewer infants were breastfed in the food insecure households, and among all infants that were breastfed, the duration was 38 days longer in the food secure than in the food insecure households.

Risk for Chronic Disease

Diabetes is a serious chronic disease that is particularly prevalent in low-income and minority populations (Beckles et al., 2011). African American and Latino adults are 1.7 to 1.8 times more likely to have diabetes than white adults (Schiller et al., 2012). In a two-city study of a community safety net clinic serving low-income, multiethnic individuals with type II diabetes, Seligman and colleagues (2011) found that nearly half were food insecure. Compared with food secure participants, those who were food insecure had higher levels of glycosylated hemoglobin (HbA1c), an important marker of glucose control. Further, about 30 percent of participants reported having a severe hypoglycemic event in the past year, and 9 percent reported four or more such events. The significance of these differences remained after adjusting for demographic and other risk factors. The relationship between food insecurity and lack of glycemic control was partially explained by difficulty following a prescribed diet and increased emotional distress related to diabetes. Consistent with these studies, Marjerrison and colleagues (2011), using a combination of telephone interviews and chart reviews for 183 Nova Scotian families with a child with type I diabetes, found that HbA1c levels were higher in children from food insecure households than in those from food secure households (9.5 ± 2.13 percent versus 8.96 ± 1.50 percent).

Seligman and colleagues (2010a) used NHANES (1999-2004) data to examine diet-related chronic diseases and prevalence of food insecurity in adult low-income (<200 percent of the poverty threshold) participants. They found that in adjusted models, food insecurity was associated with

self-reported hyperlipidemia and hypertension. Further, adults living with the most severe levels of food insecurity had a twofold increased risk of diabetes compared with adults with immediate access to healthful foods. Additional work by Seligman and colleagues (2010a,b, 2011) showed that food insecure individuals with diabetes were twice as likely as food secure individuals with diabetes to experience severe hypoglycemic episodes and poor diabetes self-management.

Self-Reported Health or Health Status

Various studies examining food insecurity have found that individuals who are food insecure often report poorer health. To illustrate, self-reported health status in food secure and food insecure women was reported in a study using data from the 1999 Panel Study of Income Dynamics (Jones and Frongillo, 2006). Although only 8 percent of all women surveyed were food insecure, younger food insecure women reported fewer sick days but were far more likely to report their health as fair or poor compared with older food secure women. Another study of food insecurity and self-reported health of adults in the lower Mississippi Delta found that about 20 percent of this population-based sample was food insecure and that the food insecure were more than twice as likely as food secure participants to report their health as fair/poor (Stuff et al., 2004). In a multisite study of young children that was part of the Children's Sentinel Nutrition Assessment Project, parents in food insecure households were nearly twice as likely as parents in food secure households to report their child's health as fair or poor (Cook et al., 2004).

Collectively, the strongest evidence for an association between food insecurity and adverse health outcomes is in adults. Evidence for an association between food insecurity and increased risk for obesity is also stronger for adults than for children, and the association with increased risk for type 2 diabetes or adverse diabetes outcomes is stronger than that for other chronic diseases. The evidence is unclear, however, on whether poor health status and risk for chronic disease are due to food insecurity or whether they lead to greater risk for food insecurity.

Impact of SNAP Participation on Food Insecurity

Evidence reviewed by the committee suggests that SNAP participation can reduce the prevalence of food insecurity (Borjas, 2004; Mykerezi and Mills, 2010; Nord and Prell, 2011; Van Hook and Balistreri, 2006; Yen et al., 2008). In interpreting this evidence, the committee considered that self-selection of SNAP participants into the program could create a bias. For example, Nord and Golla (2009) examined monthly data on both house-

hold SNAP participation and food insecurity and found that in the months immediately prior to entering the program, households experienced a steady increase in food insecurity. In particular, the prevalence of very low food security rose from 8 percent to 20 percent in the months before a household entered SNAP. This pattern suggests that these households were experiencing events that both led to food insecurity and prompted their decision to enter the program. In the months following their entry into SNAP, the households' levels of food insecurity declined (with very low food security declining back to about 12 percent), evidence suggestive of beneficial effects of the program on this outcome (Nord and Golla, 2009).

In contrast to the findings of Nord and Golla (2009), several other studies examining whether SNAP participation improves food security while accounting for self-selection bias found that the benefits either had no effect or were associated with higher levels of food insecurity (Gibson-Davis and Foster, 2006; Gundersen and Oliveira, 2001; Jensen, 2002; Wilde and Nord, 2005). More recently, however, Bartfeld and Dunifon (2006) found lower food insecurity among near-poor and low-income populations in states with high SNAP participation rates compared with states with low participation rates, suggesting the possibility of beneficial program effects. Borjas (2004) and Van Hook and Balistreri (2006) examined food insecurity among immigrants whose program eligibility was affected by the Personal Responsibility and Work Opportunity Reconciliation Act[4] and found lower levels of food insecurity among immigrant households that remained eligible for SNAP compared with similar groups that lost their eligibility as a result of the legislated changes. Similarly, Nord and Prell (2011) found that food insecurity among the SNAP-eligible population fell after passage of the American Recovery and Reinvestment Act of 2009 (ARRA),[5] which increased SNAP benefit levels. The study found further that the amount spent on food by SNAP-eligible low-income households increased by 5.4 percent, and about 2.2 percent of that increase may be attributable to changes resulting from passage of the ARRA. SNAP-ineligible households with incomes just above the poverty threshold increased their food expenditures by a smaller percentage than low-income SNAP-eligible households, and the prevalence of food insecurity among the former households did not decline. There was no similar trend of increased food expenditures among those eligible for SNAP. Finally, two other studies using a statistical approach to account for both measured and unmeasured characteristics potentially related to entry into SNAP found that SNAP participation led

[4]Personal Responsibility and Work Opportunity Reconciliation Act of 1996, Public Law 104-193, 104th Congress (August 22, 1966).

[5]American Recovery and Reinvestment Act of 2009, Public Law 111-5, 111th Congress (February 17, 2009).

to a statistically significant reduction in rates of food insecurity (Mykerezi and Mills, 2010; Yen et al., 2008).

An additional study estimated the impact of SNAP on food security using an approach for dealing with self-selection into the program that relied on a few strong assumptions and produced upper and lower bounds on the possible effect of the program (Kreider et al., 2012). The study focused on the impact of SNAP on child nutritional health based on data derived from the 2001-2006 NHANES. The analysis included households with children eligible to participate in SNAP; a final weighted sample of 4,418 children was obtained. Socioeconomic and demographic characteristics of the sample were compared with national estimates obtained from the 2003 CPS, December Supplement. The study also accounted for the possibility of error in the measurement of SNAP participation in survey data. Each of the studies of the impact of SNAP on food insecurity noted above relied on survey-based measures of SNAP participation that have been found to be subject to measurement error when compared with more accurate administrative sources of this information (Meyer et al., 2009). Kreider and colleagues (2011) found that both the lower and upper bounds of the estimated impact of SNAP on food insecurity fell below zero, suggesting that the program reduces food insecurity among participants. In one model, the results implied that SNAP reduces the prevalence of food insecurity by at least 8 percentage points, and perhaps by a larger amount. Taken together, the evidence suggests that SNAP benefits can help alleviate food insecurity; however, the evidence is less conclusive among certain subgroups of SNAP participants.

Overall, the evidence on the impact of SNAP participation on food insecurity is moderately strong. While there have been no randomized controlled trials that can shed light on how SNAP affects household food insecurity, the nonexperimental studies examining this question have made serious efforts to account for the possibility of selection bias in the impact estimates. In particular, these studies have used various methods to account for observed and unobserved factors that lead some households to receive SNAP benefits and others to not participate. Although their methods have varied, the studies generally have found consistently that SNAP benefits lead to a reduction in rates of food insecurity among participating households. The available evidence is not clear, however, on whether poor health status and risk for chronic disease are due to or lead to greater risk for food insecurity.

DATA AND ANALYTICAL CHALLENGES TO ASSESSING THE ADEQUACY OF SNAP ALLOTMENTS

A number of challenges arise in assessing access to a healthy diet. First, nutrition has many dimensions, and no single measure or standard

approach can capture these multiple dimensions. The most commonly used summary measure of diet quality is the HEI-2005, and improvement in HEI scores among both the general population and low-income groups is a performance measure for the goal of "improving the nation's nutrition and health" in USDA's Strategic Plan for 2005-2010.

HEI-2005 scores show that most Americans, including SNAP participants and other low-income groups, are falling short of meeting the current DGA. This failure among Americans at all income levels highlights that the HEI-2005 (or other measures of diet quality) should not be used as a sole measure of the adequacy of SNAP allotments. SNAP participants—and other Americans—may have reasons for choosing foods with low nutrient density, and limited household resources for obtaining food is just one of these reasons. A related challenge to assessing access to a healthy diet is entailed in measuring diet quality. A number of methodologies are used to collect data on dietary intake. Interviewer-administered 24-hour dietary recalls are appropriate for a less educated population for monitoring and surveillance purposes. This method decreases respondent burden and greatly improves data quality compared with other methods; however, it is expensive, and a protocol using multiple 24-hour recalls is challenging to complete.

A limited number of datasets include dietary intake at the individual level. Most national-level datasets cannot be used to assess individual-level diet quality because this type of data cannot be aggregated by income level or program participation. Given these limitations, NHANES is currently the best dataset available for examining diet quality in low-income, including SNAP, populations because it is based on state-of-the-art data collection on dietary intake, includes the full 18-item Core Food Security Module, and includes information on SNAP participation. Nevertheless, NHANES is only one dataset, and although it examines a nationally representative sample, only about 5,000 persons located in 15 counties across the country are sampled each year. Furthermore, inherent challenges arise in identifying whether respondents within the same household are related and with linking individuals to external data sources. In addition, NHANES measures SNAP participation through self-report and includes substantial measurement error. Linking the NHANES data to another administrative data source with more accurate reporting of SNAP participation might improve understanding of the association between SNAP participation and dietary intake. Another limitation of NHANES is that, because it is cross-sectional, it does not permit tracking changes in food security or access to a healthy diet over time.

More research is needed to test the validity of the HEI as a comprehensive measure that captures overall diet quality, whether it is internally reliable and therefore highly correlated with other important components of

the diet, and whether it is a reliable measure across time and across studies. It will be difficult to evaluate the adequacy of SNAP allotments until agreement is reached on the type of diet quality index needed for this purpose.

Thus, longitudinal data on SNAP participation, food security, and dietary intake are needed. With such data, researchers could track changes in the outcomes of food security and diet quality over time and relate changes in SNAP participation to changes in these outcomes. While assessment of the adequacy of SNAP allotments may be based on examining whether program participants appear to be meeting the goals of improving food security and access to a healthy diet, it is not clear what standards should be used to determine whether food security has been sufficiently improved or whether participants truly have access to a healthy diet. For example, what level of food security among participants would be required to determine that SNAP benefits are adequate? Should SNAP benefits be expected to eliminate low and/or very low food security entirely (if both, this would imply that the resulting rate of food insecurity should be zero percent among participants for benefits to be judged adequate)? Or would a more appropriate standard be to expect the rate of low and/or very low food security to be approximately the same among participants as among low-income nonparticipants? And what standards of nutrient adequacy should be expected—perhaps an HEI-2005 score equal to that of nonparticipants?

Key to defining the adequacy of SNAP allotments is having estimates of the impact of these benefits on such outcomes as diet quality, obesity, or food security. However, self-selection into SNAP greatly complicates such estimates. Because individuals and households choose whether to participate in the program if they are eligible, the unmeasured characteristics of participants may differ in important ways from those of nonparticipants. Further, these differences in unmeasured characteristics may be related to key outcomes of interest. Thus, a difference in outcomes between participants and nonparticipants could be due either to differences in their unmeasured characteristics or to the effect of program participation. Although a number of sophisticated methods have been developed to address this challenge, none of these methods is perfect, and critics have challenged their validity.

FINDINGS AND CONCLUSIONS

In assessing the feasibility of defining the adequacy of SNAP allotments, the committee considered a range of evidence on the impact of SNAP program participation on achieving the program goals of improving food security and access to a healthy diet. In general, the committee found that it would be useful to conduct further research examining food security and

access to a healthy diet among program participants and estimating the impact of SNAP benefits on these outcomes.

Food Security

Overall, the evidence on the impact of SNAP participation on food insecurity is moderately strong. While there have been no randomized controlled trials that can shed light on how SNAP affects household food insecurity, the nonexperimental studies reviewed have made serious efforts to account for the possibility of selection bias in their impact estimates. In particular, these studies have used various methods to account for observed and unobserved factors that lead some households to receive SNAP benefits and others not to participate.

The evidence suggests that food insecurity is common among SNAP participants. As discussed above, data from 2011 show that just under half of SNAP households (48 percent) were food secure, with 29 percent having low food security and 23 percent having very low food security. These rates of low and very low food security were nearly twice the rates for income-eligible households that did not participate in the program, 16 percent of which had low food security and 11 percent very low food security. Among higher-income households (those with incomes above 185 percent of the federal poverty threshold), more than 90 percent were food secure.[6] Subgroups for which food insecurity is particularly prevalent include female-headed households with children and African American– and Hispanic-headed households (Coleman-Jensen et al., 2012a).

Although the prevalence of food insecurity is relatively high among SNAP participants, the most recent research suggests that it would be even higher absent SNAP benefits—in other words, that SNAP benefits have positive impacts on participants' food security (i.e., reducing households' likelihood of food insecurity). This finding raises the question of whether the high prevalence of food insecurity among SNAP households could be further reduced with higher benefit levels.

Taken together, the evidence suggests that SNAP benefits help alleviate food insecurity, but not enough to reduce the level of insecurity to that of either higher-income households or lower-income households that do not participate in the program. Evidence is less complete on the levels of food insecurity and impacts of benefits among subgroups of participants.

[6]These statistics are based on the 12-month measure of food insecurity and thus may be influenced by the households' experiences prior to entering SNAP. The patterns of food insecurity based on the 30-day measure were similar to those reported here, although the food insecurity rates were somewhat lower (Coleman-Jensen et al., 2012a).

Access to a Healthy Diet

As discussed above, many SNAP households have diets that are not nutritious in all respects. The committee found that evidence on the question of whether SNAP benefits contribute to improving dietary quality is limited and insufficient to permit drawing conclusions on this question. In addition, significant methodological challenges arise in assessing diet quality in the SNAP population. Along with these challenges, the lack of evidence on this issue may be due to the time lag between receipt of the SNAP benefits and subsequent dietary intake and the failure of many studies to account for selection bias.

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4

Individual, Household, and Environmental Factors Affecting Food Choices and Access

Chapter 3 presented the evidence on relationships between participation in the Supplemental Nutrition Assistance Program (SNAP) and the potential for participants to achieve the program goals of improving food security and access to a healthy diet. This chapter presents evidence on individual, household, and environmental factors that affect food purchasing and consumption decisions and their impact on food choices and access and ultimately on the adequacy of SNAP allotments for achieving those goals. First, however, the chapter describes household food production theory as a framework for the discussion of these factors. After a brief review of the data and analytical challenges to research designed to broaden understanding of the issues facing SNAP participants, the final section presents a summary of findings and conclusions.

It should be noted that, in evaluating the available evidence, the committee determined it would be most useful to examine research questions with a focus on observational studies. This is because randomized controlled trials are infrequent among the types of studies considered. Much of the observational evidence available was cross-sectional, and the findings from these studies were considered in the context of the total available evidence, including that from both observational and experimental studies. All studies reviewed were evaluated by content area, study design, and publication source. Although they were not given equal weight with peer-reviewed publications, some publications from nongovernmental organizations and stakeholder groups also were considered because of the additional insight they provided into the behavioral aspects of participation in nutrition as-

sistance programs. The committee's literature search strategy is described in Appendix D.

HOUSEHOLD PRODUCTION THEORY AS AN ORGANIZING FRAMEWORK

Consumers choose foods for consumption within the context of their own and their household's preferences and available resources. According to basic economic theory, households purchase foods and other market goods to maximize utility, or well-being, based on their preferences and subject to the constraint that the cost of those goods is less than or equal to the sum of all sources of income. However, households are subject not only to an income constraint but also a time constraint. Thus, according to household production theory, households combine time and market goods to produce commodities for consumption in the household (Becker, 1965). In the context of food choices, food consumption requires not only money expenditures for purchasing food but also time expenditures for purchasing, preparing, and consuming food and for cleaning up after preparation and consumption. Therefore, the full price of consumption is the sum of the direct and indirect prices for food, where the direct price is the purchase cost, and the indirect price is the value of the time requirements (Becker, 1965). The Becker model and its extensions help identify the types of individual and household factors that may be relevant in defining the adequacy of SNAP allotments. Furthermore, in the context of SNAP, the allotment is another source of "income" to the household that can be used to purchase food and may free up resources for the purchase of other types of market goods.

A complication of household production theory as it applies to the production of commodities that require both market goods and time is that a household's "technology" determines behavior in addition to its preferences (Pollak, 2011). A household's technology could relate to human capital (e.g., food preparation knowledge) or physical capital (e.g., kitchen equipment). Furthermore, it could relate to the form of the production function transforming ingredients into foods for consumption, such as whether there are economies of scale in food production. Economies of scale relate to the fact that as household size increases, the incremental money and time expenditures for each individual are reduced because meals are prepared jointly, so the resources for acquiring, preparing, and serving are spread over more individuals. These economies of scale factor into the allocation of SNAP benefits based on household size.

Recent research has investigated the trade-off between money expenditure and time expenditure in food production. These studies have found that low-income individuals and households, like those at higher income

levels, are time-constrained for meal preparation. A household needs both sufficient money and sufficient time to prepare healthy meals (Davis and You, 2011). The amount of time individuals spend preparing food for consumption in the household is affected by household and individual factors such as earnings; labor force participation; the number of children in the household; and sociodemographic characteristics such as education, ethnicity, and gender (Mancino and Newman, 2007). Having multiple jobs, inflexible hours, and night work, for example, is associated with limited time for choosing and preparing healthy foods (Devine et al., 2003). In addition, environmental factors such as region of the country and whether an individual lives in a metropolitan area affect food consumption decisions (Mancino and Newman, 2007). Using data from the 2003-2004 American Time Use Survey (ATUS), which is administered by the Bureau of Labor Statistics, Mancino and Newman (2007) found that household time resources have a greater effect than an individual's earnings or household income on how much time is allocated to preparing foods. As described further in the next section, households in which women work full-time or are the single head of household have fewer time resources.

In summary, multiple factors affect a household's ability to transform foods available for purchase into foods that can be consumed. With the exception of foods purchased in prepared form, for example, one or more individuals within the household must have the necessary knowledge and physical ability to prepare foods from ingredients and sufficient time available for all the activities involved in food preparation; moreover, the household must have the necessary equipment to refrigerate, prepare, and cook foods. In addition, food knowledge and choices are strongly influenced by social and cultural preferences of individuals and households. Furthermore, environmental factors affect the types of foods available for purchase, the cost of those foods, and the means of transportation (a personal vehicle, a social network, or public transportation) that can be used to acquire the foods. Thus, the broader context of the theory of household production must address the various factors that influence the theory's application to actual food choices.

INDIVIDUAL AND HOUSEHOLD FACTORS

This section describes individual and household factors affecting the adequacy of SNAP allotments: food choices; the time available for food purchasing and preparation; knowledge, skills, and abilities related to food preparation; and the availability of personal, nonpublic transportation for individuals and households. Implicitly, SNAP allotments are based on assumptions about these factors, and departures from these assumptions for individual participants may affect their ability to purchase healthy foods with their SNAP benefits.

Food Choices

Definition of the adequacy of SNAP allotments for achieving the program goals is closely linked to food choices. As illustrated by the Food Choice Process Model (Sobal and Bisogni, 2009), food choices are strongly influenced by events and experiences beginning early in life and continuing throughout the life course. The following discussion focuses on components of this model that are potentially related to the ability of SNAP participants to achieve the program goals: taste preferences, personal and social factors, employment status, acculturation, and access to personal transportation (which is also considered later in this section as a potential constraint on the access of SNAP participants to healthy foods).

Taste Preferences

Taste preferences often are cited as a primary motivator of individuals' food choices (Drewnowski, 1997; Drewnowski and Levine, 2003; Drewnowski et al., 1999). While preferences for sweet and salty flavor appears to be innate, other preferences are clearly influenced by early exposure. Evidence reviewed by the committee included both social and environmental factors that can influence taste preferences. A review of research on taste preferences includes evidence that foods eaten by a woman during pregnancy and lactation can influence the infant's early flavor experience (Birch, 1999). It is not clear, however, that such exposure has a lasting impact on the infant's subsequent taste preferences, given the number of social and environmental factors that can influence the development of those preferences during infancy and childhood (Birch, 1999; Devine et al., 1999).

Personal and Social Factors

Food deprivation and irregular availability of food during childhood have been found to contribute to the development of poor eating behaviors (e.g., overeating and binging and having an emotional attachment to food), as well as to less healthful food choices in general. Olson and colleagues (2007) propose early food deprivation in childhood and associated attitudes and behaviors toward food as a possible mechanism for the association between childhood poverty and adult obesity.

Food choices also are influenced by personal and cultural ideals, constrained by resources and present contexts. Family structure, including single head of household versus married/partnered heads of household, the presence of children, the health of family members, and the roles of each family member in food choices all influence the household's ability to be food secure and have access to a healthy diet (Devine et al., 1999; Evans

et al., 2011; Wiig and Smith, 2009; Wiig Dammann and Smith, 2009). For example, children and other family members may influence the food decisions of the individual(s) procuring and preparing food to the detriment of the bottom-line cost, as well as the nutritional quality of what is purchased. As financial resources and consequent food security decline, low-income populations increasingly focus on price and quantity instead of preference and quality (Dachner et al., 2010; Wiig Dammann and Smith, 2009). They make use of a variety of family and community resources (Mammen et al., 2009), even resorting to strategies such as attending events where food is offered (e.g., church events), selling or pawning items, and eating discarded and out-of-date foods (Kempson et al., 2003). Specific strategies that impact nutritional quality include giving priority to meat above other foods; limiting fruits and vegetables because of cost and the short shelf life of fresh produce, combined with poorer flavor acceptance of canned varieties; limiting milk because of cost; and consuming more filling starches (Wiig and Smith, 2009). On the other hand, several qualitative studies of low-income women have found that having children has a positive influence on the mothers' consumption of a nutritious diet, such as consuming more fruits and vegetables (Dubowitz et al., 2007), and on their motivation to improve the nutritional quality of their families' diets even though they are constrained by cost and family members' preferences (Evans et al., 2011). Recently, however, Laroche and colleagues (2012) analyzed data from the Coronary Artery Risk Development in Young Adults study to examine whether the percentages of saturated fat and energy intake and the daily intake levels for fruits and vegetables changed when children were present in the home. This longitudinal study of more than 2,500 adults found no relationship between becoming a parent and changes in the household's eating habits, regardless of employment status.

Employment Status

Work life can influence food choices in several different ways. Qualitative and quantitative research by Devine and colleagues (2003, 2009) examining the "spillover" of work into food choices among low- and moderate-wage workers revealed that long hours, inflexible schedules, shift work, and multiple jobs have an impact on the time and energy available for food procurement and preparation. Strategies used by workers for acquiring food under these conditions involved compromises viewed as unsatisfactory for maintaining a healthy diet, such as skipping meals, eating take-out meals, eating away from home, and limiting time to meet family needs and skipping family meals. Those who reported managing well had flexible work schedules, support from others for family responsibilities, and personal resources that included planning and cooking skills. The results

of these studies were confirmed in a much larger cross-sectional study of a population of more than 3,700 diverse parents of adolescents participating in Project F-Eat (Bauer et al., 2012). Full-time working mothers reported spending less time in meal preparation, preparing fewer family meals, and consuming fewer fruits and vegetables. When work-life stress was higher, the outcome was a less healthful food environment overall, exemplified by even fewer family meals and more frequent consumption of fast foods and sugar-sweetened beverages. These effects did not differ between mothers and fathers.

Acculturation

Acculturation among immigrant populations has been shown to be associated with changes in both diet quality and food security (Mazur et al., 2003). Most of this research has been in Latino populations, which have disproportionately high levels of food insecurity (Coleman-Jensen et al., 2012) and in which acculturation among youth appears in part to increase the negative effects of poverty on childrens' diet quality (Mazur et al., 2003).

In a recent study of the impact of acculturation on food security, Dhokarh and colleagues (2011) retrospectively analyzed respondents to the 1998-1999 Acculturation and Nutrition Needs Assessment survey of low-income Puerto Rican households to examine the impact of acculturation and social capital indicators on nutrition and health outcomes. The analysis focused on a convenience sample of women (N = 200) with young children in the Hartford, Connecticut, area who were either SNAP participants or SNAP-eligible. Among study participants surveyed, 76 percent were found to be food insecure. A bivariate analysis found positive associations between food insecurity and being unemployed, not owning a car, having older children, speaking Spanish only, planning to return to Puerto Rico, not attending Latino church or cultural events, receiving SNAP benefits that did not last the entire month, and accessing emergency food assistance. Likewise, a multivariate analysis showed positive associations between being unemployed, single, born in the United States, speaking Spanish only, planning to return to Puerto Rico, not attending Latino church or cultural events, and having SNAP benefits that did not last the entire month. These results illustrate the complexity of the relationship between acculturation and food insecurity in this Latino population. Another cross-sectional study, also in Hartford, examined the differences between low-income pregnant women who were Puerto Rican (N = 243) or non–Puerto Rican Latinas. The Puerto Rican women were more acculturated than the other Latinas and had diets that were higher in fat and sugar and lower in vegetables (Hromi-Fiedler et al., 2012). The presence of acculturation covaried with ethnicity so could not be assessed separately.

A qualitative focus-group study of Special Supplemental Nurition Program for Women, Infants, and Children (WIC)–eligible women who were mothers of infants and were either first-generation immigrants or U.S.-born found differences in attitudes related to food procurement and preparation (Dubowitz et al., 2007). Although there were similarities between the two groups, including time and money constraints on food choices, those born in the United States were more likely to buy prepared foods, including fast foods, and were less likely to travel to shop for foods they wanted. No difference was found in levels of food security, with both groups being marginally food insecure.

As with Latina populations, lack of acculturation was found to be related to food insecurity among mothers with young children who were refugees from Liberia in West Africa (Hadley et al., 2007). In a mixed methods study (15 qualitative interviews followed by a survey of 101 women), food insecurity was higher, at 73 percent, among those who had been in the United States only 1 year than among those who had resided in the United States for 3 years, at 33 percent. Food insecurity generally was negatively associated with measures of acculturation, including perceived difficulty in understanding the language and time in the United States ($p < 0.05$).

Access to Personal Transportation

One additional factor influencing food choice is the availability of personal, nonpublic transportation. Households without a personal vehicle or access to public transportation must rely on alternative means—walking or biking to a store close at hand or social networks (family, friends, neighbors) that provide reliable transport. People with disabilities are particularly at risk, often completely dependent on social networks for access to food. For example, an in-depth qualitative study of food access among 28 low-income rural, village, and inner-city families with disabled primary grocery shoppers found that they relied on social networks for assistance with food shopping (Webber et al., 2007). An unexpected finding in this study was that nearly half of the participants had a variety of health conditions and disabilities that limited their access to food, in particular, healthy, affordable food.

Time

Purchasing and preparing a healthy diet can be a time-intensive process for households that do not use commercially prepared foods. Producing healthy meals requires a number of activities, skills, and resources that include planning, transportation to and from a grocery store or other food outlet, shopping, preparation, and cleanup. Thus, time involving food preparation is particularly relevant to defining the adequacy of

SNAP allotments. The committee identified several studies that found a disconnect between the assumptions of the Thrifty Food Plan (TFP), which is used as the basis for the SNAP maximum benefit, and in turn for SNAP allotments, and resource constraints among low-income households. The TFP market baskets take into account the types and quantities of nutritious foods that can be purchased with the maximum SNAP benefit, but they do not consider time required for food preparation. Davis and You (2010, 2011) analyzed the money and time requirements associated with the TFP. They matched ATUS data with the Food Security Supplement to create a dataset providing total weekly food expenditures and daily time allocations, along with household composition information, for approximately 6,300 single-headed households. They found mean expenditures for food of $107.37 per week and a total amount of time involved in food production of about 4.41 hours per week. Applying a mean price of time of $10.48 per hour, the total mean money-time requirements can be estimated at an average of $178 per week. Thus while actual monetary expenditures are 35 percent greater than required to meet the TFP target, actual expenditures accounting for the cost of time are 40 percent less than the TFP target. Across households in the dataset, 62 percent spent enough to meet the TFP target when only money costs were considered, but just 13 percent did so when time costs were included in the cost calculation.

The TFP provides the potential for an adequate diet and makes allowance for including some commercially prepared foods (Carlson et al., 2007). However, using the Center for Nutrition Policy and Promotion (CNPP) publication *Recipes and Tips for Healthy, Thrifty Meals* (CNPP, 2000), which provides 2 weeks' worth of meals with recipes and preparation times, the average estimated time requirement is 16.1 hours per week or 2.3 hours per day (Davis and You, 2010; Rose, 2007). In their study, Davis and You (2010) included a sensitivity analysis of 8 hours per week to account for different food choices and recipe combinations, consistent with the Economic Research Service (ERS) publication *Who Has Time to Cook?*, which reports that 13-16 hours per week is required for food preparation (Mancino and Newman, 2007).

Household factors also impact the time available for food preparation. Low-income households with either two adults or a single-parent head of household working less than 35 hours per week reported allocating enough time for food preparation to meet the TFP target. However, low-income women working full-time spent too little time in food preparation to meet the TFP's implied requirement of at least 80 minutes per day (Mancino and Newman, 2007).

The time required for each step in the procurement and preparation of food is also affected by household factors and resources, such as the availability of public transportation or ownership of a vehicle; access to food

outlets carrying a variety of healthful foods; the availability of household equipment with which to store (e.g., refrigerator or freezer) and prepare (e.g., range and oven) food; and the knowledge and skills to plan, choose, and prepare foods that meet dietary needs within budgetary limits. While limited data exist on the time costs of this entire process, it is clear that a money-time trade-off is entailed in the preparation step, with convenience foods that are wholly or partially preprepared having a higher monetary cost than foods prepared largely from basic unprocessed ingredients—i.e., from "scratch,"—that require more preparation time (Mancino and Newman, 2007). Available time resources thus affect the choices between commercially prepared and home-prepared foods and potentially the nutritional quality of the diet as well (Beshara et al., 2010; Devine et al., 2003, 2009; Jabs and Devine, 2006). In addition to the general shift to more women in the workforce, Rose (2007) points to several government policies that have specifically promoted employment among low-income women over the last two decades, such as increases in the earned income tax credit. This trend, as well as the increasing number of single-parent households among SNAP participants, has altered the allocation of time resources, decreasing the amount available to spend on food preparation (Mancino and Newman, 2007).

Time use surveys conducted between 1965 and 2000 show a decrease in time spent in food preparation, with less time for working than nonworking women: 4.5 versus 7.9 hours per week, respectively. Nonworking women in food secure households responding to the 1996-1997 National Food Stamp Program Survey reported significantly greater time expenditures relative to this latter figure, an average of 13.9 hours per week (Rose, 2007). In the 2003-2004 ATUS, women working full-time in households at 130 percent or less of the federal poverty level reported 5.4[1] hours per week spent in food preparation and cleanup, compared with 8.2 hours per week for those not working (Mancino and Newman, 2007). Regression models pointed to certain individual and household characteristics that partially explained women's time reported for food preparation and cleanup: having a partner, the number of children in the household, and age were positively associated, whereas having unhealthy adults in the household was negatively associated. Low-income men reported spending less time than women, and low-income men who were not working reported spending twice as much time as men working full-time—3.0 versus 1.5 hours per week, respectively. Having a household partner or a young child was positively associated with time men dedicated to food preparation. Estimating direct food costs and monetizing time costs using the USDA Food Security Supplement and the

[1]To compare across studies, Mancino and Newman (2007) used data in minutes per day that were then converted to hours per week (m/d × 7 d/60 m).

ATUS for 2004 and 2005, time was found to be more constraining than money, with time costs adding about 35 percent to total food costs (Davis and You, 2011). Thus, if labor costs are not included, the real cost of food for low-income households is severely underestimated.

Knowledge, Skills, and Abilities

According to the 2010 *Dietary Guidelines for Americans* (DGA), very few Americans consume diets that meet the DGA recommendations (USDA and HHS, 2010). The complexity of the food and information environments makes it difficult for all consumers to improve their dietary patterns. Contento (2007) makes the case that this complexity calls for nutrition education to give individuals the knowledge and skills necessary to navigate these environments in a way that results in healthful food choices. SNAP participants need to be especially skillful in making choices within the constraints of available resources so they can maximize the purchasing power of their SNAP benefits.

The committee found limited research directly documenting a lack of nutrition and resource management knowledge and skills among low-income populations generally, or among SNAP participants specifically. One cross-sectional study, by Gleason and colleagues (2000), investigated knowledge and attitudes, but not skills. This study, using data from the 1994-1996 Continuing Survey of Food Intakes by Individuals and the Diet and Health Knowledge Survey, found that among adults, factual knowledge about the health consequences of specific dietary practices and which practices are most healthful was lower among low-income (<130 percent of the poverty level) (N = 1,464) than higher-income (N = 4,194) respondents. In addition, no significant differences in knowledge were found between SNAP participants (N = 435) and nonparticipants (N = 1,029). Low-income participants believed that eating a healthy diet (rich in fruits and vegetables, limited in fat and cholesterol) was important, but this belief did not translate into confidence that they were making healthful choices, suggesting a possible lack of the skills needed to translate nutrition knowledge into practice. SNAP participants reported even lower confidence than low-income nonparticipants in the healthfulness of their choices. In regression analyses, knowledge and attitudes did not mediate the relationship between SNAP participation and dietary intake. The food resource management skills of planning, shopping, and preparation are recognized as necessary to translate knowledge into practice (Contento, 2007). However, the study by Gleason and colleagues (2000) did not investigate resource management knowledge and skills and how they would impact dietary intake and food security in the context of resource constraints. The authors do conclude that their study provides "circumstantial

evidence that there is a role for increasing nutrition education and promotion among participants" (p. 155).

In addition to knowledge, several studies point to the effect of perceptions of time pressure or self-efficacy as related to meal preparation, factors that are at least somewhat modifiable by nutrition education. For example, a random digit dial survey (N = 458) of meal preparers found a negative effect on diet quality of respondents' perceptions of time pressure as related to meal preparation that was moderated by self-reported knowledge of nutrition, along with years of formal education and perceptions of health risk (Mothersbaugh et al., 1993). More recently, Beshara and colleagues (2010) investigated the effects of perceived time pressure and other related variables on the healthiness of meals served over a 7-day period to school-aged children in Australia. Among the 120 mothers surveyed, no significant relationship was found between perceived time pressure and healthiness of meals. The study did find, however, that mothers' self-confidence in their ability to prepare healthy meals was predictive of dietary quality. The authors point to social cognitive theory (Contento, 2007), which provides a theoretical basis for much of the community-based nutrition education provided to low-income audiences.

Federally Funded Nutrition Education

USDA provides funding for several programs focused on improving nutrition knowledge and skills either as the sole purpose (e.g., the Expanded Food and Nutrition Education Program [EFNEP]) or in conjunction with nutrition assistance programs (e.g., SNAP-Education [SNAP-Ed]). Both of these educational initiatives (described in Box 4-1) aim to enhance participants' ability to meet the recommendations of the DGA. Both use theory-guided interventions that take into account participants' existing strengths and emphasize building skills for resource management through planning meals and shopping wisely so as to use both nutrition assistance program benefits and cash to make healthy food choices (FNS, 2012; NIFA, 2009a). Food preparation skills are included to teach participants how to provide food with less reliance on more expensive convenience and fast foods.

More evaluation studies have been done of EFNEP than of SNAP-Ed, partly because EFNEP is an older program, beginning nationally in 1969, 20 years before the establishment of SNAP-Ed. Studies evaluating the effectiveness of EFNEP can be applied to assessments of SNAP-Ed for several reasons: The target populations are similar; the objectives are similar; and EFNEP is delivered solely through the Land Grant University Cooperative Extension System, the same system that delivers the largest number of SNAP-Ed programs across the country, generally using the same curricula and approaches (NIFA, 2009b).

BOX 4-1
SNAP-Related Federally Sponsored Nutrition Education Programs

Expanded Food and Nutrition Education Program

The Expanded Food and Nutrition Education Program (EFNEP), sponsored by U.S. Department of Agriculture and delivered through the Land Grant University Cooperative Extension System, is a program designed to help those with limited resources acquire the knowledge, skills, attitudes, and behaviors needed to develop and improve the diet and nutritional well-being of themselves and their families. As a component of the program, participants learn how to make food choices to improve the nutritional quality of the meals they serve; how to increase their ability to select and buy food that meets the nutritional needs of their family; how to gain new skills in food production, preparation, storage, safety, and sanitation; and how to better manage their food budgets and related resources.

SNAP-Ed

The Supplemental Nutrition Assistance Program-Education (SNAP-Ed) is a federal-state partnership program, sponsored by USDA, that supports nutrition education for SNAP participants. It provides educational programs and social marketing campaigns to increase the likelihood that participants will make healthier food choices within their budget constraints and will choose active lifestyle habits consistent with the recommendations of the *Dietary Guidelines for Americans*.

EFNEP has an evaluation system that has allowed for evaluation of the national program (NIFA, 2012) and has been recognized by the Government Accountability Office (GAO) for its ability to show how program goals are met (GAO, 2004). Outcome data resulting from ongoing evaluation, as well as research studies over time, have shown positive changes in nutrition practices and improvements in food security among graduates of EFNEP. Studies of the program's effects include randomized controlled trials (e.g., Burney and Haughton, 2002; Cason and Logan, 2006; Townsend et al., 2006), quasi-experimental studies (e.g., Cason et al., 2005; Cox et al., 2003; Del Tredici et al., 1988) and observational studies (Arnold and Sobal, 2000; Bergman, 1997; Dickin et al., 2005; Dollahite et al., 2003, 2008). Researchers and educators also report positive changes as a result of participation in SNAP-Ed through randomized controlled trials (e.g., Eicher-Miller et al., 2009; Foster et al., 2008; Keihner et al., 2011), quasi-experimental studies (e.g., Backman et al., 2011; Gabor et al., 2012; Joy et al., 1999), and observational studies (Bell et al., 2006; Ellis et al., 2005; e.g., Hersey et al., 2001). Nevertheless, government reports have indicated that the process of evaluating SNAP-Ed needs improvement (GAO, 2004; Guthrie et al., 2006).

Nutrition education interventions, such as those delivered through SNAP-Ed, vary dramatically in terms of participants' age, gender, and cultural background and the contextual factors that impact participants' ability to both engage in and benefit from the interventions. In addition, interventions differ greatly in the specific behavioral objectives targeted, the educational dose administered, and the approach employed (e.g., direct education with and without changes in the surrounding food and activity environment; whether the intervention is delivered by professional nutritionists or trained paraprofessionals), thus making an overall assessment of the effectiveness of nutrition education challenging. Moreover, while each of the studies cited above reports at least some positive results of these interventions, each has weaknesses in study design and/or assessment of outcomes. For example, the intensity of interventions studied varies dramatically, and the committee found no studies assessing the educational dose needed to elicit positive outcomes.

Only one study (Arnold and Sobal, 2000) included longitudinal data to assess the retention of behavior change over time—in this case, 1 year postintervention—but this was an observational study with no control group, and data were collected by the staff providing the nutrition education. Only two studies included biological measures, with both showing significant improvements with education. The first was an intensive school-based intervention (kindergarten through eighth grade) that included 50 hours of classroom nutrition education plus changes in school food policy, social marketing, and parent outreach (Foster et al., 2008). At the end of 2 years, the incidence of overweight in children in the intervention schools was significantly lower than that in the control schools. A second study found a significantly lower incidence of low birth weight among the population receiving nutrition education, but outcomes were compared with the local population as a whole rather than with a control group (Bergman, 1997). All other studies assessed the impact of the interventions through self-reports, with few including measures of convergent validity, such as consistency between reported behavior and dietary recall data; among those that did report multiple outcome assessments, results were consistent in some (e.g., Burney and Haughton, 2002; Keihner et al., 2011) and inconsistent in others (e.g., Arnold and Sobal, 2000). In addition, mediators and moderators of behavior change have infrequently been reported.

The report of Wave 1 of a Food and Nutrition Service (FNS) independent impact evaluation of four SNAP-Ed demonstration projects—three focused on children and one on women—was recently released (Gabor et al., 2012). No statistically significant impacts were seen across the projects for the common primary outcome variable of increased average daily fruit and vegetable consumption, although one project resulted in significantly

increased at-home intakes of vegetables among children. In addition, a number of secondary outcomes that varied by project were significantly better with education; for example, children were more willing to try fruits and vegetables and more likely to initiate eating vegetables as snacks.

In summary, the available data indicate that nutrition education has some positive impacts on food choices and food security. However, the body of evidence has limitations and is missing key components for understanding what is necessary to provide cost-effective nutrition education.

Availability of Food Preparation and Storage Equipment

The committee reviewed evidence on the impact of having the food storage and preparation equipment and appliances needed to prepare a healthy diet that could be purchased with SNAP benefits, consistent with the assumptions of the TFP. The committee found a paucity of research studies measuring the impact of a lack of food storage and cooking equipment in homes on the ability to prepare healthy meals. In a study of housing quality among 186 Latino farm-worker families in six North Carolina counties, Gentry and colleagues (2007) found that many lacked functional appliances, including ovens (27 percent), refrigerators (8 percent), and stoves (5 percent). By contrast, in a study of SNAP applicants in three Oklahoma counties (rural, suburban, and urban), Landers and Shults (2008) found that more than 97 percent of homes surveyed had adequate equipment for cooking. One additional study examined the ability of homeless families living in temporary housing with limited or no cooking and storage equipment to prepare healthy meals (Landers and Shults, 2008). The study found that not having adequate food preparation equipment resulted in the families resorting to consuming more unhealthy foods, such as sweetened beverages, candy, cookies, and chips.

Access to Personal, Nonpublic Transportation

Access to transportation was discussed above as a factor to consider for its impact on individual food choice decisions. Personal transportation is considered here as an individual/household factor that could have an impact on the purchasing power of SNAP allotments by constraining the ability of SNAP participants to access healthy foods.

A 2009 report to Congress by USDA indicates that 23.5 million Americans were living in low-income areas that were also more than 1 mile from a supermarket or large grocery store (Ver Ploeg et al., 2009). Based on this evidence, the committee examined the impact of individuals' or households' access to a personal vehicle or to a reliable vehicle as a factor in the feasibility of defining the adequacy of SNAP allotments. The committee identified

a number of studies examining whether a lack of transportation is a significant barrier to access to supermarkets or large grocery stores that provide a range of healthy foods. The committee also examined evidence on whether access to personal transportation is modified by race/ethnicity, age, medical conditions, and other factors affecting low-income populations.

In one of the most comprehensive reviews of U.S. studies on neighborhood disparities in food access, Larson and colleagues (2009) found that neighborhood residents with better access to supermarkets and limited access to convenience stores tend to have healthier diets and reduced risk for obesity. On the other hand, those residing in "food deserts"[2]—especially those without transportation—may be limited to shopping at small neighborhood convenience and corner stores, where fresh produce, low-fat food items, and other healthy foods are often limited and of poor quality (Andreyeva et al., 2008). In a study of focus groups of low-income women in Minneapolis who were predominantly SNAP users, Wiig and Smith (2009) found that store accessibility was a major factor in shopping frequency because many households did not own a vehicle.

Feather (2003) assessed the impact of changes in store access policies on SNAP recipients. His modeling of price, selection, quality, and accessibility costs revealed that, depending on transportation and store proximity, increased access to a new grocery store resulted in a monthly gain of $2.78 to $7.76 per SNAP participant. Rose and Richards (2004) conducted a secondary analysis of a nationally representative sample of households participating in the Food Stamp Program using data from the 1996-1997 National Food Stamp Program Survey. The study analyzed distance to store, travel time to store, ownership of a car, and difficulty of supermarket access as variables associated with the household's use of fruits and vegetables. Most households surveyed (76 percent) had easy access to a supermarket, even though the majority of households did not own a car. Among survey participants who lived more than 5 miles from their principal food store, however, fruit consumption was significantly below that of those who lived within a mile of their principal store.

Laraia and colleagues (2004) investigated the association between distance to the closest supermarket and a composite measure of diet among pregnant women. While they do not specifically mention study participants' lack of personal transportation, their findings suggest that a woman's food environment, as measured by distance to supermarkets, grocery stores, and

[2]The concept of a "food desert," defined by USDA as "low-income urban areas that are more than one mile from a supermarket and low-income rural areas that are more than ten miles from a supermarket" (ERS, 2012), lacks a consistent definition in the broader literature. Some define it by the quality of available foods, while others define it as the quantity of available foods. There is no consensus on the best or most appropriate definition, nor is there agreement on the existence of food deserts (Bitler and Haider, 2011).

convenience stores, directly influences diet quality during pregnancy. Living more than 4 miles from the closest supermarket is most strongly associated with poor diet quality, even after controlling for individual socioeconomic characteristics and the availability of grocery and convenience stores.

In a study of Latino neighborhoods in upstate New York, Lopez-Class and Hosler (2010) found that the lack of supermarkets, fewer stores with access for those with physical disabilities, and the lack of public transportation left Latino residents without a vehicle and those with physical disabilities with few food shopping options. Those with physical disabilities or debilitating chronic illnesses were likely to encounter difficulties accessing food stores in their own community because of a lack of stores with disability access features. All supermarkets in the study were located outside the Latino neighborhood, well beyond pedestrian access. Residents in the Latino neighborhood experienced difficulties reaching a supermarket if they lacked personal transportation because public transportation was very limited. The end result was that the residents had to rely on small neighborhood stores with higher prices and fewer choices for some items.

Residents of rural areas must either own or have access to reliable transportation to access healthy food. The findings of Sharkey and Horel (2008) confirm that rural residents have overall low potential access to supermarkets, which is of particular concern given that greater distance from a supermarket has been associated with the lowest diet quality (Laraia et al., 2004; Powell et al., 2007). Spatial inequality experienced by rural low-income families may be exacerbated by mobility and time constraints—including time spent commuting to work, lack of or limited access to transportation, or not being able to afford the cost of transportation (Blanchard and Lyson, 2002; Clifton, 2004; Kaufman, 1999; Powell et al., 2007). Sharkey and colleagues (2010) combined data from the Brazos Valley Food Environment Project, which included identification and geocoding of all food stores (N = 185) in six rural counties in Texas, with 2000 U.S. census data for 101 census block groups to examine neighborhood access to fruits and vegetables. In contrast with other studies, such as those of Zenk and colleagues (2005) and Morland and colleagues (2007), they found that neighborhoods considered highly deprived had better spatial access to supermarkets, grocery stores, convenience stores, and discount stores than less deprived areas. This was the case both for distance to the nearest food source and number of opportunities to get there. Taken together, the evidence reviewed by the committee suggests that among low-income households, greater distances to major food outlets are more likely than shorter distances to be associated with limited food choices and fewer purchases of healthy foods.

ENVIRONMENTAL FACTORS

The committee examined evidence for the impact of various environmental factors on the feasibility of defining the adequacy of SNAP allotments. The range of available evidence included specific environmental factors affecting food choices: food prices; access to food outlets offering a wide range of healthy foods; and disparities in access, particularly in transportation. The committee notes that relevant data collection is ongoing but the data are not yet available through the ERS National Household Food Acquisition and Purchase Survey. When completed, this survey will provide detailed information on household food purchases and acquisitions, including foods purchased for consumption at and away from home and foods acquired through public and private food and nutrition assistance programs. This dataset will be useful for a broad range of economic analyses of food choices and for understanding the implications of food choices for diet quality.

Food Prices

Access to food varies substantially across households because of the various factors affecting food prices. These factors include a number of environmental dimensions, such as geographic region of the country; urban versus rural setting; types of stores available (e.g., supermarkets, convenience stores, mass merchandisers, warehouse club stores); and types of foods available, such as healthier versus less healthy and degree of processing (e.g., raw ingredients, processed ingredients, processed foods, fully prepared foods). Over time, food prices are influenced by changes in costs, due largely to inflationary factors, for farm-level inputs and production, transportation at each stage of production, food processing, and food distribution, which may result in greater or lesser changes than in overall prices for all goods and services. Considering food prices as a component of the evidence needed to define the adequacy of SNAP allotments is important because the influence of food prices on the likelihood of food insecurity is both positive and significant; an increase of one standard deviation in the price of a food basket based on the TFP results in increases in food insecurity of 2.4 percentage points for adults and 3.7 percentage points for children (Gregory and Coleman-Jensen, 2011). In the following discussion, the committee describes the differences in food prices across several dimensions and changes in food prices over time in the context of how these patterns affect food access as a factor in defining the adequacy of SNAP allotments.

Geographic and Regional Variation in Food Prices

Food prices vary across geographic regions of the United States because of differences in the cost of living and other market conditions (Todd et al., 2010). The ERS Quarterly Food at Home Price Database is based on 2006 Nielsen Homescan data and can be used to examine differences in food prices across regions. It is preferred to the Bureau of Labor Statistics' (BLS's) Consumer Price Index (CPI) because the CPI is available only for a limited number of food items and four broad regional markets (Todd et al., 2010). Using 2006 Nielsen Homescan data from the ERS Quarterly Food at Home Price Database, Todd and colleagues (2010) show that the average prices per 100 grams across 50 food categories and 35 market regions differed by 125 percent to 217 percent in the highest-cost versus the lowest-cost region (see Table 4-1).[3] The smallest price difference identified was for canned soups, sauces, and prepared foods, while the largest price difference was for low-fat cheese. In general, grain-based foods, prepared foods, snack foods, and carbonated beverages appeared to have smaller price differences than fruits and vegetables, dairy foods, and meat and poultry. For particular types of foods, the ratio of the average price to the national average varied substantially across market regions. For example, as shown in Table 4-2 for low-fat milk, the average price per 100 grams was 73 percent of the national average for the full sample in Salt Lake City but 129 percent of the national average in urban New York. For purchases made by low-income households in the Nielsen Homescan sample (income below 185 percent of the poverty level), the corresponding ratios ranged from 66 percent to 133 percent across the same market regions. Across the sample of other food categories examined in the report (canned fruit, packaged whole grains, eggs, and carbonated beverages), the lowest relative prices were generally 70 to 90 percent of the national average, while the highest relative prices were generally 120 percent to 140 percent of the national average. Overall, the ranges appeared to be similar for the full Homescan sample and the low-income portion of the sample, with generally similar rankings by market group. However, some of the differences in average prices across regions and across income levels could be due to differences in the level of quality of foods purchased.

Like Todd and colleagues (2010), Leibtag and Kumcu (2011), using Nielsen Homescan data, found substantial price variation by region of the country when examining more disaggregated data for fresh fruits and

[3]Homescan data for 2006 were used because this was the most recent year for which a portion of the Nielsen Homescan panel reported random-weight food purchases (which applies particularly to fruits, vegetables, meat, poultry, and fish) in addition to Universal Price Code (UPC) food purchases. Since 2007, the Homescan panel has recorded only UPC food purchases at the detailed level.

TABLE 4-1 Range in Market Group Prices for Selected Food Groups, First Quarter 2006

Food Group	Minimum Price	Maximum Price	Max. as % of Min.
	$ per 100 grams		
Fresh and frozen fruit	0.229	0.422	184.1
Canned fruit	0.237	0.385	162.4
Fruit juice	0.146	0.223	152.3
Fresh and frozen dark green vegetables	0.259	0.399	154.0
Fresh and frozen orange vegetables	0.202	0.302	149.7
Fresh and frozen starchy vegetables	0.176	0.277	157.3
Canned legumes	0.116	0.208	178.7
Whole grain bread, rolls, rice, pasta, and cereal	0.429	0.540	125.8
Refined grain bread, rolls, rice, pasta, and cereal	0.335	0.467	139.7
Low-fat milk	0.067	0.124	185.9
Low-fat cheese	0.432	0.938	217.2
Fresh and frozen regular-fat meat	0.598	0.906	151.4
Fresh and frozen poultry	0.468	0.856	182.9
Fresh and frozen fish	0.891	1.506	169.1
Eggs	0.143	0.250	174.6
Nonalcoholic carbonated beverages	0.075	0.104	138.5
Noncarbonated caloric beverages	0.095	0.160	168.4
Packaged sweets and bakery goods	0.803	1.463	182.3
Ready-to-eat bakery items	0.399	0.652	163.3
Frozen entrees and sides	0.590	0.784	133.0
Canned soups, sauces, and prepared foods	0.226	0.283	125.4
Packaged snacks	0.709	1.025	144.5

SOURCE: Todd et al., 2010. ERS calculations using 2006 Quarterly Food-at-Home Price Database.

vegetables for 2004-2006. As shown in Table 4-3, the average prices for fruits and vegetables differed by 12 percent (green beans) to 140 percent (watermelons) between the lowest- and highest-cost regions. The minimum prices were at least 11 percent below the national average price, while the maximum prices were up to 47 percent above the national average price. Aggregated across the 20 categories of fresh fruits and vegetables, prices were lowest in the Metro South 2 region, comprising Nashville, Birmingham, Memphis, and Louisville, and highest in San Francisco (see Table 4-4). According to Leibtag and Kumcu's (2011) analysis, these differences in prices across regions have substantial implications for the purchasing power of benefits provided by nutrition assistance programs.

TABLE 4-2 Price Variations Across Market Groups, Full Sample Versus Low-Income Sample, Low-Fat Milk (Food Group 23), 2006 Nielsen Homescan Data

Full Sample		Low-Income Sample	
Market Group	Price Relative to National Mean (%)	Market Group	Price Relative to National Mean (%)
Salt Lake City	72.8	Salt Lake City	65.6
Non-Metro East North Central	80.3	Metro Ohio	81.8
Metro Ohio	81.5	Non-Metro East North Central	82.1
Metro Midwest 1	82.4	Metro Midwest 1	82.6
Western New York/Pennsylvania	83.4	Metro Mountain	84.0
North Pacific	86.7	Non-Metro Pacific	84.2
Chicago	87.3	Western New York/Pennsylvania	86.0
Non-Metro West North Central	88.2	Chicago	87.4
Metro Mountain	89.0	North Pacific	87.7
Metro Midwest 2	89.2	Non-Metro Mountain	88.0
Metro South 3	93.7	Metro Midwest 2	90.7
Non-Metro Pacific	94.4	Metro South 3	91.5
Metro South 2	94.7	Non-Metro West North Central	92.5
Non-Metro Middle Atlantic	97.9	Metro South 2	96.2
Non-Metro Mountain	98.0	Boston	100.9
Philadelphia	105.6	Non-Metro West South Central	104.5
Non-Metro West South Central	106.3	Metro South 4	105.4
Non-Metro South Atlantic	106.3	Non-Metro East South Central	105.7
Metro South 4	106.6	Non-Metro New England	105.7
Boston	107.1	Philadelphia	106.0
Non-Metro New England	107.6	Other New York	106.1
Non-Metro East South Central	108.5	Washington, DC	108.9
Washington, DC	110.6	San Francisco	110.6
Baltimore	111.4	Hartford	110.7
Other New York	111.4	Metro California	112.5
San Antonio	111.6	Atlanta	113.3
Atlanta	111.8	North Florida	113.9
Metro California	111.9	Baltimore	114.2
Los Angeles	112.9	South Florida	116.2
North Florida	113.6	Non-Metro South Atlantic	116.4
San Francisco	115.1	Metro South 1	117.2
Hartford	115.5	Los Angeles	117.5
South Florida	116.8	San Antonio	118.8
Metro South 1	117.7	Non-Metro Middle Atlantic	122.5
Urban New York	128.7	Urban New York	131.4

NOTES: National mean prices are weighted and calculated separately for each sample; low-income households have income below 185 percent of the federal poverty level.
SOURCE: Todd et al., 2010. ERS calculations using 2006 Quarterly Food-at-Home Price Database.

TABLE 4-3 Market Prices for the 20 Most Popular Fruits and Vegetables, with Deviation of Their Minimum and Maximum Prices from the National Average, 2004-2006

Fruit/Vegetable	National Average of Market Prices per Pound	Minimum Market Price per Pound	Maximum Market Price per Pound	Difference from Minimum to Maximum	Difference from National Average to Minimum	Difference from National Average to Maximum
	$			%		
Tomatoes	1.66	1.42	1.98	39	–15	19
Onions	1.33	0.95	1.68	77	–29	26
Lettuce	1.01	0.89	1.17	30	–11	16
Green beans	0.96	0.59	1.31	12	–38	36
Corn	0.89	0.74	1.11	50	–17	25
Carrots	1.18	0.99	1.38	39	–16	17
Broccoli	1.34	1.10	1.61	46	–18	20
Cucumbers	1.02	0.81	1.33	64	–21	30
Peppers	1.72	1.18	2.35	100	–32	37
Cabbage	0.52	0.42	0.70	68	–20	34
Bananas	0.49	0.40	0.62	55	–19	26
Apples	1.10	0.98	1.24	27	–12	12
Watermelon	0.87	0.49	1.19	140	–43	37
Oranges	0.85	0.72	1.25	73	–15	47
Grapes	1.51	1.31	1.70	30	–14	12
Strawberries	2.41	2.15	2.86	33	–11	19
Peaches	1.13	0.95	1.40	47	–15	25
Pineapples	1.29	0.99	1.63	65	–23	26
Pears	1.06	0.94	1.18	26	–11	12
Grapefruit	0.98	0.78	1.24	60	–21	27

SOURCE: Leibtag and Kumcu, 2011.

Urban Versus Rural Food Prices

The data in Table 4-2 also provide evidence of differences in prices by urban versus rural areas. Higher costs in urban areas may reflect the higher costs of operating retail establishments in those areas and the fact that urban communities are often served by smaller stores with higher prices (Stewart and Dong, 2011). For example, prices for low-fat milk in non-metropolitan East North Central (80.3 percent relative to the national mean) are lower than those in the corresponding metropolitan areas in the same region: metropolitan Ohio (81.5 percent); metropolitan Midwest comprising Indianapolis, Detroit, Milwaukee, and Grand Rapids (82.4 percent); and Chicago (87.3 percent). Prices for low-fat milk in non-metropolitan New England (107.6 percent relative to the national mean) are lower than those in the corresponding metropolitan area of Hartford (115.5 percent)

TABLE 4-4 Index Ranking of Markets from Lowest to Highest Prices for the 20 Fruits and Vegetables Most Frequently Purchased by U.S. Households, 2004-2006

Aggregate Market Group	Index Ranking
Metro South 2	90.8
Metro Ohio	91.9
Salt Lake City	92.2
Metro Mountain	92.8
Metro South 3	93.8
San Antonio	93.8
Metro Midwest 1	95.0
Chicago	95.3
Metro South 4	95.4
Urban New York City	96.3
Metro Midwest 2	96.4
Los Angeles	97.4
Western New York/Pennsylvania	98.1
Metro Northwest	99.9
National average	100.0
Atlanta	101.1
Metro California	101.7
Mid-Atlantic	102.2
Other New York City	103.4
Boston	103.8
Philadelphia	103.9
North Florida	104.4
South Florida	104.7
Baltimore	108.8
Washington, DC	110.9
Hartford-New Haven	111.9
San Francisco	113.9

SOURCE: Leibtag and Kumcu, 2011.

but similar to those in the metropolitan area of Boston (107.1 percent). Generally, patterns of lower prices in non-metropolitan areas were found across the other food categories examined (canned fruit, packaged whole grains, eggs, and carbonated beverages). Stewart and Dong (2011) found similar results using data from the Nielsen Homescan panel for 2006, which showed that prices paid by households in urban areas for fresh vegetables and salty snacks were significantly higher than those in non-urban areas.

Food Prices by Store Type

Households acquire food for use at home from a broad variety of stores and outlets (see Box 4-2), including traditional supermarkets and grocery

BOX 4-2
Types of Food Stores and Outlets

Supermarket: Encompasses establishments commonly known as supermarkets, food stores, and food warehouses engaged primarily in the retail sale of an extensive variety of grocery and other store merchandise. This type of store typically has 10 or more checkout lanes with registers, bar code scanners, and conveyor belts. Customers normally make large-volume purchases.

Grocery store: A store that carries a selection of all four staple food categories (i.e., fruits and vegetables; meat, poultry, or fish; bread and cereal; dairy products). This type of store may sell items ineligible for purchase with SNAP benefits as well, but its primary stock is food items. These stores can be categorized as large, medium, or small depending on the size of the selection of items in the four staple food categories.

Convenience store: A self-service store that offers a limited line of convenience items and is typically open for long hours to provide easy access for customers. This type of store is engaged primarily in the retail sale of a variety of canned goods, dairy products, prepackaged meats, and other grocery items in limited amounts. It usually sells a large variety of SNAP-ineligible products such as hot coffee, alcohol, or tobacco products.

Combination grocery/other: A store whose primary business is the sale of general merchandise but that also sells a variety of food products. Such stores include independent drugstores, dollar stores, and general stores.

Supercenter/chain store: A very large supermarket, "big box" store, super store, or food warehouse engaged primarily in the retail sale of a wide variety of grocery and other store merchandise. This category includes stores that are large food/drug combination stores and mass merchandisers under a single roof, as well as membership retail/wholesale hybrids offering a limited variety of products in a warehouse-type environment.

Farmers' market: A single- or multistall market that sells agricultural products, particularly fresh fruits and vegetables, to the general public. This designation applies to any organization that operates a farmers' market location.

Specialty food/gourmet store: A store that operates in a fixed or semipermanent location whose primary business is the sale of meat/poultry products, seafood, fruits and vegetables, or baked goods. It may sell nonfood items or other food items, but such products are incidental to the primary specialty food stock.

SOURCE: Personal communication, Benefit Redemption Division, USDA, September 12, 2012.

stores; convenience and combination grocery stores (e.g., drug stores), mass merchandisers or supercenters and warehouse club stores, farmers' markets, and specialty and gourmet food stores. Over time, there has been a trend for a larger portion of food purchases to be made in stores other than traditional supermarkets (Leibtag, 2005).

Prices vary across types of stores, and thus the types of stores accessible to households affect their total food budgets and ability to acquire healthy foods. In particular, greater access to large grocery stores in suburban than in inner-city and rural areas may result in the poor paying higher prices for food (Andreyeva et al., 2008). In an extensive comparison of food prices at nontraditional discount stores[4] and traditional food stores, Leibtag and colleagues (2010), using 2004-2006 Nielsen Homescan data, found that national average unit prices (total price divided by product weight) were significantly lower in nontraditional stores for 86 percent of food products at the broadest level of comparison. At the Universal Price Code (UPC) comparison level, 82 percent of products had significantly lower prices in nontraditional stores, with an average price discount of 7.5 percent. Meat products had the largest price discounts at nontraditional stores. Furthermore, all canned products had significantly lower prices in nontraditional stores on average. With respect to specific markets, those with more nontraditional stores had smaller differences in prices between those stores and traditional stores, which could be due to increased competition or the exit of traditional stores in markets with a large number of nontraditional stores (Leibtag et al., 2010).

In studies focused on specific areas, food prices were also found to differ substantially across store types. In a study of six neighborhoods in New Haven, Connecticut, Andreyeva and colleagues (2008) found that prices in 2007 were 51 percent higher on average in small neighborhood stores than in supermarkets across 622 food items. In another analysis, Andreyeva and colleagues (2008) constructed a representative basket of food items from 75 stores to compare prices across types of stores (convenience versus grocery, including small neighborhood grocery stores) and neighborhoods (low-income versus high-income). Results indicated that the average price of the market basket was about 4 percent higher in higher-income neighborhoods and also about 4 percent higher in convenience stores than in grocery stores; thus, the authors conclude that price differences across neighborhoods and store types are relatively modest. In a study of food prices in 77 stores in a rural South Carolina county, Liese and colleagues (2007) found that prices of selected foods were substantially higher in convenience stores than in supermarkets (greater than $2 million in annual sales) and grocery stores (less than $2 million in annual sales). The differences were statisti-

[4]Defined as supercenters, mass merchandisers, wholesale club stores, and dollar stores.

cally significant for apples, packaged bacon, packaged smoked turkey, canned salmon, canned tuna, low-fiber breakfast cereals, whole milk, and low-fat/nonfat milk.

Prices of Healthy Versus Unhealthy Foods

Whether healthy foods are found to be more expensive than less healthy foods may depend on how both "healthy" and the units of measure are defined (Carlson and Frazao, 2012; Lipsky, 2009). Numerous studies have examined whether healthy foods are more or less expensive than less healthy foods, using either secondary data available across a broad range of foods or data collected from specific stores for a more limited set of foods. While some argue that nutritious diets of whole grains, lean meats, and fresh vegetables and fruits are affordable, others believe that energy-dense foods (i.e., with more calories per serving) are less expensive (Drewnowski, 2010; Drewnowski and Eichelsdoerfer, 2010; Drewnowski and Specter, 2004; Monsivais et al., 2010). For example, Monsivais and colleagues (2010) linked longitudinal retail price data for 378 foods and beverages in Seattle for 2004-2008 with energy density (kcal/g) and two measures of nutrient density—the Naturally Nutrient Rich (NNR) score, which is the sum of the percent Daily Values (DV) per 100 kcal for 16 nutrients, and the Nutrient Rich Food Index, which is based on the levels of nine positive and three negative nutrients relative to calories. They found that the mean cost of the most nutrient-dense foods (those with high positive nutrients and low negative nutrients relative to calories) were substantially higher and increasing more rapidly than the mean costs of the least nutrient-dense foods.

A recent analysis by Carlson and Frazao (2012) defines a healthy food as one that contains at least half the portion size defined by the 2010 DGA in at least one of the major food groups and has only a moderate amount of saturated fats, added sugars, and sodium. Their analysis examines the price per calorie, per edible gram, and per average portion consumed using the CNPP food prices database based on 2003-2004 Nielsen Homescan data as the source of prices. The authors found that foods high in calories tend to have a lower price per calorie than foods lower in calories. As shown in Figure 4-1, while vegetables have the highest price per 100 calories, they have the lowest price on the basis of price per 100 edible grams or per average portion. Dairy products have the lowest price per 100 calories but one of the highest prices on a 100 edible grams basis. "Moderation" foods, which are defined primarily as those high in sodium, added sugars (including sugar-sweetened beverages), or saturated fat, have a relatively low price per 100 calories but a relatively high price on an average portion basis. Thus, Figure 4-1 shows that comparisons of the costs of healthy versus unhealthy foods can be misleading if expressed on the basis of 100 calories

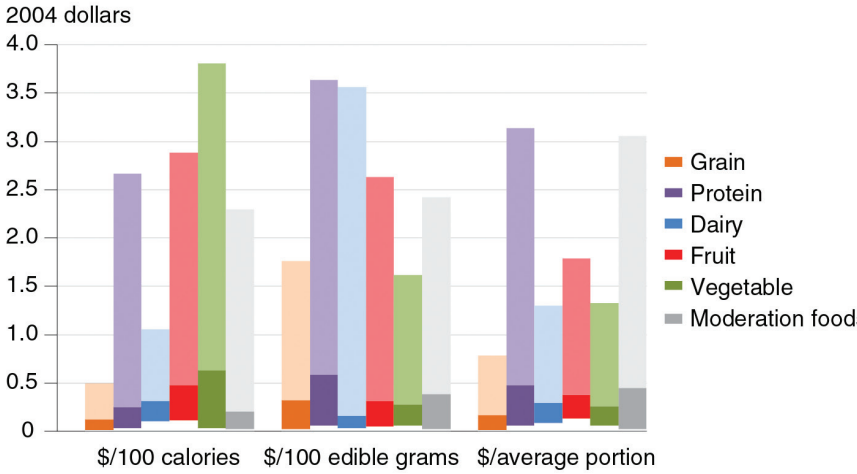

FIGURE 4-1 Prices of healthy versus less healthy foods vary with the measurement method.
NOTES: The dark areas of each bar represent the price range for the less expensive half of the foods in the category, while the lighter areas are the price ranges for the higher-cost foods. White space at the bottom of the bars represents the start of the price range. Moderation foods are foods that are high in sodium, added sugars, or saturated fat or that do not contain foods from a food group.
SOURCE: Carlson and Frazao, 2012.

(and 100 edible grams) because many healthy foods have fewer calories per serving (and per 100 grams) than unhealthy foods. Most important, on a per-serving basis, grains, dairy products, fruits, and vegetables, cost less than moderation foods.

Todd and colleagues (2011) examined differences in prices of a selected set of healthy foods relative to their less healthy counterparts by geographic region using the ERS Quarterly Food at Home Price Database for 1998 through 2006 and found mixed results by food type and region. For some foods, such as whole grains compared with refined grains and fresh and frozen dark green vegetables compared with starchy vegetables, the healthier version was more expensive in all geographic regions. For other foods, such as orange vegetables compared with starchy vegetables and skim and 1 percent milk compared with 2 percent and whole milk, the healthier version was less expensive than the less healthy version in some geographic areas. The magnitudes of the price differences for healthier versions of foods varied substantially across the country.

In addition to the studies discussed above, other studies have examined the prices of healthier food alternatives based on the prices of foods avail-

able in stores in specific areas. For example, Jetter and Cassady (2006) collected price data from 25 stores in Los Angeles and Sacramento for September 2003 through June 2004 and calculated the average cost of a standard market basket based on the TFP versus the average cost of a healthier market basket. Because of the higher costs of healthier foods such as whole grains, lean ground beef, and skinless poultry, the average cost of the healthier market basket was $230, compared with $194 for the TFP market basket. Using similar data for a longer time period, Cassady and colleagues (2007) estimated that a low-income family would need to devote 43 percent to 70 percent of its food budget to fruits and vegetables to meet the 2005 DGA, thus indicating the high price of fruits and vegetables relative to other foods. Because of their relatively high costs, discounts on fruits and vegetables might result in fairly substantial increases in consumption (Dong and Lin, 2009). In a separate study of food prices in 77 stores in a rural South Carolina county in 2004, Liese and colleagues (2007) found that the prices of more healthful versions of foods were higher than those of the less healthful versions, with the exception of milk. For example, high-fiber bread was more expensive than low-fiber bread, low-fat beef was more expensive than high-fat beef, and chicken breasts were more expensive than chicken drumsticks in convenience stores and supermarkets. The results of these more narrowly focused price studies demonstrate that substantial differences in the prices of healthier foods can occur in specific geographic areas, although studies using larger secondary data sources show a broader pattern of mixed results depending on the level of aggregation of the data by food type and by geographic region.

Variation in Food Prices Over Time Due to Inflationary Factors

Food prices vary over time because of changes in the availability of supplies of raw commodities, changes in farm-level production costs, and changes in food processing costs (e.g., due to changes in land, capital, energy, and labor costs). In addition, some food prices, particularly for fresh fruits and vegetables, vary seasonally, being lower during the products' harvest seasons.

Rising food prices may reduce the purchasing power of benefits received through federal nutrition assistance programs, depending on how and whether the benefits are adjusted for inflation over time (Hanson and Andrews, 2008). As discussed in Chapter 2, there is a lag of up to 16 months between calculation of the TFP cost and adjustments to the maximum SNAP benefit to account for inflation. Food prices are particularly affected by changes in world supply and demand and may increase more or less than the overall price level. As shown in Figure 4-2, the percentage changes in the CPI for food generally track the changes in the CPI

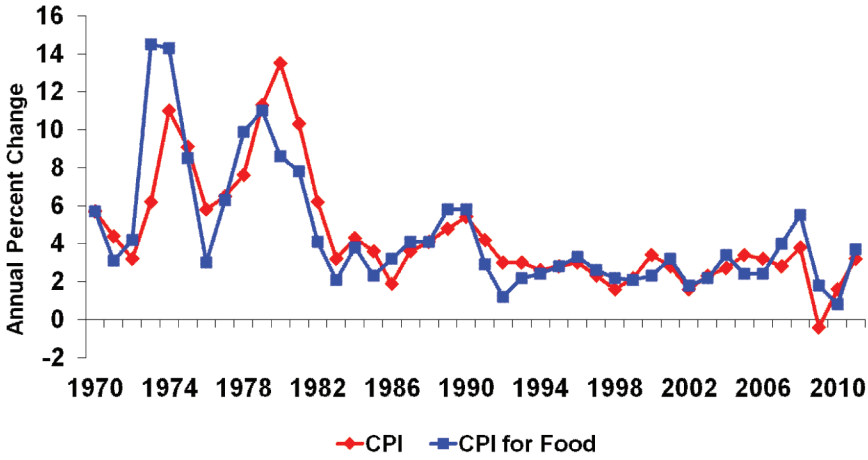

FIGURE 4-2 Overall Consumer Price Index (CPI) and CPI for food, 1970-2011, based on Bureau of Labor Statistics data.
SOURCE: Leibtag, 2012.

for all products, but the timing and magnitude of the changes are not always aligned. After a relatively stable period during the 1990s and early 2000s, increases in the CPI for food exceeded the overall CPI over many of the past few years. However, Hausman and Leibtag (2007) show that the methodology used by BLS to calculate the CPI may overstate the price of food because it does not fully capture lower prices in supercenters and other nontraditional retail outlets that sell food.

In addition to differences between changes in overall food price levels and changes in the price levels for all products, overall food price levels have been shown to differ from the price levels for the TFP (Hanson and Andrews, 2008). Figure 4-3 shows that the TFP price index, which is calculated using CNPP's monthly updates of the costs of the TFP, is rising more rapidly than the CPI for food consumed at home. The differences are likely due to larger shares of fresh fruits and vegetables and eggs, which have the most volatile prices, in the TFP price index than in the CPI for food consumed at home (Hanson and Andrews, 2008). Because SNAP benefits are adjusted annually in October using the prior year TFP price index, the food purchasing power of the benefits may decline to the extent that the adjustments do not fully account for the potential monthly rise in the cost of the TFP. However, because the TFP is a theoretical construct, actual food purchase patterns likely differ from the foods represented in the TFP. Thus, the extent to which the difference between the TFP price index and the CPI represents true higher costs to SNAP recipients is uncertain. The 16-month lag in adjusting the

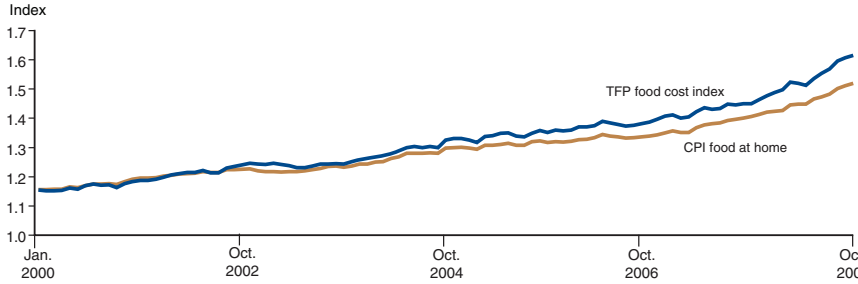

FIGURE 4-3 Thrifty Food Plan (TFP) food cost index compared with the Consumer Price Index (CPI) for food consumed at home.
NOTES: Monthly data. The TFP is for the reference family of four with children aged 6-8 and 9-10.
SOURCE: Hanson and Andrews, 2008. Data from USDA, ERS.

maximum benefit according to the CPI is a more certain contributor to a larger discrepancy between SNAP benefits and the actual cost of the TFP. The temporary increase in SNAP benefits under the American Recovery and Reinvestment Act of 2009[5] likely reduced this discrepancy, but the extent of reduction is currently unknown.

Access to Food Outlets

As described above, choosing foods that make up a diet consistent with the recommendations of the 2010 DGA, such as increased consumption of fruits and vegetables and whole-grain-rich foods and decreased consumption of solid fats and added sugars (USDA and HHS, 2010), can be challenging for populations with limited resources as a result of factors affecting food prices both regionally and locally. In light of this evidence, the committee examined additional evidence for an impact of the ability of low-income populations to access affordable healthy foods on the purchasing power of SNAP allotments under the assumptions of the TFP.

Access to Food Outlets and Purchasing Behavior

The committee identified a number of observational studies showing correlations between various means of access to food outlets and purchasing behavior. Personal transportation was previously discussed as an indi-

[5]American Recovery and Reinvestment Act of 2009, Public Law 111-5, 111th Congress (February 17, 2009).

vidual factor. The following discussion focuses on other barriers to access to healthy foods.

Urban or rural locale In a survey of the availability of fruits and vegetables in urban and rural areas of upstate New York, Hosler and colleagues (2008) identified one urban minority neighborhood among those surveyed that, in this respect, was the most disadvantaged site within an urban locale, as measured by the population density of stores selling these products. This community was found to be lacking not in the number of food stores but in an accessible high-impact super produce store. By contrast, such stores were available in a higher-income urban mixed neighborhood in the same locale, illustrating that disparity in access to fresh produce was associated with a single disadvantaged area within a larger locale.

A recent example of associations between access to healthy food and consumption is a cross-sectional community survey, conducted in 2002-2003, which was used as a data source for analyzing associations between neighborhood availability and consumption of dark green and orange vegetables in an ethnically diverse low- to moderate-income population in Detroit (Izumi et al., 2011). Data derived from the survey included the frequency of consumption of these vegetables and their availability in all food stores in the communities studied. The mean intake of dark green and orange vegetables among all participants was found to be 0.61 servings per day. The lowest intake was among participants living in neighborhoods where no store carried five or more varieties of such vegetables; residents in those neighborhoods consumed 0.17 fewer servings per day than those in neighborhoods where at least two stores provided more variety. The results of this study suggest a direct relationship between the availability of vegetables and consumption patterns within a locale.

Fisher and Strogatz (1999) conducted a telephone survey to (1) determine whether there is an association between the availability and consumption of low-fat milk, and (2) assess whether the availability of low-fat milk is associated with household income and racial composition. The study was carried out in three different geographic settings in New York: large metropolitan, midsize urban, and rural. Household interviews were conducted in each setting to determine the type of milk consumed. In each store surveyed within a corresponding zip code, containers of whole, 2 percent, 1 percent, and skim milk were counted for each container size (quart, half gallon, and gallon). The percentage of low-fat milk in the store and the average percentage across all stores in a zip code were then determined. A direct correlation was found among the percentage of low-fat milk in stores, consumption of low-fat milk in the household, and income level by zip code. In particular, low-fat milk tended to be less common in the stores located in rural or low-income areas and areas in which the major-

ity of the population was nonwhite. The authors note, however, that only 51 percent of survey respondents reported usually purchasing milk within their residential zip code.

Cheadle and colleagues (1991) conducted a similar study using a survey of healthful food choices in different grocery store environments to assess the relationship between individual dietary choices and the grocery store environment. They carried out a telephone survey in 12 different communities, including the corresponding larger zip code area, to obtain self-reported dietary intake data on low-fat and high-fiber foods, as well as the availability of health information in the community stores. They found a significant correlation between the availability of healthful foods in the community and zip code area stores and the self-reported healthfulness of participants' diets. In a review of cross-sectional studies on associations between food environment and consumption, Rose and colleagues (2010) identified a number of studies that combined in-store measures with mapping of store location and found significant direct associations between neighborhood food environment and measures of consumption.

These studies are important because they suggest a link between purchasing power and access to food. A general conclusion that can be drawn from this work is that although associated with income, access to food outlets and healthy foods needs to be considered in the context of how certain factors within the food environment affect the cost of healthier food options. Overall, the evidence suggests that limited access to healthy food may influence food shopping and spending behavior by reducing choices.

Farm-to-consumer venues Farm-to-consumer venues show promise in improving dietary intake among all people in the United States, including low-income groups (Blanck et al., 2011). However there are few such venues, especially in low-income communities (FNS, 2011). In addition, many farmers' markets do not accept SNAP. Although USDA figures indicate that the number of farmers' markets accepting SNAP has increased by 16 percent since 2010, more needs to be done to increase the number of these venues authorized as retailers by the program (FNS, 2011). The lack of awareness of farm-to-consumer venues, the lack of farmers' markets and farm stands close to home, the lack of transportation to these venues, inconvenient hours, and affordability concerns are additional barriers to use of farm-to-consumer venues among those receiving federal food assistance (Briggs et al., 2010).

Disparities in Access and Geographic Proximity to Food Outlets

According to a 2009 USDA report, 23.5 million people lack access to a supermarket within a mile of their home (Ver Ploeg et al., 2009). Limited

access to food stores is not unique to urban areas; about 20 percent of rural counties across the United States (418 counties) also have been identified as areas where half the population lives more than 10 miles from a large food store (Morton and Blanchard, 2007). The disparate distribution of grocery stores and supermarkets in low-income neighborhoods or geographic areas is especially notable in light of the distribution of racial/ethnic groups within these tracts. For example, Mantovani and Welsh (1996) found that "a large majority of low-income households are in close proximity to a full-line grocery store or supermarket" (p. iv), but minority households in rural areas live farther from these types of food stores than nonminority households.

Disparities in Access by Type of Food Outlet

Apart from the question of distance from a food store is that of where SNAP participants are more likely to shop. Ohls (1999) analyzed data from the National Food Stamp Program Survey, conducted between June 1996 and January 1997. The analysis examined the food shopping opportunities of low-income households, including SNAP participants and eligible nonparticipants. The study found that most low-income households shopped at supermarkets but tended to supplement their purchases by shopping at neighborhood grocery stores, convenience stores, bakeries, and produce markets. They also engaged in "careful" shopping practices, including making bargain purchases, taking advantage of special offers, and using shopping lists to extend their food dollars. Olander and colleagues (2006) and Castner and Henke (2011) also found that most SNAP participants redeemed their benefits at supermarkets, and their purchase patterns were similar to those identified by Cole (1997).

As noted by Mantovani and Welsh (1996), minority low-income groups may experience disparities in access that are not seen across the low-income population as a whole. In a study examining associations between local food environments and neighborhood racial/ethnic and socioeconomic composition, Moore and Diez Roux (2006) analyzed census tract demographics as well as food store characteristics in selected study areas in Maryland, New York, and North Carolina. Their comparison across study areas and across racial/ethnic composition revealed that the predominantly minority and racially mixed areas had at least twice as many grocery stores but fewer than half the number of supermarkets compared with predominantly white areas. The low-income and nonwhite areas also had fewer fruit and vegetable markets, bakeries, specialty stores, and natural food stores.

A cross-sectional survey in Michigan (Zenk et al., 2005) assessed the availability, quality, and price of fresh produce in various types of stores—large and small grocery stores, "mom and pop" stores, and convenience

and specialty stores—in three Detroit communities and an adjacent suburb. The communities surveyed varied in racial/ethnic composition and socioeconomic characteristics and exhibited different health profiles for diet and obesity-related diseases. Among the findings was that produce quality was lower in low-income African American communities than in more affluent or racially mixed neighborhoods. Moreover, the low-income African American communities had more than four times more liquor stores and fewer grocery stores per 100,000 residents compared with the racially mixed communities.

Overall, this body of evidence suggests that supermarket access is poorer among low-income and minority populations, and that individuals without ready access to supermarkets have more difficulty finding fruits and vegetables in their neighborhood. In addition, individuals with supermarkets in their neighborhood are more likely than those lacking nearby supermarkets to eat more fruits and vegetables.

Disparities in the Quality of Food Available for Purchase

In a cross-sectional study of 25 stores in South San Diego County, California, Emond and colleagues (2012) examined associations between the availability, quality, and cost of healthy and unhealthy food items and store location—specifically, non-ethnically based supermarkets and Latino grocery stores (tiendas) in low-income areas. They found no difference in the availability of fresh produce by store type and quality differences for only one fruit item. Further, the price per pound for fresh produce was lower in the tiendas than in the supermarkets. However, the cost of skim milk was significantly higher in the tiendas and lean ground beef was significantly less available than in the supermarkets surveyed. Similarly, Andreyeva and colleagues (2008), conducted two studies examining changes in price differences between large grocery stores and small neighborhood markets over the past 35 years (study 1), and price and nutritional quality as a function of income and neighborhood (study 2) in New Haven, Connecticut. In assessing the results of both studies, they concluded that the availability of many healthful food items was lower and produce quality was worse in lower-income than in higher-income areas even though average prices were not significantly different between the two types of neighborhoods. In Baltimore, Maryland, Franco and colleagues (2007) conducted a small observational study to determine the availability and price of food in 240 stores in area neighborhoods. In the neighborhoods surveyed, 94.4 percent of residents were African American; 64.4 percent of family households were female headed; the unemployment rate of residents was 23.5 percent, with a median household income of $15,493; and only 53.6 percent of adults had completed high school. Of the 187 food stores located within the city,

17 were classified as supermarkets, 136 as grocery stores, and 34 as convenience stores. No fresh fruits or vegetables, whole-wheat bread, or skim milk was found in the city's grocery stores; other food items, such as whole milk, soda, chips, and canned foods, were typically available. Further, the price of whole milk, cereal, and white bread at a representative store was 20 percent higher than in the closest supermarket, 0.9 miles away. Overall, food outlets in lower-income and minority neighborhoods tend to stock lower-quality items than food outlets in predominantly higher-income, white neighborhoods.

Disparities in Access to and Availability of Public Transportation

Residents in many urban areas have few transportation options to reach supermarkets. To examine whether access to transportation plays a role in risk factors for food insecurity and access to food outlets, Bjorn and colleagues (2008) developed and mapped a number of food insecurity index values, including income, ethnicity, employment, and education. Analysis of the indices identified a number of high-risk areas lacking food access in Seattle, King County, Washington. Many of the high-risk lower-income neighborhoods assessed were racially and ethnically diverse. For some of these areas, transportation access was a major barrier to food security. Households in the areas at risk of food insecurity were more vulnerable to economic and social as well as geographic barriers that may have made them dependent on local convenience stores and/or required long trips to distant grocery stores.

Inadequate transportation can also be a major challenge for rural residents, given the long distances to stores. Sharkey and colleagues (2009) examined associations between neighborhood needs, as measured by socioeconomic deprivation and vehicle availability, and two criteria for food environment access: distance to the nearest food store and fast-food restaurant, and number of food stores and fast-food restaurants within a specified network distance of neighborhood areas. The authors analyzed data from the 2006-2007 Colonias Food Environment Project and the decennial 2000 U.S. Census Summary File 3. They found that the rural neighborhoods studied had better access to convenience stores and fast-food restaurants in terms of both distance and shopping opportunity compared with access to supermarkets. Supermarkets provided greater proximity and coverage than traditional grocery stores, but when neighborhood deprivation was taken into account, the neighborhoods with higher deprivation had the least access to supermarkets and grocery stores but the greatest access to convenience stores. When transportation access was considered, limited availability of a vehicle was correlated with greater proximity to a supermarket as well as other store types, but higher deprivation was associated with greater

distance to supermarkets as well as other store types. Collectively, these results indicate an association between high-deprivation neighborhoods and both low access and limited transportation to supermarkets in a rural area.

In response to a request from Congress, USDA conducted a comprehensive 1-year study to assess the impact of limited access to food on local populations and outline recommendations for addressing the problem (Ver Ploeg et al., 2009). The study included two conferences on food deserts and a set of commissioned studies carried out in cooperation with the National Poverty Center at the University of Michigan, as well as reviews of the existing literature, a national-level assessment of access to supermarkets and large grocery stores, analysis of the economic and public health effects of limited access, and a discussion of existing policy interventions. Table 4-5 shows the study findings on access to supermarkets according to individual factors of low-income and underserved population groups in the United States. Data in the table indicate that the median distance to a supermarket for low-income, minority, and elderly populations is comparable to that for higher-income populations. However, as data in Table 4-6 indicate, the percentage of households without a vehicle is higher in low-income areas. For example, 2.5 to 3.3 percent of urban and 7.4 percent of rural low-income households live more than a mile from a supermarket and lack access to a vehicle. Research has shown that inadequate transportation is a significant barrier to access to supermarkets for residents of economically disadvantaged African American neighborhoods (Zenk et al., 2005).

Impact of Disparities in Access on Health Outcomes

The committee identified a number of studies examining associations between disparities in access to healthy foods and food insecurity, obesity, and obesity-related chronic disease. On the whole, the evidence supports a positive relationship between food insecurity and risk for obesity that is strongest among women (Dinour et al., 2007; Frongillo et al., 1997; Jilcott et al., 2011; Jones and Frongillo, 2006; Larson and Story, 2011; Velasquez-Melendez et al., 2011) and stronger among African American and Hispanic groups than whites (Fitzgerald et al., 2011; Sharkey and Schoenberg, 2005). The evidence reviewed was inconsistent as to significant associations between food insecurity and obesity in children (IOM, 2011).

A review of 54 studies examining associations between neighborhood differences in access to healthy food and risk for obesity identified an association between better access to convenience stores and higher risk for obesity (Larson et al., 2009). An observational study that analyzed data collected from a telephone survey found increased odds of obesity associated with distance to a supermarket in metropolitan but not in nonmetropolitan areas (Michimi and Wimberly, 2010). In contrast, another analysis of data

TABLE 4-5 Supermarket Access by Household Income, Race/Ethnicity, Age, and Vehicle Access

			Distance to Nearest Supermarket (miles)		
			High Access (≤0.5 mi)	Medium Access (0.5-1.0 mi)	Low Access (>1.0 mi)
	Number (millions)	Median[a] (miles)	Number in millions (percent)		
Income[b]					
Low-income	79.3 (28.8)	0.76	22.6 (28.5)	26.4 (33.3)	30.2 (38.1)
Higher-income	196.1 (71.2)	0.87	43.8 (22.3)	66.3 (33.8)	86.1 (43.9)
All income levels	275.5 (100)	0.84	66.5 (24.1)	92.7 (33.7)	116.3 (42.2)
Race/Ethnicity					
Nonwhite	85.7 (30.7)	0.63	31.4 (36.6)	31.5 (36.8)	22.8 (26.6)
White	193.9 (69.3)	0.96	39.1 (20.2)	61.3 (31.6)	93.4 (48.2)
All races/ethnicities	279.6 (100)	0.86	70.5 (25.2)	92.8 (33.2)	116.3 (41.6)
Age					
≥65 years	34.8 (12.4)	0.81	8.9 (25.7)	11.8 (33.9)	14.4 (40.4)
<65 years	244.8 (87.6)	0.82	61.6 (25.2)	81.0 (33.1)	102.2 (41.8)
All ages	279.6 (100)	0.82	70.6 (25.2)	92.7 (33.2)	116.3 (41.6)
Vehicle access					
Households without a vehicle	10.8 (10.3)	0.55	5.0 (46.2)	3.4 (31.7)	2.4 (22.1)
Households with a vehicle	94.1 (89.7)	0.84	22.2 (23.6)	31.7 (33.7)	40.2 (42.7)
All households	104.9 (100)	0.81	25.9 (25.9)	35.1 (33.5)	42.5 (40.6)

[a]Medians are weighted by population of each square kilometer grid area.

[b]Low-income households are those with income less than or equal to 200 percent of the federal poverty level for family size.

SOURCE: Ver Ploeg et al., 2009. Economic Research Service (ERS) analysis based on data from Census of Population, 2000, and the ERS-compiled supermarket directory for the contiguous United States in 2006.

TABLE 4-6 Household Vehicle Access and Supermarket Access

		Household Without Access to a Vehicle			
		0.5-1 Mile from a Supermarket		>1 Mile from a Supermarket	
	Total Households* (millions)	Number (millions)	Percent	Number (millions)	Percent
Total U.S.	104.9	3.4	3.2	2.4	2.3
Low-income areas	25.1	1.6	6.4	0.9	3.8
Urban areas	69.9	2.9	4.1	1.1	1.5
Low-income areas	15.6	1.3	8.3	0.4	2.5
Urban clusters	9.7	0.4	4.1	0.2	2.5
Low-income areas	3.6	0.2	5.6	0.1	3.3
Rural areas	25.3	0.2	0.8	1.1	4.4
Low-income areas	5.9	0.1	1.7	0.4	7.4

*This column shows the total number of households regardless of vehicle access.
SOURCE: Ver Ploeg et al., 2009. ERS analysis based on data from Census of Population, 2000, and the ERS-compiled supermarket directory for the contiguous United States in 2006.

collected on more than 21,000 Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) participants in Kansas failed to find an association between the availability of grocery stores and supermarkets within a census tract and body mass index (BMI) (Ford and Dzewaltowski, 2011). A recent ERS report (Ver Ploeg et al., 2009) suggests that access to a supermarket or large grocery store is a problem for a small percentage of households.

Other observational evidence supports a reduced risk for obesity and related conditions associated with better access to healthy foods. Morland and colleagues (2006) analyzed cross-sectional data collected from men and women participating in the third visit (1993-1995) of the Atherosclerosis Risk in Communities Study to determine whether characteristics of the local food environment were associated with the prevalence of cardiovascular disease risk factors. They found that people with access only to supermarkets or to supermarkets and grocery stores had the lowest rates of obesity and overweight, while those with access only to convenience stores had the highest rates. However, associations for diabetes, high serum cholesterol, and hypertension were not consistently observed.

To examine the association of retail food environments with obesity and diabetes, the California Center for Public Health Advocacy, PolicyLink, and the University of California, Los Angeles, Center for Health Policy Research combined individual-level demographic and health outcome data

from the 2005 California Health Interview Survey (CHIS, 2007) with the locations of retail food outlets. Geographic information system software was used to calculate a Retail Food Environment Index for each adult CHIS respondent within a given radius around his/her home address. It was found that in California, rates of obesity and diabetes were 20 percent higher for those living in the least healthy food environments after controlling for household income, race/ethnicity, age, gender, and physical activity levels (Babey et al., 2008).

Evidence that access to food has a direct impact on pregnancy outcomes is limited. In a study examining associations between diet quality, measured by a Diet Quality Index, among pregnant women and distance from a supermarket, Laraia and colleagues (2004) found that women living more than 4 miles from a supermarket had a twofold increased risk for being in the lowest quartile of the DQI. In another study on access to food and birth outcomes, Lane and colleagues (2008) found that women living in food deserts without access to healthy foods had significantly more low-birth-weight infants than women who had access to supermarkets and a variety of foods.

Although diet is integral to the treatment of diabetes and maintenance of glycemic control, evidence now exists that foods recommended as part of a healthy diabetic diet are in short supply in low-income, nonwhite neighborhoods. To illustrate, Horowitz and colleagues (2004) documented and compared the availability and cost of foods recommended for people with diabetes in East Harlem and the adjacent more affluent and predominantly white Upper East Side neighborhood. They found that the East Harlem neighborhood had a shortage of food markets, and some stores did not carry foods needed for a healthy diabetic diet. Additionally, the neighborhood had few large stores with a variety of foods and fewer stores that carried recommended food items. Further, East Harlem had many more undesirable stores than the more affluent Upper East Side neighborhood. These disparities in availability of healthy foods many be a barrier to diabetes self-management for East Harlem residents.

As described above, limited access to healthy food can influence purchasing behavior. Therefore, it is possible that the availability of food outlets and costs of food items may impact the purchasing power of SNAP allotments for healthy foods under the assumptions of the TFP, which in turn may affect diet-related health outcomes for SNAP participants.

Effectiveness of Addressing Environmental Challenges to Food Access

Environmental interventions to address challenges to food access show some promise. A recent study evaluating the impact of the first full-service supermarket to locate in Harlem in New York City found that the store allocated the same amount of space to fresh fruits, vegetables, fish, and

meat as a typical suburban market, at similar prices (Lavin, 2005). The Pennsylvania Fresh Food Financing Initiative—a statewide financing program designed to increase supermarket development in underserved areas—has funded 78 fresh-food outlets in Pennsylvania, which have increased food access for 500,000 children and adults (Karpyn et al., 2010). More research is need to understand what changes might improve access to food outlets. Approaches at the environmental level might include transportation policies that address both affordability and routes, and incentive/financing programs to increase the number of and quality of supermarkets in low-income, minority communities.

DATA AND ANALYTICAL CHALLENGES

While the evidence is clear that a number of factors create barriers to purchasing healthy foods under the assumptions of the TFP, the relative importance of these factors to determining the feasibility of defining the adequacy of SNAP allotments is uncertain. For example, is geographic proximity to food outlets more or less important than the the quality of food available for purchase? Is the type of food outlet available more or less important than access to public transportation? Understanding these issues is complicated by the following measurement challenges:

- Evidence on time requirements for SNAP participants to prepare healthy meals consistent with the assumptions of the TFP is lacking. Additional research is needed to evaluate the time used to prepare a healthy meal compared with that used for preprepared processed foods.
- Multiple dimensions have an impact on prices paid for food consumed at home by SNAP households. Additional evidence is needed to examine regional differences in the cost of foods purchased by SNAP participants.
- Existing studies consider access to stores almost exclusively from a consumer's home, not from work, church, or other activities, and therefore may not fully account for the range of access constraints experienced by SNAP participants. Thus further research is needed on the possible impact of limited access to certain food outlets (e.g., supermarkets) on the ability of some SNAP participants to purchase a variety of healthy foods at reasonable cost. Evaluation and assessment of barriers to access should include the degree to which, and for whom, limitations in access to food outlets constrain the SNAP allotment.
- The availability of food stores within a given locale is the most frequently used measure of the food environment. However, iden-

tifying stores can be difficult as information from some sources (e.g., proprietary databases of stores by category, size, and other attributes) may not always be up-to-date and thus may be inconsistent with information from federal sources such as USDA-FNS. Moreover, efforts to improve food access often are designed to solve local problems, which may vary considerably, leading to issues of generalizability.

- For purposes of assessing the adequacy of SNAP allotments, it is necessary to understand
  - —how prices paid by SNAP recipients vary relative to those paid by other populations;
  - —what types of foods are purchased by SNAP recipients using their benefits; and
  - —how benefits received from other federal nutrition assistance programs are used by individual SNAP participants.

Data gaps exist for prices, quantities, and types of foods purchased by SNAP participants using SNAP benefits or other resources by type of food outlet. If these data could be linked to information on basic household factors such as ages of SNAP recipients, numbers of children, region of the country, and rural or urban setting, analyses could be carried out to assess which individual, household, and environmental factors are most important in defining the adequacy of SNAP allotments.

SUMMARY OF FINDINGS AND CONCLUSIONS

The evidence reviewed in this chapter reveals a number of individual, household, and environmental factors that can influence the adequacy of SNAP allotments. The committee's findings based on this evidence take into account the robustness of the evidence and the likely impact of a given factor on the feasibility of an evidence-based definition of allotment adequacy. Although the committee acknowledges that most of the observational studies evaluated are cross-sectional, the findings considered collectively and in the context of the totality of the available evidence suggest that the factors with the greatest influence on the adequacy of SNAP allotments are availability of time to purchase and prepare meals, geographic variation in prices, and access to food outlets (at the environmental level). Consideration of these factors can inform the development of a definition of the adequacy of SNAP allotments and transform implicit assumptions underlying the determination of SNAP benefits into explicit statements that can be evaluated for SNAP participants. Factors for which the evidence is not strong enough to warrant their consideration in analyses to support an evidence-based assessment of the adequacy of SNAP allotments include nu-

trition knowledge, skills, and abilities, and transportation (at the individual/household level). The committee notes, however, that some factors, such as access to personal transportation, may be beyond the scope of USDA-FNS to use in an assessment of allotment adequacy.

Availability of Time to Purchase and Prepare Meals

The committee's review of evidence on the amount of time needed by most households, in particular those with a working head of household, to purchase and prepare food for healthy meals is inconsistent with the assumptions of the TFP. In addition, the resource constraints experienced by many low-income households, such as reduced transportation access to food outlets, widen the disconnect between the time needed to prepare meals consistent with the TFP and the reality of the amount of time available to these households. Further, evidence from analyses of household food expenditures suggests that the result of failing to account for labor costs is severe underestimation of the real cost of food for low-income households.

Geographic Variation in Prices

The evidence reviewed by the committee shows that food prices vary substantially across geographic regions of the country and between rural and urban areas. Yet the cost of the TFP, which serves as the basis for determining the maximum SNAP benefit, is not adjusted by geographic region, with the exception of Alaska and Hawaii. SNAP participants in locales with higher food prices would likely have greater difficulty than those in areas with lower food prices in purchasing the types and amounts of foods determined in the TFP as adequate to meet their needs for a healthy diet. The evidence points further to a lack of data on the magnitude of the impact of differences in food prices across locales on the ability of SNAP participants to purchase sufficient quantities of healthy foods based on household composition assumptions (Gundersen et al., 2011).

Access to Food Outlets

Overall, the evidence reviewed by the committee suggests that access to supermarkets is lower among low-income and minority populations than other population groups and that individuals without access to supermarkets experience greater disparity in availability of healthier foods, such as fresh fruits and vegetables, in their neighborhood food outlets. In addition, a lack of transportation infrastructure was found to be the most defining characteristic of limited food access for small-town and rural areas.

Nutrition Knowledge, Skills, and Abilities

The evidence reviewed by the committee suggests that evaluations of nutrition education programs for low-income participants that include skill-based education show change in behavioral outcomes. This finding lends credence to the theory that nutrition knowledge and skills are limited and that education is necessary to assist households in maximizing the purchasing power of their SNAP benefits. However, evidence on the influence of nutrition knowledge and skills on the ability of SNAP participants to purchase and prepare healthy foods consistent with the assumptions of the TFP is insufficient to support a conclusion about the relevance of these factors to an evidence-based definition of the adequacy of SNAP allotments. Assessing the nutrition skills of the SNAP population directly (i.e., through direct observation) would be difficult at the population level. However, several variables likely to be associated with skill level could be assessed—for example, skills normally used (e.g., using grocery store lists, planning meals, using recipes with raw ingredients), perceived level of these skills, and self-efficacy to perform the skills.

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5

Impact of Program Design on Allotment Adequacy

This chapter presents evidence on the detailed components of the benefit formula for the Supplemental Nutrition Assistance Program (SNAP) and examines their impact on the purchasing power of SNAP allotments and the implications for the definition of the allotments' adequacy (see Box 2-2 in Chapter 2 for a detailed description of the calculation of SNAP allotments). Specific components of the benefit formula examined by the committee include the maximum benefit guarantee, the benefit reduction rate, and various deductions to net income. Additionally, the committee reviewed evidence on such factors as the geographic adjustment of benefits and the timing of benefit updating and receipt that can have either a direct or indirect impact on the benefit formula and thus on allotment adequacy, as well as factors that influence the types of foods purchased with SNAP benefits, including dietary knowledge, preferences, and cultural influences. Factors such as nutrition education and incentives and restrictions on benefit usage, as well as information on retail food outlets, also are considered because they provide a more complete picture of how SNAP benefits are used and the possible implications for the adequacy of SNAP allotments. The chapter ends with a summary of findings and conclusions.

EVIDENCE ON THE COMPONENTS OF THE SNAP BENEFIT FORMULA

Following certification for participation in SNAP, a monthly allotment is computed based on (1) the maximum SNAP benefit for the household size, (2) the benefit reduction rate, and (3) the household's or individual's

net income. The following discussion reviews evidence identified by the committee on components of the SNAP benefit formula and the factors that influence them, and assesses their relationship to the purchasing power of SNAP allotments.

Maximum Benefit Guarantee

Entitlement to SNAP benefits is derived from the cost of the Thrifty Food Plan (TFP) for a family of four. The TFP is based on the cost of purchasing foods consumed by individuals in four age-gender groups. The U.S. Department of Agriculture (USDA) developed four food plans (described in Chapter 2) based on market baskets of food that can provide a diet meeting dietary recommendations for individuals.[1] The foods in each market basket are based on current consumption patterns, dietary recommendations, and food composition data and prices. In determining SNAP benefits, the following age-gender groups are used: a male and a female aged 19-50, a child aged 6-8, and a child aged 9-11. In 2006, the market baskets were revised to reflect the Dietary Reference Intakes (IOM, 1997, 1998, 2000, 2001, 2005a,b), the 2005 *Dietary Guidelines for Americans* (DGA) (USDA and HHS, 2005), the 2005 MyPyramid Food Guidance System (USDA, 2005), and changes in food prices and consumption patterns.

Household Size and the Benefit Level

As noted in Chapter 2, the TFP is designed for a reference family of two adults and two children, and the cost is then adjusted for families of different sizes to reflect economies of scale in food purchases. As described in Box 5-1, relative to the per-person benefit for a family of four, the per-person benefit is increased by 5 percent for a family of three, by 10 percent for a family of two, and by 20 percent for a family of one. Per-person benefits are reduced by 5 percent for families with five or six members and by 10 percent for families with seven or more members. These adjustment factors do not appear to be in line with differential spending patterns for food across families of different sizes, however. According to calculations from the 2010 Consumer Expenditure Survey, per-person expenditures on food are 11 percent higher for families of three than for families of four; families of two and one spend 36 and 57 percent, respectively, more per person than families of four. When restricted to purchases of food consumed at home, the numbers are slightly different and suggest that a more realistic economies-of-scale multiplier would be 44 percent for a one-person family,

[1]Detailed information on the plans is available at www.Cnpp.usda.gov/Publications/FoodPlans/MiscPubs/TFP2006Report.pdf (accessed March 11, 2013).

BOX 5-1
Economies of Scale

Food costs for the Thrifty Food Plan are based on individuals in the context of a reference four-person family. For households that are larger or smaller than the reference, per-person food costs are adjusted for economies of scale using a suggested adjustment such as the following:

- One person—add 20 percent
- Two persons—add 10 percent
- Three persons—add 5 percent
- Five or six persons—subtract 5 percent
- Seven or more persons—subtract 10 percent

SOURCE: CNPP, 2011.

33 percent for a two-person family, and 13 percent for a three-person family. The published tables do not allow for separately calculating multipliers for households of five or larger. These calculations are based on averages for all consumer units and are not restricted to low-income households, whose purchasing patterns may differ from those of other households. In addition, they are based on actual consumption patterns and do not account for differences in nutritional intake or adequacy that may exist across different household sizes. Nonetheless, the evidence reviewed by the committee suggests that the current economies-of-scale multipliers may be substantially underestimated for small households.

Household Composition and the Benefit Level

Recommended nutrient intake varies by individual characteristics such as sex, age, and level of activity. Therefore, the cost of food under the TFP also varies by these characteristics, with lower levels for the elderly and young children. Instead of being adjusted to meet each household's individual characteristics, the SNAP benefit amount is set for a representative "reference family," allocating all households of a certain size the same benefit even if their individual characteristics (age, sex, activity level) vary. As discussed in Chapter 2, a 1975 U.S. Circuit Court decision took issue with this assumption and directed USDA to either individualize benefits or set them at a high enough level "so that virtually all recipients are swept

within it."[2] USDA opted for the latter approach, which it operationalized by rewriting the food plans to better account for nutritional guidance and to fit a four-person reference family that included two school-aged children and an adult male and female. The reference family benefit amount was adjusted for different family sizes using economies of scale (Box 5-1).

Based on 2010 household composition data, 30.7 percent of all SNAP participants were school-aged children, 15.9 percent were preschool children, 45.6 percent were nonelderly adults, and 7.9 percent were elderly adults. The SNAP reference family comprises a male and a female aged 19-50, one child aged 9-11, and one child aged 6-8. Using June 2011 data, females aged 19-50 require $156.70 per month in food expenditures, a female aged 12-13 requires $129.00, and a female aged 14-18 requires $157.20 (CNPP, 2011). In contrast, a male aged 19-50 requires $176.00 per month, a male aged 12-13 requires $158.60, and a male aged 14-18 requires $164.50. The current monthly individual food expenses for the reference family are shown in Table 5-1.

The reference family's food expenditures come to $612.00 per month, and this amount is used to set the maximum benefit, which is then adjusted by the economies-of-scale multipliers to account for different family sizes. "Unusual" household composition will obviously cause variation from this formula. For example, a household of four nonelderly adult males would fall short of meeting the reference family criteria for a maximum-benefit four-person household (by $92 a month), whereas a household with one adult, two preschool-aged children, and one school-aged child would be eligible for the maximum benefit for the household size even though the benefit would exceed the household's requirement by as much as $129.00 a month.

While it would be possible to issue benefits based on the age and sex of household members at a point in time, any change to the current law would require great care. Households likely to lose the most benefits would be those with a disproportionate number of small children and those with more elderly adults, because they require less food expenditure per month. Those most likely to benefit would be households with disproportionately more adolescents or nonelderly adults, particularly males. The committee was unable to estimate the cost fraction that would increase or decrease the allotment if the estimate were based on individual household composition rather than the reference family, because the data needed to do so were unavailable, and the time and resources required to produce such an estimate were beyond the scope of this study.

[2] *Rodway v. United States Department of Agriculture*, 514 F.2d 809, 168 (U.S. App. D.C. 387, 1975).

TABLE 5-1 June 2011 Monthly Food Expenses by Sex and Age Group

Sex/Age Group	Monthly Food Expenditure Under the TFP ($)
Male, aged 19-50	176.00
Female, aged 19-50	156.70
Child, aged 9-11	149.00
Child, aged 6-8	130.00

NOTES: TFP = Thrifty Food Plan.
SOURCE: CNPP, 2011.

Geographic Considerations

The maximum SNAP benefit varies only by family size in the contiguous United States, but is adjusted upward in both Alaska and Hawaii, presumably because of higher food costs. The presumption, then, is that the variation in prices from the average used in constructing the TFP in the lower 48 states and the District of Columbia is not sufficient to warrant the additional complication of program administration entailed in making similar adjustments. These complications include identifying the appropriate data source and then determining how to apply it meaningfully to households that live on the border of one or another geographic area. The maximum benefit is adjusted each October based on the Consumer Price Indexes (CPIs) for the 29 food categories in the TFP that have a corresponding CPI or set of CPIs for each age-sex group (Carlson et al., 2007). There has been a long-standing assumption that the variation in prices for these 29 categories is not significant across the contiguous states and the District of Columbia. The challenge in questioning this assumption is that the Bureau of Labor Statistics (BLS) does not produce an official CPI for different areas of the country, or one for the TFP. The CPI for All Urban Consumers (CPI-U) spans 87 percent of the population (BLS, 1998), and from this set BLS releases a monthly CPI for the 3 largest metro areas, a bimonthly index for 11 more metropolitan statistical areas (MSAs), and a semiannual index for 12 additional metro areas. However, these subnational price indices do not cover all MSAs or any nonmetro/rural areas. This historic lack of data on regional food prices led the National Academy of Sciences Panel on Poverty and Family Assistance to recommend that cost-of-living differences in the poverty threshold be adjusted only for differences in housing as captured by the U.S. Department of Housing and Urban Development's Fair Market Rents Index (NRC, 1995). Presently, the approach followed by the Census Bureau in its Supplemental Poverty Measure is to follow the recommendation of the Committee on Poverty Measurement of adjusting the poverty threshold only for differences in housing costs, but using differences

in rents for two-bedroom units as measured in the American Community Survey (Renwick, 2011; Short, 2011).

As described in Chapter 4, a series of recent papers from the Economic Research Service has documented substantive regional differences in food prices (Gregory and Coleman-Jensen, 2012; Leibtag, 2007; Todd et al., 2011). Leibtag (2007) shows that, based on Nielsen Homescan data, food prices in the West and Northeast are above average, while those in the South and Midwest are below average, meaning that the SNAP dollar can go further in the South and Midwest than in the West and Northeast. Although low-income consumers adopt coping mechanisms to stretch the SNAP dollar, Leibtag (2007) finds that differences in prices across regions exceed differences in prices paid across demographic (income) groups. Todd and colleagues (2011) provide corroborative evidence that geographic price variation in healthy compared with unhealthy foods may help explain geographic differences in health outcomes. Indeed, Gregory and Coleman-Jensen (2012), using local prices from the Quarterly at Home Food Survey merged with Current Population Survey (CPS) data on food insecurity, find that this regional price variation affects food insecurity—a one standard deviation increase in the cost of a TFP-type basket of goods results in an 8.4 percent increase in adult food insecurity and a 15.9 percent increase in child food insecurity (see Chapter 4).

The committee considered evidence from Children's HealthWatch because these studies assessed the influence of regional price variations on the purchasing power of SNAP benefits. These studies included a series conducted in Boston and Philadelphia in 2008 and 2011 that examined local costs of purchasing foods consistent with the assumptions of the TFP based on the maximum SNAP benefit (Breen et al., 2011; Thayer et al., 2008). For these studies, the authors assembled grocery lists comprising 107 items from the TFP to feed a two-adult, two-child family (the SNAP reference family). In the 2008 study, four neighborhoods in each city were selected, and within each neighborhood, four stores were selected (two small, one medium, one large). The authors found that families receiving the maximum SNAP benefit needed to spend an additional $2,520 in Boston and $3,165 in Philadelphia per year to purchase foods that meet the TFP guidelines, or roughly 40 to 50 percent more than the maximum annual benefit amount of $6,504 for a four-person family in fiscal year (FY) 2008. This deficit, while varying in magnitude, was present across all four store sizes. The authors also found that 16 and 38 percent of the 107 items were unavailable in the Boston and Philadelphia stores, respectively. In a 2011 follow-up study in Philadelphia, the deficit was lower, but a still substantial $2,352 per year. Although this evidence is limited, the committee did not find additional evidence to support a converse perspective.

Impact of the American Recovery and Reinvestment Act

In 2009, as part of the national stimulus package, SNAP benefits were increased by 13.6 percent, effective April 2009. Four-person families received a maximum benefit increase of $80 per month (presumably explaining in part the reduced TFP deficit found in 2011 in Philadelphia by Children's HealthWatch). For a household of three, the maximum benefit increased from $463 to $526 per month. Future increases would be based on 2009, and therefore their impact would be reduced each year once inflation was taken into account (CBO, 2012). The American Recovery and Reinvestment Act of 2009[3] (ARRA) also allowed states to suspend time limits for unemployed able-bodied adults through FY 2010, increased the minimum benefit from $14 to $16 per month, and increased administrative funding to states. Subsequent legislation set an expiration date of November 2013 for the 13.6 percent benefit adjustment.

USDA found that "the food security of low-income households (those with incomes in the eligible range for SNAP) improved from 2008 to 2009, and a substantial share of that improvement may be due to the increase in SNAP benefits implemented under ARRA" (Nord and Prell, 2011, p. iii). During that period, the SNAP benefit received by the typical low-income household increased by about 5.4 percent (Nord and Prell, 2011). Food security did not increase, however, for households only a little above the SNAP eligibility level. In 2012, the benefit level for a four-person household remains at $668 per month, while the TFP for this category is set at $611.70, resulting in a $56 difference per month.

Regional differences in food prices discussed above, coupled with a number of food access challenges and reduced food insecurity attributed to the ARRA expansion, have led some stakeholders to call for permanent increases in the TFP or for the maximum benefit to be linked to another USDA food plan, such as the Low-Cost Food Plan (Children's HealthWatch, 2012; FRAC, 2012). The counterargument for permanently adjusting the maximum benefit or linking it to the Low-Cost Food Plan is that to make such a revision cost-neutral, participation would have to be restricted and/or some other aspect of the net income formula (discussed below) would have to be altered to reduce the benefits of those not at the maximum so as to hold total spending in check. Cost neutrality, however, is a requirement linked to the TFP. Moving from the TFP to the Low-Cost Food Plan would necessitate a higher cost that is not supported by the current statute. In the absence of cost neutrality, neither restriction of participation nor reduction of benefits would be necessary, but given that the Low-Cost Food Plan is

[3]American Recovery and Reinvestment Act of 2009, Public Law 111-5, 111th Congress (February 17, 2009).

about one-quarter more expensive than the TFP, the cost considerations cannot be ignored. This evidence informed the view that determining the adequacy of the TFP as the benchmark for the maximum benefit appears more pressing today given that 40 percent of the SNAP caseload is receiving the maximum benefit (Eslami et al., 2011), suggesting that SNAP is the *primary* source of food support for a large fraction of the caseload.

Benefit Reduction Rate

As described in Chapter 2, SNAP benefits are calculated as the difference between the maximum benefit guarantee for a given unit size and 30 percent of the unit's net income (see Box 5-2). In other words, benefits are reduced by 30 cents for each additional dollar of a household's net income. This benefit reduction rate (BRR) has remained unchanged since the 1977 Food Stamp Act (see Box 5-2).[4] The rationale is that benefits are a supplement to households' food purchases and that participants with incomes should be able to contribute 30 percent of their own cash resources toward food purchases. The 30 percent figure was based in part on an analysis of 1955 USDA consumption data showing that the median family spent one-third of its income on food (Orshansky, 1957). Since not all of a household's income is counted to determine the SNAP allotment, in practice the formula assumes that recipients can spend 20-25 percent of their total monthly cash income on food (Committee on Ways and Means, 2004; Ziliak, 2008).

Evidence reviewed by the committee suggests that the BRR of 30 percent does not reflect current spending patterns for most U.S. households. In contrast to the findings of Orshansky (1957), the median family in the United States today typically spends a lower share of its income on food than the BRR assumes. According to the Consumer Expenditure Survey (CES), in 2010 the average "consumer unit"[5] spent just under 13 percent of its pretax income on food consumed both at home and away (BLS, 2011a). Lower-income consumers typically spend a higher share of their income on food, but even among low-income families, the fraction spent on food is substantially lower today than in 1955. For example, data from the 2010 CES show that consumers with pretax incomes of $5,000 to $9,999 spent 16.8 percent of their income on food, those earning $20,000 to $29,999 spent 13.7 percent, and those earning over $70,000 spent 11.7 percent (BLS, 2011a).

[4]Reimbursement of Census Enumerators for Telephone Tolls and Charges, Public Law 88-535 (August 31, 1964).

[5]"Consumer units include families, single persons living alone or sharing a household with others but who are financially independent, or two or more persons living together who share expenses" (BLS, 2011b).

BOX 5-2
SNAP Benefit Reduction Rate

The SNAP benefit reduction rate is the rate at which the maximum benefit is reduced per dollar of income. The current benefit reduction rate is 30 percent and is based on the assumption that an average household will spend 30 percent of its net income on food. Thus, for each additional dollar of net income, the maximum SNAP benefit is reduced by 30 cents. The minimum benefit after all income-related reductions for one- and two-person households in the contiguous United States in 2009 was $16 per month.

SOURCES: FNS, 2012e,f.

The committee identified important design trade-offs involved in setting the BRR that can influence the amount of the SNAP benefit a participant receives. A high BRR keeps program costs lower and directs more of the benefits toward recipients with the lowest incomes. Holding other factors constant, a high BRR keeps program costs lower because it reduces the benefit at a faster rate as labor and other taxable income increases. A higher BRR also keeps program costs lower because fewer people are eligible. That is, using the notation of Box 2-2 in Chapter 2, the "break-even" income level (Y(b)) for eligibility can be defined as Y(b) = G/BRR + D, where G is the maximum benefit, BRR is the benefit reduction rate, and D is deductions and exemptions used in constructing net income Y(n). Holding G and D fixed, a higher BRR results in a lower Y(b) and thus fewer people eligible.

On the other hand, a higher BRR also poses a disincentive for recipients to work because their benefits will be reduced at a relatively high rate for each additional dollar earned. Although evidence on the work disincentive effect of the BRR generally suggests the effect is small or modest (Fraker and Moffitt, 1988; Hagstrom, 1996; Hoynes and Schanzenbach, 2012), the BRRs accumulate across programs, leading to potentially large aggregate work disincentive effects when SNAP benefits are received in conjunction with other transfers, such as Temporary Assistance for Needy Families (TANF), housing, and the earned income tax credit (Keane and Moffitt, 1998). Of importance, a lower BRR preserves the incentive to work for participants who are not near the eligibility threshold, but for participants who are close to the eligibility threshold, earning more may make them ineligible for the program. In the extreme case in which a recipient is exactly on the margin of eligibility and receives the minimum SNAP benefit of $16 per month, earning $1 would have the net impact of losing $15. In some

cases, decreasing the BRR might make this notch at the eligibility threshold even larger, discouraging work among this group of recipients.

The effective tax rate on earnings is somewhat complicated because two of the deductions used to compute net income are themselves functions of income. The earned income deduction of 20 percent reduces the effective tax rate on benefits. The excess shelter cost deduction (see page 157) is calculated as the amount of shelter costs over 50 percent of net income after other deductions are taken, so an increase in income can reduce this deduction. As a result, an increase in income can result in a benefit reduction that is greater than the base (Ohls and Beebout, 1993).

Net Income Determination

Earned Income Deduction

An important change within the SNAP population is that an increasing proportion of the SNAP caseload is employed (Eslami et al., 2011). This shift toward a greater number of employed participants can have an impact on the purchasing power of the SNAP allotment because of expenses related to employment, such as transportation to work and child care expenses, which reduce the disposable resources available to purchase food. To account for the cost of being employed, the SNAP formula allows certain deductions in the calculation of a household's net income on which the benefit level is based. Twenty percent of earned income is deducted, and recipients can deduct their spending on dependent care (prior to 2008 the dependent care deduction was capped at $175 per month per dependent) (CBPP, 2010).

There has, however been less recognition that being employed reduces the time available to prepare meals (Davis and You, 2010; Rose, 2007). As discussed in previous chapters, the cost of the TFP does not take into account time costs for food procurement and meal preparation, and therefore does not explicitly account for the trade-off between the costs of more expensive, intermediate-prepared foods and the labor costs of preparation. For example, a household may prefer to purchase prepared foods (e.g., precut carrots or shredded lettuce) instead of spending the time to prepare meals from raw ingredients. Given this trade-off, the earned income deduction at its current level may reduce the overall purchasing power of the SNAP allotment, especially for those facing time constraints such as households headed by a working single mother. Employment among single mothers accelerated with the reforms of the 1990s toward a more work-based safety net, notably the expansions of the earned income tax credit that increased the reward for working and the 1996 Welfare Reform Act,[6]

[6]Personal Responsibility and Work Opportunity Reconciliation Act of 1996, Public Law 104-193 (August 22, 1996).

which introduced work requirements for and time limits on the receipt of cash welfare (Blank, 2002; Meyer and Rosenbaum, 2001).

Changes in participation rates for some subgroups in the SNAP population may be attributable to a combination of effects. For example, changes in the economy, in program rules, in the availability of other public assistance programs, and in the participation decisions of eligible individuals all contribute to fluctuations in SNAP participation. Participation by children, individuals in households with earnings, small households, nondisabled childless adults subject to work requirements, and noncitizens all increased in FY 2008 and 2009 (Leftin et al., 2011). At the same time, participation by the elderly and by individuals in households earning at about the poverty threshold remained relatively unchanged.

Shelter Deduction

Recent evidence shows that the shelter deduction, which consists of expenses such as rent, mortgage payments, and utilities,[7] is claimed by more than 70 percent of all households, and more than 28 percent of these households have housing expenses that exceed the SNAP shelter cap (Eslami et al., 2011). The actual amount deducted from income is that portion of a household's shelter costs that exceeds 50 percent of its income after all other deductions. However, the shelter deduction may not exceed $459 in 2012. As mentioned in Chapter 2, the shelter deduction cap is adjusted every fiscal year to reflect changes using the CPI-U for the previous 12 months ending November 30.[8] Households with elderly or disabled members are not subject to the cap.

In a study carried out in 2002, the Center on Budget and Policy Priorities found that in the Northeast, Midwest, South, and West, 57, 53, 47, and 57 percent, respectively, of households had shelter costs exceeding 50 percent of their income (Rosenbaum et al., 2002). However, the study also found that the substantial differences in the amount households pay for their housing "is not a geographical phenomenon" and that variation in housing costs paid by SNAP-eligible households exists within all regions of the country. This finding was based on quality control data from USDA's Food and Nutrition Service (FNS) as well as from the 1999 American Housing Survey. The American Housing Survey was updated in 2007; however, the committee is not aware of updates to this study. Because geographic variation is so great within rather than among regions and states, the shelter deduction and the other individualized deductions are one way to account in part for geographic price differences. Thus, the question arises

[7]Households can claim actual utility costs or use a standard allowance, which varies by state.

[8]Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriation Act of 2001, Public Law 106-387, Sec. 846 (October 28, 2000).

of whether the 50 percent threshold and the shelter deduction cap are adequate for determining a realistic net income for SNAP participation.

Standard Deduction

All households receive a standard deduction from gross income that is intended to account for unusual or unexpected household expenses that could limit food purchasing power. The deduction varies by household size and is adjusted annually. The deduction is set at 8.31 percent of the income eligibility standard, not to exceed 8.31 percent for a family of six. The 2012 standard deductions are $147 for households of one to three members, $155 for households of four, $181 for households of five, and $208 for households of six or more. Wilde (2002) estimated that a $1.00 increase in the standard deduction raises SNAP benefits by $0.30 to $0.45 for households with positive net cash income. This variation occurs because of an interaction between the standard deduction and the excess shelter deduction. That is, a $1.00 increase in the standard deduction raises benefits by $0.30 for those without an excess shelter deduction, but raises them by $0.45 for those who also have the shelter deduction but are below the shelter cap.

Geographic Adjustment of SNAP Benefits

In addition to the adjustment to the maximum benefit for residents of Alaska and Hawaii, several aspects of the current SNAP benefit formula directly or indirectly accommodate differences in cost of living across regions of the country. This has the effect of either lifting some to the maximum benefit (because the deductions lower net income to zero) or raising the monthly benefit payment. This geographic adjustment is accomplished directly by the excess shelter deduction, which, as described previously, permits the deduction of housing and housing-related costs above 50 percent of net income after other deductions. Because housing costs vary widely across the nation, this deduction accommodates to some extent the geographic variation in cost of living. In FY 2012, however, this deduction was capped at $459 per month, and nearly 30 percent of recipients have housing costs in excess of this cap, suggesting that the cap is a binding constraint for many SNAP households.

There are two major deductions available to working SNAP recipients that implicitly introduce geographic differences in SNAP benefits. The first is the 20 percent deduction of earnings from gross income. Wages vary greatly across the country because of differences in local labor markets (Moretti, 2011); moreover, wages for the same job in the same company but in different locations vary greatly both within and across countries (Ashenfelter, 2012). Thus two SNAP recipients working full-time as cashiers

at the same major fast-food chain—for example, one in New York City and the other in Kansas City—would have different levels of deductions for the purpose of net income: net income would be lower and the SNAP benefit higher for the recipient in New York City than for the one in Kansas City. The second deduction for working SNAP recipients (and for those seeking work or students/trainees) is the dependent care deduction. Prior to the Farm Bill of 2008,[9] the dependent care deduction was capped at $175 per month, but since 2008 it has not been capped. This means that actual costs of dependent care, such as the direct cost of care, transportation to and from care, copayments for subsidized care, unreimbursed payments for care, and fees for unused care, may be deducted in the net income calculation (CBPP, 2010). Because the cost of child care varies across states (NACCRRA, 2011), the amount of the dependent care deduction will vary accordingly.

The committee identified three additional implicit geographic cost-of-living adjustments in the benefit formula that can have an effect on the SNAP allotment. First, the elderly and disabled can deduct their monthly out-of-pocket medical expenses in excess of $35 from net income. Given that regional differences in medical spending are substantial (CBO, 2008; Fisher et al., 2009), this introduces geographic cost-of-living differences into the benefit formula. A second regionally focused deduction comes from the child support payment allowance. Pirog and colleagues (1998) document cross-state differences in child support awards, and this, too, may introduce geographic variation in SNAP benefits. The third adjustment works in the opposite direction from the others by reducing the size of the SNAP allotment. Income from other transfer programs, such as TANF, reduces the size of the SNAP benefit, and since the TANF benefit is set at the state level and tends to be higher in high-cost states, this has the effect of "taxing" the SNAP allotment in high-cost areas since it is set nationally at a fixed level for the lower 48 states.

Because most of the geographic differences in cost of living in the SNAP benefit formula are implicit rather than explicit, the question arises of whether making the adjustment more direct would facilitate definition of the benefit's adequacy. For example, the evidence of regional differences in prices across the lower 48 states (recall that Alaska and Hawaii already have upward adjustments to benefits) suggests that in lieu of moving from the TFP to the Low-Cost Food Plan as the baseline for the maximum benefit, one could instead index the benefit for differences in the cost of living. That is, the indexed benefit for location i in time period t (B_{it}) would be the product of the price index (P_{it}) and the federal maximum benefit guarantee (G), or $B_{it} = P_{it} \times G$. Normalizing the average price index to 1, P_{it} would be

[9]Food, Conservation, and Energy Act of 2008, Public Law 110-234 (May 22, 2008).

<1 for low-cost locations and >1 for high-cost locations. This implies that the maximum benefit could actually fall for many areas, which is not allowed under current law and arguably may not be efficient in terms of meeting the program goals of improving food security and access to a healthy diet, given the evidence that higher benefits improve these outcomes. This suggests an alternative of restricting P_{it} to ≥ 1, which means that for average or low-cost areas, benefits would be linked to the TFP as is current practice, but those living in high-cost areas would receive an upward adjustment. Presumably this approach would address some of the food benefit gap as identified by Children's HealthWatch in Boston and Philadelphia (Breen et al., 2011), and likewise in similar high-cost locations. Conversely, this asymmetric adjustment would lead to increased program costs.

The challenge of implementing geographic cost-of-living adjustments is that at present, BLS does not produce a regional price index. As stated by BLS, the CPI for the four major census regions (Northeast, South, Midwest, West), along with that for the 27 major MSAs, "measures how much prices have changed over a specific period in that particular area; it does not show whether prices or living costs are higher or lower in that area relative to another. In general, the composition of the market basket and the relative prices of goods and services in the market basket during the expenditure base period vary substantially across areas" (BLS, 2011c, FAQ 14). Researchers at the Bureau of Economic Analysis are conducting ongoing research into the production of a regional price index (Aten et al., 2012), while those at the Census Bureau involved in poverty measurement are adjusting poverty thresholds only for differences in spending on housing (Renwick, 2011; Short, 2012). In the short term, adjusting the maximum benefit geographically for differences in cost of living (or even food) is likely to be infeasible until further progress is made on regional price indices.

Timing of Benefits

SNAP benefits are deposited onto an Electronic Benefit Transfer (EBT) card near the beginning of each month. USDA research shows that about 80 percent of benefits typically are used up within the first 14 days, and by the 21st day of the month, more than 91 percent has been spent (FNS, 2012a). Because families that run out of benefits usually do so at the end of the month, it has been suggested that benefits be issued semimonthly to level out spending. Benefits were in fact issued semimonthly at one time, but that was when there was a purchase requirement (see Chapter 2). Those who use food pantries and other private food assistance to supplement their SNAP benefits might be expected to change the timing of their usage to reflect a semimonthly cycle. Whether this would be advantageous to food providers

is unclear, nor is it clear whether such an adjustment in benefit allocation would help households better manage their benefits and cash flow.

IMPACT OF RESTRICTIONS AND INCENTIVES ON THE PURCHASING POWER OF SNAP BENEFITS

The committee considered a number of factors not directly related to the SNAP allocation that influence the type of foods purchased with SNAP benefits. These factors—incentives and restrictions on benefit usage, eligibility rules for retail outlets, and nutrition education—are examined here only in the context of how they might influence the feasibility of defining the adequacy of SNAP allotments consistent with the goals of increasing food security and access to a healthy diet. However, the committee recognizes that these factors are not directly linked to defining the adequacy of SNAP allotments. Further, in carrying out its charge, the committee was asked *not* to consider revisions to the TFP. As a consequence, the committee derived no conclusions or recommendations from the following discussion that would directly alter the TFP.

Purchase Restrictions

SNAP places few limits on the use of benefits. As discussed in Chapter 2, eligible foods include any food or food product for home consumption, as well as seeds and plants (FNS, 2012b), but SNAP benefits may not be used for the purchase of hot foods or any food sold for on-premises consumption. Nonfood items, such as tobacco products, pet foods, soaps, paper products, medicines and vitamins, household supplies, grooming items, and cosmetics, also are ineligible for purchase with SNAP benefits.

Several times in the history of SNAP, Congress has considered placing limits on the types of food that can be purchased (FNS, 2012b). However, it was concluded that designating foods as luxury or non-nutritious would be administratively costly and burdensome. In addition to Congress, cities and states have expressed interest in limiting the use of SNAP benefits to purchase certain foods and beverages (Barnhill, 2011). Because the criteria for SNAP purchases are federally regulated policies, however, any state that wishes to impose its own restrictions must apply to USDA for a waiver. To date, USDA has not approved any applications for waivers.

The discussion below illustrates the complexity of the issue of potentially restricting purchases made with program benefits. Potential impacts on participants' dietary intake and nutritional status must be weighed carefully against concerns about program administrative complexity and program access, as well as participants' freedom to make their own purchasing

decisions (Bhargava and Amialchuk, 2007; Dachner et al., 2010; Frazao et al., 2007; Lin and Carlson, 2010).

Studying the impact of SNAP on dietary quality presents a challenge because of selection bias; SNAP participants often are worse off than eligible nonparticipants with respect to financial and nutritional needs (Martin et al., 2012; Nord and Golla, 2009). Because SNAP participants and nonparticipants may not be sufficiently comparable, it is difficult to determine whether observed differences are due to the program or to unobserved differences between the groups, such as a family's economic situation, nutritional needs, health status, food security status, or motivation to enroll in the program. Evidence reviewed by the committee related to the association between SNAP and diet quality was inconclusive. Some studies suggest that SNAP improves the quality of the diet (Basiotis et al., 1998; Lee et al., 2006; Mabli et al., 2010; Rose et al., 1998), while others suggest that it does not (Chen et al., 2005; Cole and Fox, 2008; Fox et al., 2004; Wilde et al., 1999; You et al., 2009). Because of the confounding effect of a self-selection bias among the SNAP population, using analysis of diet quality to inform a definition of the adequacy of SNAP allotments may not be feasible.

Sugar-Sweetened Beverages

Most recently, debates over restrictions of SNAP purchases have focused largely on whether the purchase of sugar-sweetened beverages (SSBs) should be permitted (Brownell and Ludwig, 2011). Evidence is limited on patterns of beverage purchases among SNAP recipients. Andreyeva and colleagues (2012) collected grocery store scanner data from January to June 2011 and concluded that SSBs account for 58 percent of beverage purchases made by SNAP households. Their data and analysis are limited, however, by a regional focus on a single grocery chain in New England and the inclusion of only SNAP households with a history of recent participation in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Further, purchases of SSBs accounted for 5 and 7 percent of total grocery spending by SNAP and WIC households, respectively, and 9 and 7 percent, respectively, of total spending on all beverage refreshment categories (Andreyeva et al., 2012). Many arguments have been made for and against the policy of restricting SNAP purchases of SSBs (Brownell and Ludwig, 2011; FNS, 2007). The following discussion summarizes only those related to access to a healthy diet (e.g., whether allowing for the purchase of SSBs with SNAP benefits contributes directly to an unhealthy diet).

Economic theory suggests that restricting the purchase of some items, such as SSBs, might not impact the overall purchasing behavior of SNAP recipients. SNAP was designed to supplement participants' food purchases,

and most participants purchase food for home consumption with resources both from SNAP benefits and from other cash income (e.g., from employment and Social Security) (Fraker et al., 1995). In the hypothetical case that SNAP program rules were changed to prohibit the purchase of SSBs with SNAP benefits, theory predicts that participants would continue to purchase the same amount of SSBs as long as spending on these products was less than the amount of cash they typically spent on overall food purchases. Given that restricting the purchase of SSBs would be unlikely to change household purchases, proponents of the change argue that taxpayer dollars should not be used to purchase SSBs, while opponents argue that the administrative burden of restricting the purchase of SSBs would be too costly, and that such restrictions are paternalistic and could further stigmatize SNAP recipients (Brownell et al., 2009; Shenkin and Jacobson, 2010).

There are some important exceptions to this prediction about purchasing behavior. If a participant typically spent more on SSBs than the amount of cash typically used to supplement the household's food purchases, theory predicts that the household would reduce purchases of SSBs in response to such a restriction. Furthermore, items purchased with SNAP benefits are not subject to sales tax. SSBs are subject to sales tax in 33 states (mean tax rate = 5.2 percent) (Brownell et al., 2009). As a result, restricting SSB purchases with SNAP benefits would in some states increase the price for SSBs faced by SNAP households by making them liable for sales and excise taxes (McGranahan and Schanzenbach, 2011). Although there is little evidence on what effect this price increase would have on the consumption behavior of SNAP participants, Fletcher and colleagues (2010) found that current state soda taxes reduce adolescents' consumption modestly. Several other studies have demonstrated that a 10 percent increase in the price of SSBs could reduce consumption by 8 to 11 percent on average (Andreyeva et al., 2011; Bahl et al., 2003; Bergtold et al., 2004; Yen et al., 2004).

An extensive discussion of the literature related to SSB consumption and obesity risk is beyond the scope of this report. Of particular relevance to this report, however, are studies that specifically examine whether the purchase of SSBs is associated with poor diet quality; nonetheless, the committee was unable to identify research on this topic (IOM, 2012).

Hot Prepared Foods

Historically, SNAP has restricted the purchase of hot prepared foods in eligible food outlets because the program was designed to supplement purchases of food for home preparation and consumption. Challenges entailed in preparing food at home, however, have led some areas to start their own restaurant programs with FNS approval, such as Rhode Island's Food Access Prepared Meals Pilot Program (RIDHS, 2012) and California's

Restaurant Meals Program (Hodges and Emerson, 2012). The aim of these programs is to offer elderly, homeless, and disabled SNAP participants the opportunity to use their benefits for hot prepared meals at approved restaurants. California is one of only eight states taking advantage of the long-standing option to authorize certain restaurants to accept SNAP benefits for the elderly and disabled. It has certified 1,081 establishments, compared with 106 in Arizona and 47 in Michigan. No other state has more than 9 certified (FNS, 2012c). Other allowable meal services include drug and alcohol treatment centers, communal dining facilities for the elderly, and homeless meal providers (see Chapter 2 for further background on the restrictions on hot foods).

Use of Incentives to Promote a Healthy Diet for SNAP Participants

In addition to restriction or expansion of SNAP benefits, incentives offer another mechanism for encouraging the purchase of healthy foods. Evidence suggests that the use of financial incentives to promote health behavior change is effective (Kane et al., 2004; Volpp et al., 2009a,b). Incentives can be framed as rewards or as penalties. The behavioral economics literature suggests that financial incentives framed as rewards may have smaller effects than penalties of equivalent size (Arrow, 2004) because of "loss aversion" (Conrad and Perry, 2009, p. 359). For healthy behavior changes, however, such as dieting or smoking cessation, rewards have been shown to motivate behavior change effectively (Volpp et al., 2008, 2009a,b). While penalty incentives are widely used for behavior change, moreover, there is a lack of evidence directly comparing positive and negative incentives (Volpp et al., 2009a). The Farm Bill of 2008[10] authorized $20 million for pilot projects (e.g., Healthy Incentives Pilot [HIP]) to evaluate health and nutrition promotion in the SNAP program and to determine whether financial incentives provided to SNAP recipients at the point of sale increase the purchase of fruits and vegetables or other healthful foods (FNS, 2012d). The evaluation data for HIP were not available as this report was being written.

Retail Food Outlets

More than 231,000 retail outlets accepted SNAP benefits by the end of FY 2011, including a small number of restaurants that served the elderly, disabled, and homeless. One of the most dramatic changes over the years has been the participation by farmers' markets. In FY 2010, 6,132 farmers

[10]Food, Conservation, and Energy Act of 2008, Public Law 110-234, Sec. 4141 (May 22, 2008).

markets were operating, and 1,611 of these markets and individual farmers were authorized to accept SNAP benefits totaling $7,547,028. The number of markets and farmers increased by 263 percent over FY 2009, and redemptions increased by 49 percent over the previous 5 fiscal years (FNS, 2011a). Overall, 83 percent of all benefits in FY 2010 were redeemed by supermarkets or super stores, 6 percent by grocery stores, and 4 percent by convenience stores. Among food outlets where SNAP benefits are redeemed, however, only 17 percent are supermarkets or super stores, about 15 percent are grocery stores, 36 percent are convenience stores, 23 percent are combination stores, 2 percent are meal services, and 7 percent represent all other stores (FNS, 2012a).

As discussed in Chapter 1, to be authorized to accept SNAP benefits, a store must sell food for home preparation and offer for sale on a continuous basis a variety of food items that include meat, fish or poultry, breads or cereals, vegetables or fruits, and dairy products, with perishables (including frozen foods) in at least two of these groups. If a store does not meet this definition, it may be authorized if at least 50 percent of its total sales volume is in staple food sales.

USDA has been working to increase the number of farmers' markets that accept SNAP benefits and recently announced grants to expand wireless technology. Currently, markets receive free EBT point-of-sale devices only when redemptions are $100 or more per month. The $4 million in grants is the result of funding provided through the 2012 Consolidated and Further Continuing Appropriations Act.[11] These grants will help markets that lack access to phone lines or electricity. It should be noted that the committee acknowledges the concerns of feeding programs for the elderly about their problems with accepting SNAP donations in the EBT environment.[12] The difficulty of determining which outlets should be eligible to redeem benefits lies in the need to consider issues of access, pricing, quality, variety, and business integrity. This issue continues to attract attention by the program's administrators, client advocates, the retail food associations, and Congress.

Nutrition Education

Providing nutrition education to SNAP participants through SNAP-Education (SNAP-Ed) is not a program requirement. Nutrition education funding is available to states that opt to provide nutrition education to their SNAP participants. This component of the SNAP program has grown con-

[11]Consolidated and Further Continuing Appropriations Act, 2012, Public Law 112-55 (November 18, 2011).

[12]Personal communication, Enid Borden, Meals On Wheels, March 28, 2012.

siderably in the last two decades. In 1992 only seven states had approved nutrition education plans, and the federal share of funding was $661,000. By 2011, all states and the District of Columbia had approved plans, and the federal share of funding was $372 million (FNS, 2011b). However, the Healthy, Hunger-Free Kids Act of 2010 placed a cap on federal funding for SNAP-Ed of $375 million in FY 2011 and then indexed funding to inflation in future years.

As part of its examination of the evidence, the committee discussed the role of SNAP in providing nutrition education. Three alternative scenarios were highlighted in this discussion:

- SNAP should offer nutrition education because it serves one in seven Americans and therefore has an opportunity to impact national nutrition and health.
- Because SNAP participants have many of the same dietary problems experienced by the population as a whole, nutrition education should be undertaken equally for all Americans and funded accordingly (i.e., SNAP funds should not be diverted to nutrition education).
- The low-income population, as represented by SNAP participants, has special challenges and burdens that should be addressed through unique nutrition education approaches funded by the SNAP program.

SNAP nutrition education programs need more and better evaluation, including studies investigating optimal approaches to delivering educational messages. The committee did consider the role of nutrition education in the food purchasing decisions made by SNAP participants to better inform its assessment of the feasibility of defining the adequacy of SNAP allotments.

SUMMARY OF FINDINGS AND CONCLUSIONS

The evidence presented in this chapter highlights a number of challenges related to the calculation of SNAP benefits that have an impact on defining their adequacy. The committee's findings and conclusions based on this evidence focus on the maximum benefit guarantee, the BRR, and the net income calculation.

Maximum Benefit Guarantee

The TFP does not account for the time costs of food acquisition and preparation or for geographic variation in the cost of food. Limited evidence from community-level studies indicates that some SNAP households

with zero net income residing in high-cost locales with limited food access are unable to purchase foods within the cost and food choice assumptions of the TFP. The costs of foods that are value-added and have some built-in preparation time are not accounted for in the maximum benefit. The committee found compelling evidence on geographic price differences and time costs of food. Less compelling, however, is the evidence on how to incorporate these factors into the SNAP benefit formula, particularly for the maximum benefit. Moreover, because 80 percent of SNAP benefits are redeemed in supermarkets, the national prevalence of challenges similar to those identified in the community studies is unclear.

The committee concludes that specific areas of research could fill the evidence gap. These research areas include ways to incorporate time costs into the TFP; geographic price adjustments to the maximum benefit; and the effectiveness of alternative food plans, such as the Low-Cost Food Plan, in helping to achieve the program goals in areas where pricing variation negatively impacts the adequacy of SNAP allotments.

Benefit Reduction Rate

The committee's review of the evidence led to the finding that the five-decades-old assumption that the average household spends 30 percent of its income on food purchases is inconsistent with current spending patterns of American families, regardless of income. Today the average family spends about 13 percent of its income on food, and the current SNAP benefit formula is not aligned with this change.

From the evidence reviewed, the committee concluded that a BRR more in line with current spending patterns would result in increased incentive for households to combine work with SNAP participation because a lower BRR would reduce the penalty due to working. Holding other factors constant, moreover, a lower BRR would be expected to increase the SNAP allotment for those with positive net income, thereby enhancing the opportunity of these households to achieve improved food security and access to a healthy diet.

Calculation of Net Income

Evidence reviewed by the committee suggests that a substantial proportion of SNAP households face very high housing costs and that the cap on the excess shelter deduction is binding for nearly 30 percent of these households. Evidence is limited, however, on the extent to which the earned income deduction has an impact on the adequacy of SNAP allotments. As noted, the TFP does not incorporate the time costs of food preparation, and this is a concern in particular for households headed by a working single

parent, who faces significant time pressures as a result of his or her employment status. This pressure could be relieved somewhat by an earned income deduction that gave employed recipients a larger benefit that could be used to purchase more partially prepared foods, which in turn could shorten meal preparation time. At the same time, out-of-pocket expenses on transportation and clothing for work typically are higher for the employed. It is unclear whether the 20 percent earned income deduction is adequate to address all of these additional expenses.

Likewise, the medical deduction is allowed only for limited populations of the elderly and disabled, for out-of-pocket medical expenses. In light of the rising cost of health care and the increasing percentage of the nonelderly population with chronic diseases, coupled with reductions in employer-provided insurance and uncertainties associated with implementation of the Patient Protection and Affordable Care Act of 2010,[13] the impact of the burden of out-of-pocket medical costs on the purchasing power of SNAP allotments for the nonelderly and nondisabled is unknown.

The committee drew two conclusions from these findings. First, raising the shelter deduction cap to reflect geographic differences in housing more accurately would likely decrease the net income of SNAP households and thereby increase the amount of the allotment available for food purchases. Second, further evidence is needed on the effectiveness of the current earned income deduction in addressing the time costs of food preparation for working SNAP participants, as well as on whether the deduction for out-of-pocket medical expenses should be extended to all SNAP units regardless of age and disability status.

The currently available secondary and administrative data infrastructure is likely inadequate to address many of the research needs identified above. Some will require multisite, multiyear demonstration projects, coupled with rigorous evaluation, to obtain the necessary data, while others will require new survey data, especially on the development of a regional price index to provide a better understanding of geographic differences in the cost of foods.

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6

Conclusions and Recommendations

In its charge to the committee, the U.S. Department of Agriculture's Food and Nutrition Service (USDA-FNS) asked the committee to consider (1) the feasibility of establishing an objective, evidence-based, science-driven definition of the adequacy of Supplemental Nutrition Assistance Program (SNAP) allotments consistent with the program goals of improving food security and access to a healthy diet, as well as other relevant dimensions of adequacy; and (2) the data and analyses needed to support an evidence-based assessment of the adequacy of SNAP allotments.

The committee developed a framework (see Chapter 1, Figure 1-2) to use as a guide in assessing the feasibility of objectively defining the adequacy of SNAP allotments. This framework links to the committee's charge:

- the total resources available to the household to produce meals, including non-SNAP benefits, non-SNAP income, other program benefits and resources (e.g., emergency food assistance), and time;
- individual, household, and environmental factors that affect how resources can be used to obtain a healthy diet, including the foods purchased and consumed; and
- SNAP program characteristics that impact the process by which households achieve (or do not achieve) the program goals of food security and access to a healthy diet consistent with the goals of the *Dietary Guidelines for Americans*.

The committee reviewed and assessed the evidence base for objectively defining the adequacy of SNAP allotments and the data and analyses needed

to support this definition. Based on this assessment, the committee set the program goals of improving food security and access to a healthy diet as boundaries within which to identify the factors that should be examined as elements of this definition. The committee's conclusions about the role of these factors as components of an objective definition of the adequacy of SNAP allotments are presented below. The chapter then presents the committee's recommendations for how USDA-FNS should approach using these factors to formulate this definition, how it should monitor assessment of the adequacy of SNAP allotments, and what it should do to meet additional research needs. The chapter ends with a discussion of other research considerations and a brief summary. It should be noted that the committee did consider the impact of several assumptions of the Thrifty Food Plan (TFP), as well as aspects of how the plan is implemented, on the definition of the adequacy of SNAP allotments, but did not make recommendations for modifying these assumptions.

CONCLUSIONS

The committee's conclusions derive from its findings about the evidence reviewed, as presented in Chapters 3 through 5. These conclusions formed the basis for the recommendations that follow.

Conclusion 1: The Adequacy of SNAP Benefit Allotments Can Be Defined

Based on the available evidence, it is feasible to define objectively the adequacy of SNAP allotments. Doing so entails identifying the factors that affect the ability of participants to attain food security and access to a healthy diet. The committee's review of the evidence found that it is possible to identify those factors, and the committee has done so in its framework and in the following two conclusions and the findings that support them. The available evidence has some limitations, but it is possible to obtain the evidence needed for a science-driven definition of allotment adequacy. First, evidence must be taken into account on the degree to which specific individual, household, and environmental factors influence SNAP participants' purchasing power, given a dollar value of their SNAP benefits. Second, evidence must be taken into account on impacts of factors related to the computation of the dollar value of the SNAP allotment itself, as well as other SNAP program characteristics.

Conclusion 2: The Adequacy of SNAP Allotments Is Influenced by Individual, Household, and Environmental Factors

Evidence obtained by the committee in its data gathering workshop and in its review and assessment of the literature revealed that the opportunity

for SNAP participants to meet the program goals, given a dollar value of their SNAP benefits, is influenced by a number of individual, household, and environmental factors that impact the purchasing power of the allotments. The committee found that a definition of the adequacy of SNAP allotments must account for these factors according to the magnitude and significance of their influence on the allotments' purchasing power. Although SNAP allotments might be adequate in the absence of these factors, the evidence suggests that these factors can act as barriers to obtaining nutritious foods and preparing nutritious meals consistent with the assumptions of the TFP. The evidence on individual, household, and environmental factors that constrain the purchasing power of SNAP allotments is most robust for four factors:

- The SNAP allotment, which is based on the TFP, assumes the purchase of many basic, inexpensive, unprocessed foods and ingredients requiring substantial investment of the participants' time to produce nutritious meals. The evidence shows that the time requirements implicitly assumed by the TFP are inconsistent with the time available for most households at all income levels, particularly those with a single working head. By failing to account for the fact that SNAP participants, like other households, need to purchase value-added foods that save preparation time, the current value of the SNAP allotment substantially limits the flexibility and purchasing power of SNAP benefits.
- The food prices faced by SNAP participants vary substantially across geographic regions of the country and between rural and urban areas. However, SNAP benefits are adjusted only for Alaska and Hawaii. SNAP participants in locales with higher food prices are likely to find it more difficult than those in areas with lower prices to purchase the types and amounts of foods specified in the TFP as adequate to meet their needs for a nutritious diet. The evidence points further to a lack of data on the extent to which food prices influence the ability of SNAP participants to purchase nutritious foods.
- There is evidence that low-income households face higher transaction costs in achieving food security and access to a healthy diet relative to higher-income households. For example, low-income and minority populations are more likely than other groups to experience limited access to supermarkets and other large retail outlets, such as big-box stores, that offer a broad range of healthy foods at reasonable cost. Individuals without access to such venues experience greater disparity in the availability of healthy foods, such as fresh fruits and vegetables, in their neighborhood food

outlets. In addition, a lack of transportation infrastructure commonly leads to limited food access in small towns and rural areas.

- Nutrition education programs for low-income participants that include training in food purchasing and preparation skills appear to have some effectiveness in changing behavioral outcomes. This finding lends credence to the theory that skills are a limiting factor in the ability of some SNAP participants to maximize the purchasing power of the current SNAP allotments. However, existing evidence on the influence of nutrition knowledge and skills on the ability of SNAP participants to purchase and prepare nutritious foods consistent with the assumptions of the TFP is insufficient to support a conclusion about the relevance of these factors to an evidence-based definition of the adequacy of SNAP allotments.

Conclusion 3: The Adequacy of SNAP Allotments Is Influenced by Program Characteristics

The evidence suggests that a number of factors related to how the dollar value of SNAP allotments is calculated, as well as other SNAP program characteristics, can influence the feasibility of defining an adequate SNAP allotment. The evidence supports the conclusion that the maximum benefit, the benefit reduction rate, and the net income calculation have important impacts on the definition of the adequacy of SNAP allotments.

- **Maximum benefit guarantee—**The maximum SNAP benefit, currently based on assumptions of the TFP plus the temporary upward adjustment that occurred under the American Recovery and Reinvestment Act of 2009, may not always be sufficient to allow participants to purchase the food components and prepare the meals specified by the TFP for several reasons. As noted above, the time available for most households at all income levels, particularly those with a single working head, is insufficient to meet the assumptions of the TFP, and thus the allotments do not sufficiently account for the costs of purchasing foods that must be further prepared. Also as noted above, the TFP does not account for many types of geographic price variation. In addition, limited evidence suggests that some SNAP households with no net income as defined under the program and residing in high-cost locales with limited access to food outlets are unable to purchase the foods included in the market basket underlying the TFP. Although the committee found compelling evidence on the time costs of meal preparation and on geographic price variations, the evidence on how best to

incorporate these factors into the SNAP benefit formula is less compelling. The committee also identified as an issue affecting the adequacy of SNAP allotments the fact that the annual maximum benefit update occurs following a 16-month lag. The June cost of food is used to update the TFP in October, but then is not updated again until the following October, 16 months later. Because of the impact of inflation and other factors on food prices, this lag in the benefit adjustment can significantly reduce the purchasing power of SNAP allotments.

- **Benefit reduction rate—**The original assumption underlying the benefit reduction rate is that the average U.S. household spends 30 percent of its income on food. This assumption is outdated and inconsistent with the current average spending pattern across income levels in the United States of about 13 percent of pretax income spent on purchases of all food consumed, both at home and away. Although lower-income households spend a greater portion of their income on food (e.g., 16.8 percent in 2010) compared with higher-income households (e.g., 11.7 percent in 2010), the percentage is still substantially less than the 30 percent assumption currently used or the lower effective benefit reduction rate that results after other parts of the benefit formula have been applied. Evidence suggests that a lower benefit reduction rate more closely aligned with current household spending patterns would likely give households greater incentive to combine workforce participation with the receipt of SNAP benefits by reducing the penalty for working.
- **Calculation of the net income deduction—**The committee found evidence that several program characteristics used to determine net income and the monthly allotment may not adequately capture the impact of additional extraordinary household costs that reduce the allotment's purchasing power. Regarding the shelter deduction, considerable evidence shows that a substantial proportion of SNAP households face housing costs in excess of the current cap on the shelter deduction, which results in overestimation of the net income participants have available to purchase food. Deductions allowed for medical expenses for persons older than 60 and the disabled may influence the purchasing power of the allotment for those individuals but do not address out-of-pocket medical costs for nonelderly, nondisabled participants, although more evidence is needed to understand the impact of such expenses on the adequacy of SNAP allotments. Evidence is more limited on whether the current 20 percent earned income deduction is adequate to cover the additional expenses incurred by SNAP recipients who work.

Summary

In summary, the committee concluded that, using current evidence, it is feasible to define an adequate SNAP allotment as the extent to which participants have the opportunity to attain the program goals of improving food security and access to a healthy diet. Within these boundaries, certain factors need to be examined as elements of a definition of adequacy. Evidence reviewed by the committee indicates that a number of individual, household, and environmental factors can have an impact on the purchasing power of SNAP allotments, although more evidence is needed to fully understand the magnitude of the impact of these factors in influencing the adequacy of the current allotments. Further, evidence reviewed by the committee indicates that several features of the way SNAP allotments are calculated, such as how food prices and spending patterns are accounted for, must also be considered in defining adequacy. The committee notes that while defining the adequacy of SNAP allotments is feasible, implementing such a definition in practice would require the routine availability of data on all the elements of the definition.

RECOMMENDATIONS

The committee offers its recommendations in three areas. First, it recommends elements that should be included by USDA-FNS in an evidence-based, objective definition and measurement of the adequacy of SNAP allotments. Second, it recommends monitoring and assessment of the adequacy of SNAP allotments that is needed for evaluation and adjustment over time. Third, it recommends additional research and data needed to support an evidence-based definition of allotment adequacy. The subsequent section describes other research considerations for furthering the understanding of adequacy. Specific data and analytical challenges to the primary research effort are summarized in Chapters 3 and 4.

Defining and Measuring the Adequacy of SNAP Allotments

To define the adequacy of SNAP allotments objectively using currently available evidence requires consideration of a range of factors identified by the committee as likely to have an impact on the allotments' purchasing power. As a first step, the committee established a framework for considering factors that can have an impact on defining allotment adequacy. With this in mind, the committee offers the following recommendations.

Recommendation 1: In defining allotment adequacy, the U.S. Department of Agriculture (USDA) Food and Nutrition Service (FNS) should in-

clude consideration of the influence of specific individual, household, and environmental factors on Supplemental Nutrition Assistance Program (SNAP) participants' purchasing power, given the dollar value of their SNAP benefits. Specific individual, household, and environmental factors to consider in a definition of the adequacy of SNAP allotments are

- *Time*—USDA-FNS should recognize the cost-time trade-offs involved in procuring and preparing a nutritious diet. The dollar value of the Thrifty Food Plan (TFP), with its strong reliance on preparation of meals from basic ingredients, does not account for time constraints faced by most households at all income levels, particularly those with a single working head of household, which necessitate purchasing value-added or prepared foods with a higher cost. USDA-FNS should examine the impact of accounting for cost-time trade-offs, for example, by
  - applying a time adjustment multiplier to the cost of the TFP or reviewing options for adjustments to the current cost of the plan, and
  - adjusting the earned income deduction to reflect more accurately time pressures for participants who are working.
- *Geographic price variation*—USDA-FNS should recognize the substantial variation in food prices that exists across geographic regions of the contiguous United States and between rural and urban areas. USDA-FNS should examine possible approaches to accounting for this variation, such as through adjustments to the maximum benefit that take into account
  - pricing or price adjustments for food in high-cost (including urban and rural areas) as well as low-cost regions;
  - whether the shelter cap should be increased, particularly in high-cost regions; and
  - alternatives to the TFP, such as the Low-Cost Food Plan.
- *Access to food outlets*—USDA-FNS should assess the impact of limited access to certain food outlets (e.g., supermarkets) that may affect the ability of some SNAP participants to purchase a variety of healthy foods at reasonable cost. Evaluation and assessment of access barriers should include the degree to which, and for whom, they constrain the SNAP allotment that would otherwise be adequate to meet the program goals.

Recommendation 2: In defining allotment adequacy, the U.S. Department of Agriculture (USDA) Food and Nutrition Service (FNS) should also consider evaluating specific program characteristics that affect the allotment's actual dollar value, as well as the extent to which the

allotment is targeted to individual Supplemental Nutrition Assistance Program (SNAP) participants. Specific program characteristics to consider in a definition of allotment adequacy are

- ***Maximum benefit guarantee*—USDA-FNS should evaluate the need to**
  - **— adjust the current timing scheme for the cost-of-living adjustment to the Thrifty Food Plan (TFP) to reduce the 16-month lag in updates;**
  - **— update adjustments for economies of scale to reflect current data on the impact of family size on family food spending; and**
  - **— correct for misalignment in the assumptions of the TFP that serve as the basis for determining the maximum benefit guarantee to account for current lifestyle and meal patterns that include the purchase of food products that reduce the need for in-home preparation time.**
- ***Benefit reduction rate*—USDA-FNS should evaluate whether there is a need to adjust downward the current benefit reduction rate, which is currently set at 30 percent but has a lower effective rate, to reflect the current purchasing behaviors of U.S. households.**
- ***Calculation of net income*—USDA-FNS should evaluate whether there is a need to adjust the design of the net income calculation to better reflect the ability of SNAP participants to purchase food within the boundaries of their incomes. Particular attention should be given to the adequacy of the current earned income deduction; the cap on the excess shelter deduction; and the possibility of expanding the out-of-pocket medical deduction to nonelderly, nondisabled populations.**

Monitoring Assessment of the Adequacy of SNAP Allotments

The committee's findings suggest that an evidence-based definition of the adequacy of SNAP allotments requires ongoing monitoring of the ability of SNAP participants to use the allotments to achieve the program goals. To this end, it is important to know the proportion of SNAP participants that are more food secure and consuming healthier diets as a result of the program, and within what time frame. Understanding the impacts of SNAP benefits on these outcomes would contribute to the broader knowledge base used to define the adequacy of SNAP allotments.

Recommendation 3: To assess the correspondence between the definition of an adequate Supplemental Nutrition Assistance Program (SNAP) allotment and the attainment of the program goals, and to

adjust the definition of adequacy as information on influencing factors evolves, the U.S. Department of Agriculture (USDA) Food and Nutrition Service (FNS) should

- **Develop longitudinal datasets containing appropriate measures of food insecurity, access to a healthy diet, and SNAP participation as part of the evidence base it uses to define adequacy.**
- **Assess existing and establish new evaluation protocols that can measure the impact of SNAP participation on food security and access to a healthy diet, accounting for selection biases (e.g., that SNAP participants may be more likely to be food insecure than the general low-income population).**
- **Evaluate additional nutrition monitoring tools, including a standardized measurement tool with which to monitor and assess the ability of SNAP allotments to support a dietary pattern consistent with the *Dietary Guidelines for Americans*. The committee identified the Healthy Eating Index as one example of a measure that could be adapted to assess whether SNAP participants are meeting recommended dietary goals.**

Meeting Additional Research Needs

The committee identified several factors related to SNAP program participation that may affect whether some SNAP participants are able to meet the program goals and for which evidence is currently inadequate to fully assess their importance. These factors may affect either directly or indirectly the definition of the adequacy of SNAP allotments. The two broad areas in which additional research is needed to further develop the knowledge base for the potential use of these factors in defining allotment adequacy are educational programs that can help participants increase the purchasing power of the SNAP allotment and access to retail outlets and foods.

Recommendation 4: The U.S. Department of Agriculture (USDA) Food and Nutrition Service (FNS) should conduct further research in the following areas to support the definition of allotment adequacy:

- **To better assess how participants' understanding of nutrition and resource management skills affect the adequacy of Supplemental Nutrition Assistance Program (SNAP) allotments, USDA-FNS should**
  - **— assess whether and how strengthening the quality (content and delivery mechanisms) of education in nutrition and resource management skills can support allotment adequacy, for ex-**

ample, through educational outreach such as demonstration projects, and evaluate the level of funding needed to support such programs; and

— assess how effectively these educational programs align with the needs of SNAP participants and the program's potential to enhance the purchasing power of SNAP allotments.

- **To evaluate the impact of access to retail outlets on the opportunity for SNAP participants to be food secure and to make nutritious food choices, USDA-FNS should conduct periodic regional cross-sectional surveys to gather information on the cost and availability of foods that are consistent with the recommendations of the *Dietary Guidelines for Americans*.**

OTHER RESEARCH CONSIDERATIONS

The committee's recommendations pertain only to the evidence needed to objectively define the adequacy of SNAP allotments and the data and analyses needed to support an evidence-based assessment of adequacy. Two factors emerged, however, that the committee wishes to acknowledge as issues that may have a secondary impact on defining allotment adequacy. Current levels of evidence are insufficient to support any recommendation for defining, measuring, or monitoring allotment adequacy based on these factors. However, these research questions were compelling enough to warrant their consideration as areas for other research that could contribute to a fuller understanding of the range of factors that influence allotment adequacy. These factors are (1) the influence of incentivizing purchases of healthier foods on access to a healthy diet and (2) documentation and assessment of the relative cost impact of ready-to-eat prepared foods on the total cost of a market basket of healthy foods.

First, the committee encourages USDA's continued support for rigorous independent investigations evaluating the role of both incentive and restriction approaches to encouraging healthy food purchases in supporting the program goals. The potential for such approaches to influence program participation and attendant food security and to encourage SNAP participants to purchase and consume foods that would contribute to a healthy diet has not been established. Independent research is needed to assess the effects, both direct and indirect, including ethical, financial, and other considerations, associated with implementing such a policy. Second, the committee encourages research efforts by USDA-FNS to determine pricing variation among ready-to-eat prepared, partially prepared, and unprepared foods and assess the impact of this variation on the ability of SNAP participants to maximize their benefits to achieve the program goals.

SUMMARY

The committee's recommendations for defining, measuring, and monitoring the adequacy of SNAP allotments within the context of participants' ability to meet the program goals are derived from its review and analysis of a broad range of evidence. The committee concluded from its findings that the adequacy of SNAP allotments is influenced by individual, household, and environmental factors, as well as program characteristics. Its recommendations are structured to (1) assist USDA-FNS in establishing an objective definition of the adequacy of SNAP allotments, taking into consideration the evidence for these factors and (2) identify specific data and analysis requirements to support an evidence-based assessment of allotment adequacy.

Appendix A

Acronyms, Abbreviations, and Terms

ACRONYMS AND ABBREVIATIONS

AHEI	Alternate Healthy Eating Index
AI	Adequate Intake
ARRA	American Recovery and Reinvestment Act of 2009
ATUS	American Time Use Survey
BLS	Bureau of Labor Statistics
BMI	body mass index
BRR	benefit reduction rate
CACFP	Child and Adult Care Food Program
CFSM	Core Food Security Module
CNPP	Center for Nutrition Policy and Promotion, U.S. Department of Agriculture
CPI	Consumer Price Index
CPS	Current Population Survey
DGA	*Dietary Guidelines for Americans*
DRIs	Dietary Reference Intakes
EAR	Estimated Average Requirement
EBT	Electronic Benefit Transfer
EFNEP	Expanded Food and Nutrition Education Program
ERS	Economic Research Service, U.S. Department of Agriculture

FNS	Food and Nutrition Service, U.S. Department of Agriculture
FSP	Food Stamp Program
FY	fiscal year
HEI	Healthy Eating Index
HHS	U.S. Department of Health and Human Services
HIP	Healthy Incentives Pilot
IOM	Institute of Medicine
mg	milligram
NHANES	National Health and Nutrition Examination Survey
NSLP	National School Lunch Program
RDA	Recommended Dietary Allowance
RFS	Recommended Food Score
SBP	School Breakfast Program
SNAP	Supplemental Nutrition Assistance Program
SNAP-Ed	Supplemental Nutrition Assistance Program-Education
SoFAS	solid fats and added sugars
SSB	sugar-sweetened beverage
SSI	Supplemental Security Income
TANF	Temporary Assistance for Needy Families
TFP	Thrifty Food Plan
USDA	U.S. Department of Agriculture
WIC	Special Supplemental Nutrition Program for Women, Infants, and Children

TERMS

Allotment	The amount of the SNAP benefit issued to a certified eligible participant.
Benefit reduction rate	The rate at which the maximum SNAP allotment is reduced per dollar of income.

Body mass index (BMI)	An indirect measure of body fat, calculated as the ratio of a person's body weight in kilograms to the square of a person's height in meters. In children and youth, assessment of BMI is based on growth charts for age and gender and is referred to as BMI for age.
Cost-of-living adjustment	Adjustment of SNAP maximum allotments, deductions, resources, and income eligibility standards at the beginning of each federal fiscal year based on changes in the cost of living.
Dependent care deduction	The deduction received by a household with expenses related to caring for a dependent while other household members attend school, work, or seek employment.
Dietary Guidelines for Americans	A federal report of the latest dietary guidance for the American public based on current scientific evidence and medical knowledge. The *Dietary Guidelines* are issued jointly by the U.S. Department of Health and Human Services and the U.S. Department of Agriculture and revised every 5 years.
Dietary Reference Intakes (DRIs)	A set of nutrient reference values established by the Food and Nutrition Board of the Institute of Medicine. They include the Estimated Average Requirement, the Recommended Dietary Intakes, the Adequate Intake, and the Tolerable Upper Intake Level.
Earned income deduction	To account for the cost of being employed (e.g., transportation and clothing), 20 percent of earned income is disregarded in calculations of a household's net income on which the benefit level is based.
Economies of scale	Food costs for the Thrifty Food Plan are based on individuals in the context of a reference four-person family. For households that are larger or smaller than the reference, per person food costs are adjusted using an adjustment factor.
Electronic Benefit Transfer (EBT)	An electronic system that allows recipients to authorize transfer of their government benefits from a federal account to a retailer's account to pay for products received.

Energy density	The ratio of calories (energy) to total nutrients in a food. An energy-dense food has a high number of calories relative to its nutrient content.
Excess shelter deduction	The deduction received by households that spend 50 percent or more of their income on housing costs (e.g., rent/mortgage, taxes, interest, utilities) after other deductions have been calculated. The deduction was capped at $459 in fiscal year 2012 for households in the 48 contiguous states that do not contain an elderly or disabled member.
Food coupon	Any coupon, stamp, or type of certificate issued pursuant to the provisions of the Food Stamp Act of 1964; its use was restricted to purchases of food (no tobacco or alcohol products) from retail food stores approved for participation in the Food Stamp Program. The Electronic Benefit Transfer card has replaced food coupons.
Food desert	Defined by the U.S. Department of Agriculture's Economic Research Service as a low-income census tract with a substantial number or share of residents with low levels of access to retail outlets selling healthy and affordable foods.
Food Security Supplement	A national survey of a sample of households derived from those eligible for the basic Current Population Survey (CPS). Its purpose is to obtain information about household food expenditures, food program participation, food sufficiency, ways of coping with food insecurity, and concerns about food security.
Gross income	A household's total monthly income before deductions are applied.
Gross income limit	An amount of monthly gross income below which households are eligible to receive SNAP benefits, determined by household size. The limit must be equal to or less than 130 percent of the national poverty threshold.
Healthy Eating Index (HEI)	A measure of diet quality that assesses conformance to federal dietary guidance.

Maximum benefit	The benefit received by households whose net income is zero or negative. It varies by household size.
Medical deduction	The deduction received by households with a disabled member or member age 60 and over whose monthly out-of-pocket medical expenses exceeed $35.
Minimum benefit	In fiscal year 2012, $16 per month for one- and two-person households.
National Health and Nutrition Examination Survey (NHANES)	A comprehensive survey designed to assess the health and nutritional status of adults and children in the United States. The survey interview includes demographic, socioeconomic, dietary, and health-related questions. The examination component consists of medical, dental, and physiological measurements, as well as laboratory tests administered by highly trained medical personnel.
National poverty threshold	Issued by the U.S. Department of Health and Human Services and used to determine the monthly net income limits for SNAP.
National School Lunch Program (NSLP)	The program under which participating schools operate a nonprofit lunch program in accordance with 7 Code of Federal Regulations (CFR) Part 210.
Net income	A household's total monthly income after deductions are applied.
Net income limit	An amount of monthly net income below which households are eligible to receive SNAP benefits, determined by household size. The limit must be equal to or less than 100 percent of the national poverty threshold.
Price index	An index that tracks inflation by measuring price changes.
Reference family	Used as the basis for determining the maximum SNAP benefit, derived from the Thrifty Food Plan market basket for age-sex groups. The reference family comprises a male and female aged 19-50 and two children aged 6-8 and 9-11.

Resource limit	An amount of countable resources below which households are eligible for SNAP. Countable resources include cash on hand and resources that can easily be converted to cash (e.g., savings/checking accounts, stocks, bonds). In fiscal year 2012, the resource limit is $2,000, or $3,250 for households with at least one adult aged 60 or older or disabled.
School Breakfast Program (SBP)	The program under which participating schools operate a nonprofit breakfast program in accordance with 7 CFR Part 220.
Standard deduction	The deduction received by all households, intended to cover emergency and unusual household expenses. It varies by household size (e.g., in fiscal year 2012, $147 for households of one to three people, $155 for households of four or more).
Supplemental Security Income (SSI)	A federally funded, need-based disability program for adults and children that provides a monthly cash benefit to eligible participants.
Take-up rate	The percentage of eligible households that actually participate in SNAP.
Thrifty Food Plan	A minimal-cost model food plan that reflects currently applied nutrition standards and guidance, the nutrient content and cost of food, and the food consumption patterns of low-income Americans.

Appendix B

Open Session with Sponsors

OPEN SESSION AGENDA

Committee on Examination of the Adequacy of Food Resources and SNAP Allotments

Open Session
Keck Center, Room 101
The National Academies, Washington, DC 20001

January 17, 2012

1:00 p.m.	**Welcome, Introductions, and Purpose of the Session** *Julie Caswell, Committee Chair*
1:05	**Perspectives from Sponsors** *Eric Williams, U.S. Department of Agriculture, Food and Nutrition Service (USDA-FNS)* *Anita Singh, USDA-FNS*
1:45	**Committee Discussion with Sponsors**
2:30	**Adjourn Open Session**

Appendix C

Workshop Agenda

DEFINING THE ADEQUACY OF SNAP ALLOTMENTS

A Workshop for the Committee on Examination of the Adequacy of Food Resources and SNAP Allotments

House of Sweden
2900 K Street, NW
Washington, DC 20007

March 28, 2012

8:00-8:45 a.m. Registration

INTRODUCTION

8:50 **Welcome**
Julie Caswell, Chair, Committee on Examination of the Adequacy of Food Resources and SNAP Allotments

SESSION 1: APPROACHES TO DETERMINING NUTRITIONAL ADEQUACY AMONG SNAP PARTICIPANTS

Moderated by James Ziliak, Committee on Examination of the Adequacy of Food Resources and SNAP Allotments

9:00	**Defining Nutritional Adequacy in Food Assistance Programs: Food-Based vs. Nutrient-Based Assessment** *Suzanne Murphy, Emeritus, University of Hawaii Cancer Center*
9:20	**Food Insecurity, SNAP Participation, and Alleviation of Hunger** *Craig Gundersen, University of Illinois*
9:40	**Food Insecurity Measures and Assessment of Nutritional Adequacy** *Ed Frongillo, University of South Carolina*
10:00	**Q&A**
10:30	**Break**

SESSION 2: FOOD PURCHASE AND CONSUMPTION BEHAVIOR IN LOW-INCOME HOUSEHOLDS

Moderated by Sara Bleich, Committee on Examination of the Adequacy of Food Resources and SNAP Allotments

11:00	**Influence of Special Needs on Purchase Decisions of Low-Income Households** *Hilary Seligman, University of California, San Francisco*
11:20	**Tracking Purchase Behavior of Low-Income Households: Assessment of Data Needs** *Ephraim Leibtag, U.S. Department of Agriculture, Economic Research Service (USDA-ERS)*
11:40	**Q&A**
12:00 p.m.	**Break for Lunch**

SESSION 3: DESIGN OF THE SNAP BENEFIT

Moderated by Barbara Laraia, Committee on Examination of the Adequacy of Food Resources and SNAP Allotments

1:00	**The SNAP Benefit Formula: Overview and Policy Perspectives** *Parke Wilde, Tufts University*
1:20	**Geographic Differences in SNAP Benefit Formula: Lessons from the Supplemental Poverty Measure** *Trudi Renwick, U.S. Census Bureau*
1:40	**Q&A**

SESSION 4: CHALLENGES TO ACHIEVING NUTRITIONAL ADEQUACY FOR SNAP PARTICIPANTS

Moderated by Sheila Mammen, Committee on Examination of the Adequacy of Food Resources and SNAP Allotments

2:00	**Choices Consumers Make to Stretch Food Dollars** *Elaine Waxman, Feeding America, Chicago, Illinois*
2:20	**Ways SNAP Participants Supplement Their Benefits: Challenges Faced by Seniors** *Enid Borden, Meals On Wheels, Alexandria, Virginia*
2:40	**Q&A**
3:00	**Break**

SESSION 5: CHALLENGES TO DEFINING THE ADEQUACY OF SNAP ALLOTMENTS

Moderated by Jamie Dollahite, Committee on Examination of the Adequacy of Food Resources and SNAP Allotments

3:30	**Food Prices and Selection Options in Food Stores and Markets Serving Low-Income Households** *Helen Jensen, Iowa State University*
3:50	**Time Challenges: Food Preparation** *George Davis, Virginia Tech*
4:10	**Administrative Challenges: Accessing SNAP Benefits** *Stacy Dean, Center for Budget and Policy Priorities*
4:30	**Q&A**
5:00	**Public Comments**
5:30	**Final Comments and Adjourn** *Julie Caswell, Chair, Committee on Examination of the Adequacy of Food Resources and SNAP Allotments*

Appendix D

Approach to Literature Review

LITERATURE SEARCH STRATEGY

To identify primary literature and review the most relevant scientific publications available, staff initially conducted general searches on topics relevant to subject areas identified in the committee's statement of task. Using the results of this primary search, staff then developed key search terms based on relevance to the study objectives. Searches were limited to English-language publications. After the initial search, staff designed a comprehensive search strategy in consultation with librarians at the George E. Brown Jr. Library of the National Academies. Search terms incorporated relevant MeSH (Medical Subject Headings) terms, as well as terms from the EMBASE thesaurus. Databases searched included Academic Search Premier, Agricola, Congressional Research Service, EconLit, ERIC, MEDLINE, NTIS, PsycINFO, and Web of Science (Science Citation Index and Social Science Citation Index). Database searches also included publications from the National Bureau of Economic Research and the U.S. Department of Agriculture's Economic Research Service. Table D-1 provides an example of how the searches were conducted; only a subset of terms from the overall search are shown because including the entire search was impractical.

Staff limited the searches to publications dated 2000 and later. The initial search retrieved more than 1,100 citations, which were then sorted into predefined topics identified by the committee. The topical search terms included

- access to food,
- cost of food,

TABLE D-1 Example of Searches Using Key Words to Identify Relevant Literature

Search Number	Search Terms	Number of Hits
1	food stamp program	360
2	("food stamp?" or "supplemental nutrition assistance" or "thrifty food plan"),sh,de,hw,to,ab.	1,663
3	(SNAP adj3 {benefit? or assistance or secur* or insecure* or food)). ti,ab.	16
4	or/1-3	1,666
5	limit 4 to (English language and yr=*2000 –Current*)	377
6	remove duplicates from 5	366
7	food availability/	680
8	food security/	1,221
9	((food adj access*) or (food adj2 (insufficien* or insecure* or secur*))). Ti,ab.	2,319
10	Or/7-9	3,429
11	6 and 10	55
12	income/ or household income/ or net cash income/	3,253
13	exp social welfare/	825
14	welfare.ti,ab,de,hw,sh.	13,865

- economic insecurity,
- food choice and cultural preferences,
- food policy,
- health and nutrition effects, and
- program access.

ORGANIZATION OF THE LITERATURE

Relevant references obtained from the initial search were screened and categorized according to the research taxonomy shown in Box D-1. The committee organized the publications obtained from its search into three focus areas:

1. content area,
2. design of research study, and
3. source of paper/publication.

The topics within each focus area of the taxonomy were then expanded. Key citations were selected by committee members and annotated by staff. Reference lists of key citations were provided in tabulated format to facilitate the committee's review and selection of critical publications for inclusion in this report.

BOX D-1
Research Taxonomy

Content Area

A. Access to food
   a) Physical access/transportation
   b) Financial access
   c) Total resources available and resources available for food
B. Cost of food
   a) Regional differences
   b) Urban/suburban/rural differences
   c) Nutrient density (less vs. more healthy foods)
C. Food choice/cultural preferences
   a) Effect of individual and group characteristics (e.g., age, race/ethnicity, chronic illness, individual/group preferences)
   b) Food choices related to the *Dietary Guidelines for Americans* (DGA) and nutrient density
   c) At home/away from home
D. Food policy
   a) SNAP program design (program characteristics)
      - % income spent on food, nutrition education within SNAP, allowed retail outlets, restrictions and incentives
   b) Other food policies as they impact SNAP
      - DGA, other food assistance programs (Special Supplemental Nutrition Program for Women, Infants and Children [WIC]; National School Lunch Program [NSLP]/School Breakfast Program [SBP]); cash-out states, access to farmers' markets and farm stands
E. Program access/participation
F. Health and nutrition effects of SNAP participation or nonparticipation
   a) Health (effect on chronic and acute illness, e.g., diabetes, immunity)
   b) Nutrition and dietary intake
      - Measures of nutritional adequacy
      - Incidence and prevalence of nutritional adequacy
   c) Obesity
G. Economic/food insecurity effects of SNAP participation or nonparticipation
   a) Measures of economic/food insecurity
   b) Incidence and prevalence of economic/food insecurity

Design of Research

A. Descriptive/observational study
   a) Quantitative reports (including secondary data analysis)
   b) Qualitative reports
B. Intervention impact study
   a) Quasi-experimental design (including secondary data analysis)
   b) Experimental design
C. Literature review or policy brief
   a) Systematic reviews
   b) Meta-analyses

Source of Paper/Publication

A. Journal article
B. Government report
C. Other (e.g., nonpublished or working paper, report for advocacy group or foundation)

EVALUATION OF THE LITERATURE

To evaluate the results of the literature search, the committee first used the organizational scheme described above to consider (1) the validity and (2) the generalizability of the studies and publications identified in its research taxonomy. Although the committee appreciates the range of evidence types and the strengths and weaknesses of various methodological approaches, it determined that the most useful approach was to examine research questions relevant to its statement of task with observational studies conducted in a real-world context. From this perspective, the quantitative approach of the randomized controlled trial was deemed limited because of the use of an artificial setting and the need to control variables that may have application to understanding and interpreting consumer behavior. Relevant experimental studies were not identified in the search and thus were not included in the evidence review.

The types of research studies that provided the most valid evidence for examining the behavior of participants in food assistance programs were field experiments and survey-based studies. The committee identified a range of observational evidence, including population-based surveys and impact studies based on secondary data analysis, that reflected the complexity of variables relevant to the outcomes of interest, as well as the generalizability of the evidence to pertinent research questions. The committee considered the merits of these studies on the basis of the methodological approach used and the overall quality of the research. Additional support for the findings from observational studies was obtained from evidence-based reviews, meta-analyses, and qualitative studies.

Finally, in addition to the body of peer-reviewed evidence from journal publications, the committee considered peer-reviewed evidence from government reports, in particular, relevant reports from the U.S. Department of Agriculture's (USDA's) Economic Research Service, as well as nonreviewed publications from stakeholder and nongovernmental organizations. Although government reports undergo a rigorous peer review, the process differs from that for peer-reviewed journal articles in that the review is not blinded. Specifically, the Office of Management and Budget *Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by Federal Agencies* state: "In general, an agency conducting a peer review of a highly influential scientific assessment must ensure that the peer review process is transparent by making available to the public the written charge to the peer reviewers, the peer reviewers' names, the peer reviewers' report(s), and the agency's response to the peer reviewers' report(s)."[1] While

[1] *Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by Federal Agencies*, Federal Register, Volume 67, Issue 24, p. 5465 (February 5, 2002).

the committee did not give these types of evidence equal weight with peer-reviewed journal publications, it took them into account as part of the totality of evidence because of the additional insight they provided into the behavioral aspects of participation in food assistance programs.

Appendix E

Questions Related to the Statement of Task

The U.S. Department of Agriculture (USDA) and Food and Nutrition Services (FNS) asked the committee to consider in its review of evidence questions related to the two primary dimensions of its task. These included individual and household factors such as knowledge about diet and food preparation; food preferences and cultural influences on food choices; and environmental factors such as variation in food prices by locale and geographical access to food outlets. Evidence related to the sponsor's questions is discussed in the report as noted below each question.

Questions related to the feasibility of defining Supplemental Nutrition Assistance Program (SNAP) adequacy include

- What are collateral costs associated with food acquisition and preparation that need to be considered?
  —Collateral costs associated with food acquisition and preparation such as time, knowledge and skills, availability of food preparation and storage equipment, access to transportation, and access to food outlets are discussed in the section "Household and Individual Factors" in Chapter 4.
- Are there economies of scale that adjust SNAP allotments for households of various sizes and incomes? What are they?
  —Information about economies of scale can be found in Chapter 5 under the section "Household Size and the Benefit Level" and in Box 5-1.

- What special dietary considerations (cultural foods, vegetarian diets, etc.) need to be addressed?
  —Chapter 4 discusses taste preferences, personal and social factors, and acculturation in the section "Food Choice."
- How does variation in cost of food by location or local economy (regional vs. urban vs. suburban) need to be addressed?
  —The section "Geographic and Regional Variations in Food Prices" in Chapter 4 describes variations in food prices across geographic regions of the United States. Tables 4-1, 4-2, and 4-3 display data on the variation in market prices among certain food groups and across market groups. Recommendation 1 in Chapter 6 addresses geographic price variability as a factor to consider in defining the adequacy of the SNAP allotment.
- Do variation in economic fluctuation and price change over the course of a federal fiscal year need to be factored into a definition? If so, how?
  —Variations in food prices over time due to changes in the availability of supply of raw commodities, changes in farm level production costs, changes in food processing costs, and seasonal variation are described in the section "Variation in Food Prices Over Time Due to Inflationary Factors" in Chapter 4. Chapter 2 describes the lag time from the calculation of the Thrifty Food Plan cost and adjustments to the maximum SNAP benefit to account for inflation. Recommendation 2 in Chapter 6 addresses economic fluctuation over the federal fiscal year as a factor to consider in defining the adequacy of the SNAP allotment.
- What demographic, compositional, and other household variations need to be considered?
  —The section "Household and Individual Factors" in Chapter 4 includes a discussion of household variations that need to be considered, such as family structure, acculturation, and employment status. Recommendation 1 in Chapter 6 identifies specific household variations that should be considered in defining the adequacy of the SNAP allotment.

Questions related to determining the data and analyses needed to support an evidence-based assessment of SNAP adequacy were

- Are the data available to establish an operational definition? Are there limitations? If data are not available, how can they be obtained?
  —Discussions of data needs and limitations are located in Chapter 3 in the section "Data and Analytical Challenges to Assessing

SNAP Allotment Adequacy" and in Chapter 4 in the section "Data and Analytical Challenges."

- What kinds of analyses are necessary to create and validate an operational definition?
  —The section "Other Research Considerations" in Chapter 6 addresses the data and analyses needed to support an evidence-based assessment of adequacy.
- What methodological strategy is needed to compare the adequacy of current and alternative SNAP benefit definitions?
  —Chapter 5 addresses the methodological strategy to compare the adequacy of current and alternative SNAP benefit definitions, particularly the sections under "Evidence on the Components of the SNAP Benefit Formula." Recommendation 2 in Chapter 6 addresses specific program factors to consider as components of a definition of SNAP allotment adequacy.

Appendix F

Questions on the Core Food Security Module

Food Insecurity Question	Asked of Households With Children	Asked of Households Without Children
1. "We worried whether our food would run out before we got money to buy more." Was that **often, sometimes,** or never true for you in the last 12 months?	X	X
2. "The food that we bought just didn't last and we didn't have money to get more." Was that **often, sometimes,** or never true for you in the last 12 months?	X	X
3. "We couldn't afford to eat balanced meals." Was that **often, sometimes,** or never true for you in the last 12 months?	X	X
4. "We relied on only a few kinds of low-cost food to feed our children because we were running out of money to buy food." Was that **often, sometimes,** or never true for you in the last 12 months?	X	
5. In the last 12 months, did you or other adults in the household ever cut the size of your meals or skip meals because there wasn't enough money for food? (**Yes**/No)	X	X

continued

Food Insecurity Question	Asked of Households With Children	Asked of Households Without Children
6. "We couldn't feed our children a balanced meal, because we couldn't afford that." Was that **often, sometimes,** or never true for you in the last 12 months?	X	
7. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food? (**Yes**/No)	X	X
8. (If yes to Question 5) How often did this happen—**almost every month, some months but not every month,** or in only 1 or 2 months?	X	X
9. "The children were not eating enough because we just couldn't afford enough food." Was that **often, sometimes,** or never true for you in the last 12 months?	X	
10. In the last 12 months, were you ever hungry, but didn't eat, because you couldn't afford enough food? (**Yes**/No)	X	X
11. In the last 12 months, did you lose weight because you didn't have enough money for food? (**Yes**/No)	X	X
12. In the last 12 months, did you ever cut the size of any of the children's meals because there wasn't enough money for food? (**Yes**/No)	X	
13. In the last 12 months did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food? (**Yes**/No)	X	X
14. In the last 12 months, were the children ever hungry but you just couldn't afford more food? (**Yes**/No)	X	
15. (If yes to Question 13) How often did this happen—**almost every month, some months but not every month,** or in only 1 or 2 months?	X	X
16. In the last 12 months, did any of the children ever skip a meal because there wasn't enough money for food? (**Yes**/No)	X	

Food Insecurity Question	Asked of Households With Children	Asked of Households Without Children
17. (If yes to Question 16) How often did this happen—**almost every month, some months but not every month,** or in only 1 or 2 months?	X	
18. In the last 12 months did any of the children ever not eat for a whole day because there wasn't enough money for food? (**Yes**/No)	X	

NOTE: Responses in bold indicate an "affirmative" response.
SOURCE: ERS, 2012.

REFERENCE

ERS (Economic Research Service). 2012. *U.S. household food security survey module: Three-stage design, with screeners*. http://www.ers.usda.gov/datafiles/Food_Security_in_the_United_States/Food_Security_Survey_Modules/hh2012.pdf (accessed August 23, 2012).

Appendix G

Key Recommendations of the *Dietary Guidelines for Americans*

The *Dietary Guidelines for Americans, 2010* (USDA and HHS, 2011) provide U.S. consumers with information and guidance on how to follow a healthy eating pattern, emphasizing nutrient density over energy density, as well as physical activity to help achieve and maintain a healthy weight. The *Dietary Guidelines* are designed to be used in developing educational materials and to serve as a resource for policy makers in the design and implementation of nutrition-related programs, including federal nutrition assistance and education programs. The *Dietary Guidelines* also serve as the basis for consumer information intended to facilitate and promote healthy eating and physical activity so as to support normal growth and development and reduce the risk for diet-related chronic disease.

KEY REVISIONS IN THE 2010 GUIDELINES

The 2010 *Dietary Guidelines* recognize that a major obstacle to meeting nutritional needs among a growing proportion of American households (nearly 15 percent) is the inability to acquire adequate foods to meet their needs, while other Americans consume too few of certain nutrients even though they have the resources to obtain a healthy diet. The 2010 *Dietary Guidelines* further identify a concurrent issue: food components commonly consumed in excess by individuals across life stages that may increase the risk of chronic disease. These components include sodium, solid fats, added sugars, and refined grains. Replacing nutrient-dense foods with these components creates a challenge to achieving recommended nutrient intake and calorie control.

Evidence cited in the *Dietary Guidelines* shows that more than half the added sugars in the American diet come from a handful of foods: sugar-sweetened soft drinks, energy drinks, and sports drinks (37.5 percent); fruit drinks (10.5 percent); candy (6.1 percent); and sugars and honey (3.5 percent). Unlike other food components that contribute excess calories, these products contribute to intake of calories but provide no essential nutrients. Thus the *Dietary Guidelines* strongly recommend reducing consumption of calories from added sugars.

KEY RECOMMENDATIONS IN THE 2010 GUIDELINES

Balancing Calories to Manage Weight

- Prevent and/or reduce overweight and obesity through improved eating and physical activity behaviors.
- Control total calorie intake to manage body weight. For people who are overweight or obese, this will mean consuming fewer calories from foods and beverages.
- Increase physical activity and reduce time spent in sedentary behaviors.
- Maintain appropriate calorie balance during each stage of life—childhood, adolescence, adulthood, pregnancy and breastfeeding, and older age.

Foods and Food Components to Reduce

- Reduce daily sodium intake to less than 2,300 milligrams (mg), and further reduce intake to 1,500 mg among persons who are 51 and older and those of any age who are African American or have hypertension, diabetes, or chronic kidney disease. The 1,500 mg recommendation applies to about half of the U.S. population, including children and the majority of adults.
- Consume less than 10 percent of calories from saturated fatty acids by replacing them with monounsaturated and polyunsaturated fatty acids.
- Consume less than 300 mg per day of dietary cholesterol.
- Keep *trans* fatty acid consumption as low as possible by limiting foods that contain synthetic sources of trans fats, such as partially hydrogenated oils, and by limiting other solid fats.
- Reduce intake of calories from solid fats and added sugars.
- Limit the consumption of foods that contain refined grains, especially refined-grain foods that contain solid fats, added sugars, and sodium.

- If alcohol is consumed, it should be consumed in moderation—up to one drink per day for women and two drinks per day for men—and only by adults of legal drinking age.

Foods and Nutrients to Increase

Individuals should meet the following recommendations as part of a healthy eating pattern while staying within their caloric needs:

- Increase fruit and vegetable intake.
- Eat a variety of vegetables, especially dark-green and red and orange vegetables and beans and peas.
- Consume at least half of all grains as whole grains. Increase whole-grain intake by replacing refined grains with whole grains.
- Increase intake of fat-free or low-fat milk and milk products, such as milk, yogurt, cheese, or fortified soy beverages.
- Choose a variety of protein foods, which include seafood, lean meat and poultry, eggs, beans and peas, soy products, and unsalted nuts and seeds.
- Increase the amount and variety of seafood consumed by choosing seafood in place of some meat and poultry.
- Replace protein foods that are higher in solid fats with choices that are lower in solid fats and calories and/or are sources of oils.
- Use oils to replace solid fats where possible.
- Choose foods that provide more potassium, dietary fiber, calcium, and vitamin D, which are nutrients of concern in American diets. These foods include vegetables, fruits, whole grains, and milk and milk products.

Women capable of becoming pregnant should

- Choose foods that supply heme iron, which is most readily absorbed by the body; additional iron sources; and enhancers of iron absorption, such as vitamin C–rich foods.
- Consume 400 micrograms (mcg) per day of synthetic folic acid (from fortified foods and/or supplements) in addition to food forms of folate from a varied diet.

Women who are pregnant or breastfeeding should

- Consume 8 to 12 ounces of seafood per week from a variety of seafood types.
- Because of their high methyl mercury content, limit white (alba-

core) tuna to 6 ounces per week, and do not eat the following four types of fish: tilefish, shark, swordfish, and king mackerel.
- If pregnant, take an iron supplement, as recommended by an obstetrician or other health care provider.

Individuals aged 50 and older should

- Consume foods fortified with vitamin B_{12}, such as fortified cereals, or dietary supplements.

Building a Healthy Eating Pattern

- Select an eating pattern that meets nutrient needs over time at an appropriate calorie level.
- Account for all foods and beverages consumed and assess how they fit within a total healthy eating pattern.
- Follow food safety recommendations when preparing and eating foods to reduce the risk of foodborne illness.

REFERENCE

USDA and HHS (U.S. Department of Agriculture and U.S. Department of Health and Human Services). 2010. *Dietary Guidelines for Americans, 2010*. 7th ed. Washington, DC: Government Printing Office. http://www.health.gov/dietaryguidelines/2010.asp (accessed June 11, 2012).

Appendix H

Biographical Sketches of Committee Members

Julie A. Caswell (*Chair*) is professor of resource economics and department chair in the Department of Resource Economics at the University of Massachusetts Amherst. Her research focuses on understanding the operation of domestic and international food systems, with particular interest in the economics of food quality and labeling, especially for safety and nutrition, and international trade. Dr. Caswell has provided her expertise to the United Nations Food and Agriculture Organization and the Organisation for Economic Co-operation and Development. In 2011, Dr. Caswell was elected Fellow of the Agricultural and Applied Economics Association (AAEA) and received the Award for Outstanding Accomplishments in Research and Creative Activity from the University of Massachusetts Amherst. She has held numerous senior positions with the AAEA, is currently President-Elect, and has taught graduate courses in Brazil, Italy, Poland, and Spain. Dr. Caswell held a Fulbright Distinguished Lectureship at the University of Tuscia in Viterbo, Italy, April-June 2009. Dr. Caswell has served on the IOM Committee on the Implications of Dioxin in the Food Supply, the Committee on Nutrient Relationships in Seafood, the Food Forum, the Committee on Review of the Food and Drug Administration's Role in Ensuring Safe Food, and the Committee on Food Safety and Other Consequences of Publishing Establishment Specific Data. Currently she is a member of the National Research Council (NRC) and IOM Committee for the Review of Food Safety and Defense Risk. Dr. Caswell received her PhD jointly in agricultural economics and economics from the University of Wisconsin–Madison.

Sara A. Bleich is assistant professor of health policy management at Bloomberg School of Public Health at Johns Hopkins University. Her research focuses on the intersection between public policy and obesity prevention/control. She is particularly interested in disparities in practice patterns of obesity care and novel environmental strategies designed to reduce caloric consumption or increase physical activity. Her past work experience includes the Measurement Group (Research Associate), RAND Corporation (Summer Associate Program), and the Harvard Initiative for Global Health (Research Associate). Dr. Bleich is a current recipient of a K01 Career Development Award from National Heart, Lung, and Blood Institute to explore racial disparities in physician practice patterns and patient self-management of obesity and of a Robert Wood Johnson Foundation Healthy Eating Research Award to conduct a store-based intervention to reduce sugar-sweetened beverage consumption among low-income, black adolescents. She was recently elected to the Faculty Senate at the Bloomberg School of Public Health and is the Co-Director of the MPH Concentration in Health Systems and Policies. Dr. Bleich earned a PhD in health policy from Harvard University.

Noel Chavez is associate professor of community health sciences and co-director of the maternal and child health program in the School of Public Health at the University of Illinois at Chicago. Her research interests center on the health and nutritional status of Latinos and other underrepresented groups, particularly children and families. She also studies the role of culture in nutrition and health and changes in health and nutrition status that occur with migration, and the effects of such changes on health services usage. Dr. Chavez has a research stream in the area of community food security. She is also an investigator on a National Institutes of Health–funded study to evaluate cultural and ethnic differences in survey responses in four ethnic groups. Dr. Chavez serves on the Food and Nutrition Science Committee and the Latino Caucus of the American Public Health Association and the Public Health Nutrition, Research Nutrition, and Hunger and Environmental Nutrition practice groups and the Latinos and Hispanics in Dietetics and Nutrition Interest Group of the American Dietetic Association. Dr. Chavez received a PhD from St. Louis University and an MS from Colorado State University.

Jamie Dollahite is associate professor and director of Food and Nutrition Education in Communities in the Division of Nutritional Sciences at Cornell University. She has expertise in the area of nutrition education for limited-resource audiences that is designed to prevent obesity and chronic disease. Dr. Dollahite leads the Expanded Food and Nutrition Education Program for New York State and works closely with the Supplemental Nutrition As-

sistance Program-Education, both in the state and nationally. Her research is closely integrated with the outreach provided by these programs. Currently, she leads a community-based intervention study to build parenting skills among limited-resource participants and support healthy lifestyles and prevent childhood obesity. This project also seeks to build the capacity of local extension staff to work with agency partners to make community-level environmental changes. A recently funded study will investigate the impacts of food choices among children resulting from changes to school cafeterias in combination with outreach to parents. Other integrated research includes several projects designed to identify effective, evidence-based practices in nutrition education programming for the limited-resource population. These include an innovative staff training model as well as other studies of program management and delivery practices. Additional areas of interest and recent research include the development of valid outcome measures to assess behavioral change among participants in these programs, and access to nutritional care for low-income people with chronic disease. She is a registered dietitian. Dr. Dollahite received her PhD from the University of Texas at Austin.

Philip Gleason is a senior fellow at Mathematica Policy Research in Princeton, New Jersey. He is an expert in evaluation design and random assignment and has directed many studies related to education initiatives and federal nutrition programs. Dr. Gleason's past research has included a study of the dynamics of participation in the Food Stamp Program and an investigation into the relationship between food stamp receipt and participants' dietary intakes. He has also directed a number of studies of the National School Lunch and School Breakfast Programs. In the area of education, Dr. Gleason directs an evaluation of the Knowledge Is Power Program (KIPP) for the KIPP Foundation and recently led a rigorous lottery-based experimental evaluation of charter schools for the U.S. Department of Education. He is currently leading a study of the distribution of highly effective teachers in school districts around the country. Dr. Gleason publishes regularly in peer-reviewed journals, with recent articles appearing in the *Journal of Policy Analysis and Management, Evaluation Review, Journal of the American Dietetic Association*, *Journal of Agricultural Economics*, and *Demography*. He is on the board of editors of the *Journal of the Academy of Nutrition and Dietetics*, and has recently coauthored a series of articles for that journal on the methodological aspects of publishing nutrition research. He holds a PhD in economics from the University of Wisconsin–Madison.

Barbara A. Laraia is associate professor in the School of Public Health, Public Health Nutrition Program, at the University of California, Berkeley.

She is a public health nutrition investigator with a special interest in the relationships between food policy, the food environment, and health. She has expertise in qualitative methods, program evaluation, community-based research, and nutritional epidemiology. Her research focuses on household food security status and neighborhood effects on diet, weight, perinatal outcomes, and other maternal and child health issues, especially among vulnerable populations. Dr. Laraia's current projects include measurement issues of the food and physical activity environments; influences of the food environment on diet and weight among postpartum women; and understanding the role that tiendas (Latino grocery stores) play in diet quality among Latinos. She has previously served on the IOM planning committee for the Workshop on the Public Health Effects of Food Deserts. She is a registered dietitian. Dr. Laraia received her PhD and MPH from the University of North Carolina School of Public Health.

Sheila Mammen is professor of resource economics at the University of Massachusetts Amherst. Her research interest lies in the economic well-being of families and households with special emphasis on low-income households. U.S. Department of Agriculture (USDA)-funded, multi-state, multi-disciplinary research projects on which she has participated include Rural Low-Income Families: Tracking Their Well-Being and Functioning in the Context of Welfare Reform (1998-2008) and Interactions of Individual, Family, Community, and Policy Contexts on the Mental and Physical Health of Diverse Rural Low-Income Families (2009-2013). She is currently the PI on two USDA/National Institute of Food and Agriculture–funded projects, Core Health Messages: A Strategy to Improve the Health and Well-Being of Rural, Low-Income Families and Dissemination of Core Health Messages: Using Community Based Participatory Research to Strengthen the Health of Rural, Low-Income Families. Her publications are focused primarily on low-income, rural families in the areas of labor supply decisions, use of the Earned Income Tax Credit, coping ability in light of persistent food insecurity, satisfaction with life, and poverty dynamics. Dr. Mammen holds an MS from Purdue University and a PhD from the University of Missouri–Columbia.

Mary K. Muth is director of the Food and Nutrition Policy Research Program at RTI International in North Carolina. She is also an adjunct associate professor in the Department of Agricultural and Resource Economics at North Carolina State University. She has expertise in economic impact analysis as well as applications of industrial organization, applied welfare analysis, econometrics, and statistical analysis in evaluating food, agricultural, and nutrition policy and providing information for policy development. Dr. Muth also specializes in developing computer models and

databases to support economic impact analysis of regulations, developing industry survey instruments, analyzing industry survey data, and analyzing food purchase and consumption data. Dr. Muth has an MS in agricultural economics from Cornell University and a PhD in economics from North Carolina State University.

Bonny O'Neil is retired from the U.S. Department of Agriculture's Food and Nutrition Service, where she was Associate Deputy Administrator of the Supplemental Nutrition Assistance Program (SNAP) for more than 15 of her 35 years with the program. She worked closely with Congress to craft Food Stamp legislation through the 1977 Farm Bill and has overseen many changes and improvements in the Food Stamp Program. She implemented many expansions of the program and led implementation of the Electronic Benefit Transfer program that replaced paper coupons. As a member of the senior management team at the Food and Nutrition Service, Ms. O'Neil was involved in the operations of all the nutrition programs, including the Special Supplemental Nutrition Program for Women, Infants, and Children and the school feeding programs. Ms. O'Neil holds a BA from Ohio Wesleyan University and is a graduate of the Federal Executive Institute's program for government senior executives.

Diane W. Schanzenbach is an associate professor in the School of Education and Social Policy at Northwestern University and faculty research fellow at the National Bureau of Economic Research. Her research interests include education policy, child health, and food consumption. She has recently been investigating the impact of school accountability policies and school reform policies on student performance and other outcomes. In addition, she has used the Project STAR experiment to study the impact of classroom composition and class size on student outcomes. Dr. Schanzenbach is also studying the impact of school policies such as school lunches and availability of recess and gym class on child obesity. Her work on food stamps has measured how households alter their consumption of food, leisure time, and other goods when they receive food stamp benefits, and whether the benefits improve the health of recipients. Dr. Schanzenbach received a PhD in economics from Princeton University.

James P. Ziliak is Gatton Endowed Chair in Microeconomics and director of the Center for Poverty Research at the University of Kentucky. He served as assistant and associate professor of economics at the University of Oregon and has held visiting positions at the Brookings Institution, University College London, University of Michigan, and University of Wisconsin–Madison. His research expertise is in the areas of labor economics, poverty, food insecurity, and tax and transfer policy. Recent

projects include the causes and consequences of hunger among older Americans; trends in earnings and income volatility in the United States; trends in the antipoverty effectiveness of the social safety net; the origins of persistent poverty in America; and regional wage differentials across the earnings distribution. He is editor of *Welfare Reform and Its Long Term Consequences for America's Poor*, published by Cambridge University Press (2009) and *Appalachian Legacy: Economic Opportunity after the War on Poverty*, published by Brookings Institution Press (2012). Dr. Ziliak received an MA and a PhD from Indiana University at Bloomington.