



Access to Affordable and Nutritious Food: Measuring and Understanding Food Deserts and Their Consequences

Report to Congress



This report was prepared by the Economic Research Service (ERS), the Food and Nutrition Service (FNS), and the Cooperative State Research, Education, and Extension Service (CSREES) of the U.S. Department of Agriculture under the direction of Michele Ver Ploeg of ERS. Contributors include Vince Breneman, Tracey Farrigan, Karen Hamrick, David Hopkins, Phil Kaufman, Biing-Hwan Lin, Mark Nord, Travis Smith, and Ryan Williams of ERS; Kelly Kinnison, Carol Olander, and Anita Singh of FNS; Elizabeth Tuckermanty of CSREES; Rachel Krantz-Kent and Curtis Polen of the Bureau of Labor Statistics; and Howard McGowan and Stella Kim of the U.S. Census Bureau.



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Abstract

The Food, Conservation, and Energy Act of 2008 directed the U.S. Department of Agriculture to conduct a 1-year study to assess the extent of areas with limited access to affordable and nutritious food, identify characteristics and causes of such areas, consider how limited access affects local populations, and outline recommendations to address the problem. This report presents the findings of the study, which include results from two conferences of national and international authorities on food deserts and a set of commissioned research studies done in cooperation with the National Poverty Center at the University of Michigan. It also includes reviews of 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. The study uses a variety of analytical methods and data to assess the extent of limited access to affordable and nutritious food and characteristics of areas with limited access. Overall, findings show that a small percentage of consumers are constrained in their ability to access affordable nutritious food because they live far from a supermarket or large grocery store and do not have easy access to transportation. Urban core areas with limited food access are characterized by higher levels of racial segregation and greater income inequality. In small-town and rural areas with limited food access, the lack of transportation infrastructure is the most defining characteristic. Existing data and research are insufficient to conclusively determine whether areas with limited access have *inadequate* access.

Acknowledgments

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Summary

Increases in obesity and diet-related diseases are major public health problems. These problems may be worse in some U.S. communities because access to affordable and nutritious foods is difficult. Previous studies suggest that some areas and households have easier access to fast food restaurants and convenience stores but limited access to supermarkets. Limited access to nutritious food and relatively easier access to less nutritious food may be linked to poor diets and, ultimately, to obesity and diet-related diseases. Congress, in the Food, Conservation, and Energy Act of 2008, directed the U.S. Department of Agriculture (USDA) to conduct a 1-year study to assess the extent of the problem of limited access, identify characteristics and causes, consider the effects of limited access on local populations, and outline recommendations to address the problem.

This report presents the findings of the study, which include results from two conferences of national and international authorities on food deserts and a set of commissioned research studies done in cooperation with the National Poverty Center at the University of Michigan. It also includes reviews of 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. A variety of analytical methods and data are used to assess the extent of limited access to affordable and nutritious food and characteristics of areas with limited access.

Findings

Access to a supermarket or large grocery store is a problem for a small percentage of households. Results indicate that some consumers are constrained in their ability to access affordable nutritious food because they live far from a supermarket or large grocery store and do not have easy access to transportation. Three pieces of evidence corroborate this conclusion:

- Of all households in the United States, 2.3 million, or 2.2 percent, live more than a mile from a supermarket and do not have access to a vehicle. An additional 3.4 million households, or 3.2 percent of all households, live between one-half to 1 mile and do not have access to a vehicle.
- Area-based measures of access show that 23.5 million people live in low-income areas (areas where more than 40 percent of the population has income at or below 200 percent of Federal poverty thresholds) that are more than 1 mile from a supermarket or large grocery store. However, not all of these 23.5 million people have low income. If estimates are restricted to consider only low-income people in low-income areas, then 11.5 million people, or 4.1 percent of the total U.S. population, live in low-income areas more than 1 mile from a supermarket.
- Data on time use and travel mode show that people living in low-income areas with limited access spend significantly more time (19.5 minutes) traveling to a grocery store than the national average (15 minutes). However, 93 percent of those who live in low-income areas with

limited access traveled to the grocery store in a vehicle they or another household member drove.

These distance and time-based measures are national estimates that do not consider differences between rural and urban areas in terms of distance, travel patterns, and retail market coverage.

Urban core areas with limited food access are characterized by higher levels of racial segregation and greater income inequality. In small-town and rural areas with limited food access, the lack of transportation infrastructure is the most defining characteristic.

These area- or distance-based results are in line with a nationally representative survey of U.S. households conducted in 2001. Responses to direct questions about food access show that nearly 6 percent of all U.S. households did not always have the food they wanted or needed because of access-related problems. More than half of these households also lacked enough money for food. It is unclear whether food access or income constraints were relatively greater barriers for these households.

Supermarkets and large grocery stores have lower prices than smaller stores. A key concern for people who live in areas with limited access is that they rely on small grocery or convenience stores that may not carry all the foods needed for a healthy diet and that may offer these foods and other food at higher prices. This report examines whether prices of similar foods vary across retail outlet types and whether the prices actually paid by consumers vary across income levels. These analyses use proprietary household-level data that contain information on food items purchased by approximately 40,000 demographically representative households across the United States. Results from these analyses show that when consumers shop at convenience stores, prices paid for similar goods are, on average, higher than at supermarkets.

Low-income households shop where food prices are lower, when they can. Findings also show that food purchases at convenience stores make up a small portion of total food expenditures (2 to 3 percent) for low-income consumers. Low- and middle-income households are more likely to purchase food at supercenters, where prices are lower. Administrative data on SNAP benefit redemptions from 2008 show that 86 percent of SNAP benefits were redeemed at supermarkets or large grocery stores. Research that considers the prices paid for the same food across household income levels indicates that while some of the very poorest households—those earning less than \$8,000 per year—may pay between 0.5 percent and 1.3 percent more for their groceries than households earning slightly more, households earning between \$8,000 and \$30,000 tend to pay the lowest prices for groceries, whereas higher income households pay significantly higher prices.

The study also examined food shopping behavior and the types of food purchased for SNAP participants and other low-income households. Data from the 1996/1997 NFSPS show that SNAP participants were, on average, 1.8 miles from the nearest supermarket. However, the average number of miles both SNAP participants and eligible nonparticipants traveled to the store most often used was 4.9 miles. These same data show that SNAP

participants who did not shop at supermarkets purchased less noncanned fruit, noncanned vegetables, and milk than SNAP participants who shopped frequently at a supermarket.

Easy access to all food, rather than lack of access to specific healthy foods, may be a more important factor in explaining increases in obesity. Many studies find a correlation between limited food access and lower intake of nutritious foods. Data and methods used in these studies, however, are not sufficiently robust to establish a causal link between access and nutritional outcomes. That is, other explanations cannot be eliminated as the cause of lower intake. A few studies have examined food intake before and after healthy food options become available (either within existing stores or because new stores opened). The findings are mixed—some show a small but positive increase in consumption of fruits and vegetables, while others show no effect.

The causal pathways linking limited access to nutritious food to measures of overweight like Body Mass Index (BMI) and obesity are not well understood. Several studies find that proximity of fast food restaurants and supermarkets are correlated with BMI and obesity. But increased consumption of such healthy foods as fruits and vegetables, low-fat milk, or whole grains does not necessarily lead to lower BMI. Consumers may not substitute away from less healthy foods when they increase their consumption of healthy foods. Easy access to all food, rather than lack of access to specific healthy foods, may be a more important factor in explaining increases in BMI and obesity.

Understanding the market conditions that contribute to differences in access to food is critical to the design of policy interventions that may be effective in reducing access limitations. Access to affordable and nutritious food depends on supply (availability) and consumer demand. Consumer behavior, preferences, and other factors related to the demand for some foods may account for differences in the types of foods offered across different areas. Food retailer behavior and supply-side issues such as higher costs to developing stores in underserved areas may also explain variation across areas in which foods are offered and what stores offer them. If high development costs serve as a barrier to entry for supermarkets in some areas with low access, then subsidy programs or restructured zoning policies may be effective solutions. If consumer demand factors, such as inadequate knowledge of the nutritional benefits of specific foods, contribute to differences in access by reducing demand, then a public health campaign may be a preferred strategy. Several local and State-level efforts are underway that could provide the basis for a better understanding of the types of interventions that may work best.

Food has been used as a tool for community development. Projects such as farmers' markets, community gardens, promotion of culturally specific foods for ethnic minorities and Native Americans, local food production and promotion, youth agricultural and culinary training programs, and many other types of programs have all been implemented in a variety of settings, both urban and rural. USDA's Community Food Projects Competitive Grant program has much experience in funding and nurturing such programs.

The current state of research is insufficient to conclusively determine whether some areas with limited access have inadequate access. Future research should consider improved methods to measure access levels, availability, and prices of foods faced by individuals and areas. More research is needed to understand how access, availability and price affect the shopping and consumption behaviors of consumers. Data linking information on the types of foods consumers purchase and eat with measures of consumers' levels of access and the prices they face could help explain the economic consequences of food access. Studies that use improved methods and data to determine how food access affects diet, obesity, and other health outcomes are also needed to help explain the health consequences of food access.

Methods

To conduct the analysis of the extent of food deserts, a comprehensive database was developed that identified the location of supermarkets and large grocery stores within the continental United States. Food access was estimated as the distance to the nearest supermarket or large grocery store. The analysis was refined by examining households without vehicles and specific socio-demographic subpopulations drawn from the 2000 Census. Multivariate statistical analysis was applied to identify the key determinants of areas with low access to supermarkets and large grocery stores.

Research also examined national-level data on questions of household food adequacy and access from the 2001 Current Population Survey. This information was complemented with national-level data on time spent traveling to grocery stores from the 2003-07 American Time Use Survey. To consider the economic consequences of limited access, ERS also analyzed demand for certain nutritious foods for a sample of participants in the Supplemental Nutrition Assistance Program (SNAP, formerly the Food Stamp Program), using data from the National Food Stamp Program Survey (NFSPS) of 1996/1997. Variation in prices for similar foods purchased at different store types, as indicated by hedonic models and data from the 2006 Nielsen Homescan panel, was also estimated.

ERS collaborated with other agencies and institutions to complete this study. USDA's Food and Nutrition Service (FNS) compiled information on an extensive body of work examining food access for SNAP and other low-income households. USDA's Cooperative State Research, Education, and Extension Service (CSREES) provided information on the Community Foods Projects and lessons learned in the administration of the projects.

The national-level food desert analysis was complemented by a review of existing literature and the commissioning of additional studies by experts in the field. A workshop held in October 2008 convened leading experts in the study of retail food and grocery store access, key stakeholders from community development organizations, grocery retailer organizations, other government agencies, congressional members and staff, and related public interest groups. The workshop included presentations and panel discussions of such topics as defining and describing dimensions of food deserts, implications of low access for food and nutrition assistance programs,

consequences of food deserts, and programs and policies to mitigate the adverse effects of food deserts.

USDA, in cooperation with the National Poverty Center at the University of Michigan, commissioned several studies by experts in food access to better understand concepts of low access to affordable and nutritious foods and the degree to which access varies across different types of areas. The intent of these papers was to describe characteristics of the food environment and the demographic, economic, and health conditions that typify areas with low food access and to compliment the national-level findings with more detailed and local-level information. Results from studies were presented in a conference.

USDA, in cooperation with the Institute of Medicine of the National Academies, conducted a 2-day workshop in January 2009 on the public health implications of food deserts. Workshop presentations covered methods for assessing and research findings on the impacts of food deserts on such outcomes as diet (including examination of specific foods, such as fruit and vegetable consumption and intake of high-energy, low-nutrient foods), prevalence of obesity and overweight; and diseases associated with poor diets. In addition, presentations covered promising strategies for mitigating the impacts of food deserts that have been suggested, implemented, or are in the planning stages. The workshop provided the basis for the review of the public health literature.