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

Shelly Ver Ploeg
Economic Research Service, USDA

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Why might food deserts matter?

• Related to diet and health outcomes such as obesity and diet-related diseases
• Related to health disparities across race/ethnicity and income levels
• May be related to food insecurity
• SNAP benefits can be stretched farther if participants can access lower prices
Farm Bill food deserts definition

“Areas in the U.S. with limited access to affordable and nutritious food, particularly such an area composed of predominantly low-income neighborhoods and communities.”
Methods

• Proximity to supermarkets and large grocery stores.
  – SNAP authorized store directory merged with TDLinx directory

• Individual characteristics
  – Low-income individuals (income ≤ 200% poverty)
  – Households without access to a vehicle

• Area characteristics
  – Areas where more than 40% of the population has income below 200% of poverty
Methods

• Continental U.S. divided into 1 kilometer square grids.
  – Socioeconomic Data and Applications Center data from 2000 Census of Population.

• Distance from grid center to nearest supermarket or large grocery store.

• Overall and separately by urbanicity.
Caveats

• Overestimate the extent of food deserts?
  – Excludes smaller and non-traditional stores, farmers markets, and mobile markets.
  – Home to store measure; not travel pattern measure.

• Underestimate the extent of food deserts?
  – Definition of ‘large’ grocery store is old.
  – No indication of quality, quantity or price in these supermarkets and large grocery stores.

• Relative access of healthy to unhealthy food may be as important – “food swamps”

• Poverty measure not geographically adjusted
Overview of results

• Access to a supermarket or large grocery store is a problem for a small percentage of the population,

• Depending on which measure is used, limited access to a supermarket or large grocery store impacts between 2 – 8 percent of the population.
Area-based Results

• 23.5 million people live in low income areas 1+ mile from a supermarket (8.4%).

• But only half of those who live in low-income areas have low income.

• If consider only those with low incomes in low-income areas, then 11.5 million (4.1%) are more than 1 mile from a supermarket.
Supermarket Access and Vehicle Access

• More than a mile from a supermarket and no vehicle:
  – 2.4 million households (2.3%)

• Between ½ and 1 mile without a vehicle:
  – An additional 3.4 million households (3.3%)
Corroborating evidence
2001 Current Population Survey

- 5.1% of all households did not always have the kinds of foods they wanted and said it was too hard to get to the store or to a store that carries the kinds of foods they wanted.

- 0.6% of all households did not have enough to eat and said it was too hard to get to the store.

- A total of 5.7% of all households sometimes do not have enough to eat or enough of the foods they want because of access problems.
Average time spent traveling to grocery stores (shortest one-way)

- Total population: 15.0 minutes
- Low-income areas
  - < 0.5 miles: 15.5
  - 0.5 – 1.0 miles: 14.1
  - 1.0+ miles: 19.5
- Higher-income areas
  - < 0.5 miles: 13.3
  - 0.5 – 1.0 miles: 12.5
  - 1.0+ miles: 15.9

Source: ERS, Census, BLS estimates using 2003-2007 ATUS.
Price differences across store format and income

We used Nielsen Homescan data on food purchases to understand prices paid by consumers.

- Examined prices paid across store formats (supermarkets, convenience stores, club stores, and other retailers) for 3 goods:
  - Milk
  - Ready-to-eat cereal
  - Bread

- Examined the prices paid for the same UPC-coded food item across consumer income levels. (Brouda, Leibtag, Weinstein, *JPE*, 2009)
Convenience store prices are higher than supermarket prices

- Milk – 5% higher
- Cereal – 25% higher
- Bread – 10% higher

- On sale purchases and coupon use are frequently reported at convenience stores and can offset the price premium.
Low-income consumers shop for the best prices when they can

• Convenience store purchases make up only 2-3% of low-income consumers’ total food spending.

• Low-income shoppers are more likely to purchase food at supercenters, which offer the lowest prices.
Low-income consumers shop for the best prices when they can

- Consumers with annual incomes between $8,000 – $30,000 pay the least.

- Consumers with the lowest incomes (less than $8,000) pay slightly more (0.5 – 1.3 percent more).

- Higher income consumers ($100,000 or more) pay the most (2 – 3 percent more).
What are the effects of limited access on diet and health?

- Many studies show correlation between limited access and lower consumption of fruits and vegetables, poor diet, and BMI/obesity.

- Few studies show causal relationships.
  - U.K. pre/post-store opening studies
  - Spatial econometric approach
    Chen, Florax, & Snyder (2009)
What are the implications for public policy?

• Supply (e.g. store development costs) or demand conditions (consumer income, knowledge and preferences) could contribute to differences in access to stores.

• Public policy may need to address both supply and demand side concerns.
Examples of public interventions to increase access

- Healthy Bodegas, Health Bucks and Green Carts in NYC
- Pennsylvania Fresh Food Financing Initiative
Healthy Food Financing Initiative

• President’s proposed FY2011 budget calls for $400 million to encourage financing of healthy food options in distressed urban and rural communities.
  – Funding through USDA, Treasury, and HHS.

• Many types of projects may be considered (e.g. supermarkets, farmers markets, reconfigured small stores)
U.S. Food Environment Atlas

• Publicly available mapping tool to show variation in food environment indicators.
• Assembles statistics on 3 broad categories:
  – Food choices
  – Health and well-being
  – Community characteristics
• About 90 indicators
  – Most at the county level
Food Environment Atlas

http://www.ers.usda.gov/foodatlas/
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Shelly Ver Ploeg: sverploeg@ers.usda.gov
Additional information about study

- National Poverty Center (NPC) commissioned papers on Economic Concepts and Characteristics of Food Access (6 case studies)
  http://www.npc.umich.edu/

- IOM/NRC Workshop on the Public Health Effects of Food Deserts
  The Public Health Effects of Food Deserts: Workshop Summary
  http://www.iom.edu/CMS/3788/59640/70463.aspx