Bringing Healthy Foods Home: Examining Inequalities in Access to Food Stores

Healthy Eating Research
Building evidence to prevent childhood obesity

A Research Brief, July 2008

Obesity is widely recognized as one of the most pressing health threats to families and children across the country. During the past four decades, the obesity rate for children ages 6 to 11 years has more than quadrupled (from 4 to 17 percent) and has more than tripled for adolescents ages 12 to 19 years (from 5 to 17 percent).[1–3] Almost one-third of American youth—over 23 million children and adolescents—are either overweight or obese.[1, 4] Many studies have confirmed that the rates of overweight, obesity and related health problems are highest and rising fastest for Hispanic, African-American and Native American youth living in low-income communities.[5]

The foods and beverages children and teens consume at home account for the majority of their total energy intake and have a great influence on overall dietary quality. The alarming rates of childhood and adolescent obesity suggest there is a need to examine what foods are accessible for families to purchase and serve in their homes. Eating healthier foods–more fresh fruits and vegetables, for instance–helps to reduce the risk of obesity and chronic disease.[6–8] Families and children from low-income communities and racial/ethnic minority backgrounds are less likely to have diets that meet nutrition guidelines for good health and are more likely to be obese.[1, 9–17] Inequalities in access to stores that stock healthy foods may contribute to these disparities. Understanding the possible connections among access to healthy food, what families prepare and eat at home, and obesity can point toward potential environmental and policy solutions.

Where do people in the United States shop for food to prepare and eat at home—and what do they tend to buy?

Each week, the average U.S. household spends about $100 on groceries and makes two shopping trips.[18] Households with children spend about $118 per week and households without children spend about $80.[18] Americans shop at a variety of different food stores, including supermarkets, supercenters, grocery stores and convenience stores (see Table 1).[19] Shoppers report that their top considerations when choosing stores are cleanliness, produce and meat quality, accurate shelf tags and low prices.[18] Supermarkets and supercenters tend to offer the greatest variety of healthy, high-quality products at the lowest cost,[20–24] and shoppers generally prefer these stores to smaller grocery stores and convenience stores.[18]

Table 1. **Food-store Categories***

- **Supermarket:** A full-line self-service store generating a sales volume of $2 million or more annually. These stores typically offer a service deli and bakery.
- **Supercenter:** A large store offering a wide variety of food and non-food merchandise under a single roof. Typically as much as 40 percent of the space is devoted to food merchandise.
- **Grocery store:** A retail store offering a line of dry goods, canned goods and non-food items in addition to some perishable food items.
- **Convenience store:** A small, higher-margin store offering a limited selection of staple groceries, non-foods and other convenience food items (e.g., ready-to-eat foods). The store may or may not also sell gasoline.

* Definitions of food store categories are not universally applied in research.

Adapted from: Food Marketing Institute Definitions. 2008. Available at *www.fmi.org/facts_figs/?fuseaction=superfact*; North American Industry Classification System. 2007. Available at *www.census.gov/epcd/www/naics.html*.

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How is food-store access related to diet and to the risks for obesity?

While supermarkets generally offer the greatest variety and value in food for home preparation and consumption,[20–24] convenience stores mostly stock prepared, high-calorie foods and little fresh produce.[25] A number of studies have found that neighborhood residents who have better access to supermarkets tend to have healthier diets.[20, 26–30] In addition, some research has found that having greater access to supermarkets and limited access to convenience stores may reduce the risk for obesity.[31–36]

Diet

Research among adults[27–30, 37] and children[38, 39] has examined how neighborhood access to different types of food stores is associated with consumption of fruits and vegetables, the percentage of total calories from fat and overall diet quality. In general these studies have found that better access to supermarkets is related to having a healthier diet. For example, one study among white and black Americans found that adults living in areas with one or more supermarkets were more likely to meet dietary recommendations for fruits and vegetables than adults living in areas with no supermarkets.[27] The study also included the findings below:

- The proportion of white Americans meeting the fruit and vegetable recommendation was 11 percent higher among those living near one or more supermarkets.
- This relationship was even stronger among black Americans: Each additional neighborhood supermarket was related to a 32 percent greater likelihood of eating five or more daily fruit and vegetable servings.
- Black Americans living in areas with one or more supermarkets were more likely to meet national recommendations for limiting intake of fat and saturated fat.
- White Americans living in areas with one or more supermarkets were 10 percent more likely than those living in areas without supermarket access to meet recommendations for limiting saturated fat intake.

Several other studies have focused on supermarket access and use among low-income adults.[28–30, 40] Two of these studies found that better access to a supermarket supports healthy dietary intake.

- Low- to middle-income women recruited from prenatal clinics were found to have better overall diets, as defined by intakes of grains, vegetables, fruits, folate, iron, calcium and fat, if they lived within four miles of a supermarket.[28]
- In a low-income community in Detroit women who shopped at supermarkets consumed 1.22 more servings of fruit and vegetables daily than did women who shopped at non-chain grocery stores.[40] The disparity in consumption persisted regardless of store location; participant age, income or education; or ratings of a store's food selection, quality and affordability.[40]

Only two studies have examined associations between children's diets and access to different types of food stores.[38, 39] The findings of both studies suggest that youth with greater access to convenience stores consume fewer fruits and vegetables.

Of four studies that examined relationships between the availability of healthy food in neighborhood stores and residents' diets,[20, 26, 41, 42] three reported that greater availability of healthy food in stores was related to higher intake or availability of healthy food at home.[20, 26, 42] For example, a random sample of 102 households in New Orleans, each within 100 meters or one city block of local stores, found that each additional linear meter of store shelf space devoted to vegetables linked to an additional daily intake of 0.35 servings of vegetables.[20]

Obesity

Several studies among adults[32, 33, 35, 36, 43] and children[31, 34, 44] have examined relationships between access to food stores and obesity. Despite some inconsistencies, findings suggest that greater access to supermarkets may be related to a reduced risk for obesity,[31, 33–36] while greater access to convenience stores may be related to an increased risk for obesity.[31, 33] The relationships were found above and beyond factors including gender, race, income, education, physical activity and the availability of other types of food stores.

A study of more than 10,000 men and women in four states examined access to three types of retail food stores: supermarkets (corporate-owned), grocery stores (non-corporate-owned) and convenience stores.[33] Although one-quarter of study subjects lived in a neighborhood with at least one supermarket, most lived in neighborhoods with a convenience store and approximately half lived near at least one grocery store. The study also included the findings below:

- Neighborhoods with access to supermarkets alone or supermarkets and grocery stores had the lowest rates of obesity (21 percent).
- Residents in neighborhoods with access to supermarkets and convenience stores had 35 percent higher rates of obesity than those in areas with access to supermarkets alone.

- The highest obesity rates (32 to 40 percent) occurred in neighborhoods with no supermarkets that had access only to grocery stores or to grocery stores and convenience stores.

Two of three studies in children and adolescents have found a similar relationship between supermarket access and obesity as was found among adults.[31, 34] One study mapped home addresses of 7,334 youth ages 3 to 18 years who visited a clinic for well-child care. Using the mapped addresses, researchers examined relationships of neighborhood characteristics with weight status measurements that were completed at the clinic.[34] Results among those living in neighborhoods with low population density showed that living a greater distance from a large supermarket increased the risk for obesity. This relationship did not change when researchers considered child age, race and gender or neighborhood income level.

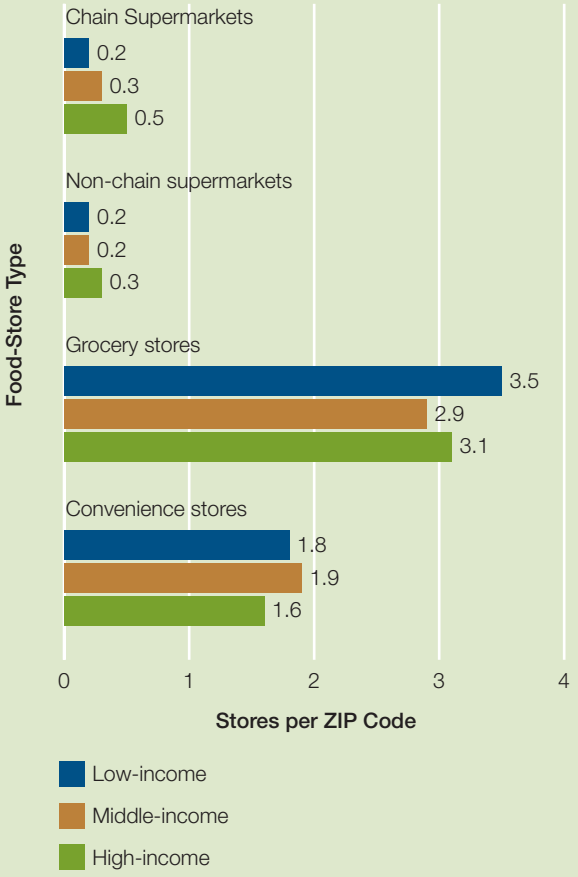
What does research reveal about inequalities in access to supermarkets and to healthy foods?

If, as evidence suggests, greater access to supermarkets and large chain grocery stores contributes to healthier diets and reduced obesity risk, the next concern is whether there are disparities in access. Despite some inconsistencies, numerous U.S. studies have shown that those most affected by poor access to supermarkets and grocery stores are residents of rural areas[42, 45–48] and of low-income[24, 25, 42, 45, 49–57] and minority neighborhoods.[23, 27, 42, 45, 49–51, 53, 54, 57–61]

A recent national study examined neighborhoods across 28,050 U.S. ZIP codes for disparities in access to food stores.[45] The study considered a number of factors that might explain disparities in access, including population size, urbanization and U.S. region. After accounting for these factors, the study still found there are fewer chain supermarkets in rural areas than in urban ones and in low-income and minority neighborhoods than in middle-income and non-Hispanic white neighborhoods.

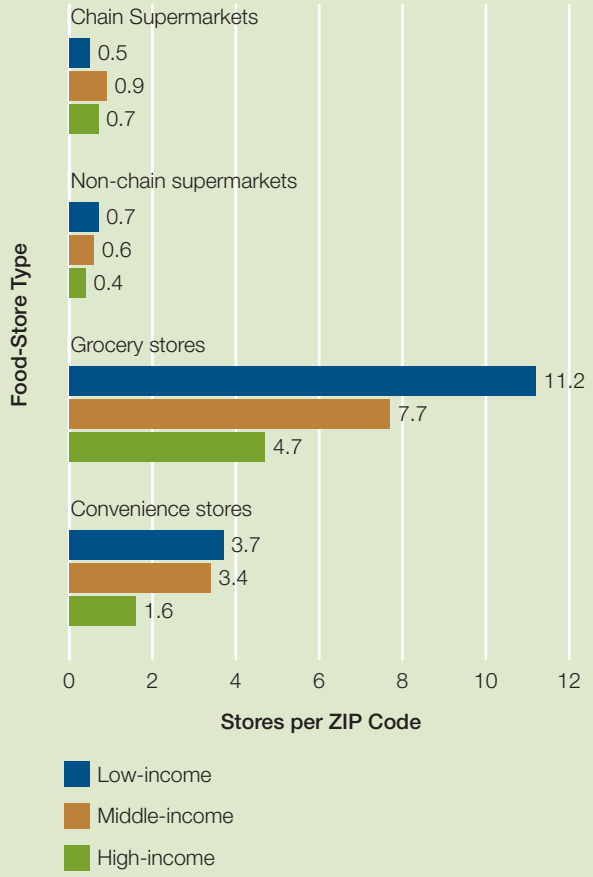
- Rural areas had 14 percent fewer supermarkets than did urban areas. Food-store access across all categories—chain and non-chain supermarkets, grocery stores and convenience stores—was greatest in suburban areas. Suburban areas had between 1.5 and 2 times the number of food stores compared with urban areas.
- Low-income neighborhoods had 25 percent fewer chain supermarkets than did middle-income neighborhoods (see Figure 1a). In urban areas, low-income neighborhoods had 1.3 times as many convenience stores as did middle-income neighborhoods (see Figure 1b).
- There were roughly half as many chain supermarkets in primarily black neighborhoods as in primarily white neighborhoods. Primarily Asian neighborhoods had only 27 percent as many chain supermarkets as did primarily white neighborhoods. Neighborhoods with higher proportions of Hispanic residents had only 32 percent as many chain supermarkets as primarily non-Hispanic neighborhoods. Within urban areas, the disparity in food store access between black and white neighborhoods was even greater, but no disparities were found by neighborhood ethnicity (Hispanic versus non-Hispanic).

Figure 1a. **U.S. Food-store Availability by Income, Mean Number per ZIP Code**



Powell L, Slater S, Mirtcheva D, et al. "Food store availability and neighborhood characteristics in the United States." *American Journal of Preventive Medicine*, 44(3): 189–195, March 2007.

Figure 1b. **Urban U.S. Food-store Availability by Income, Mean Number per ZIP Code**



Powell L, Slater S, Mirtcheva D, et al. "Food store availability and neighborhood characteristics in the United States." *American Journal of Preventive Medicine*, 44(3): 189–195, March 2007.

Some research suggests that racial and ethnic disparities are greatest in low-income neighborhoods. One study conducted in metropolitan Detroit found that the distance to the nearest supermarket was similar among the highest-income neighborhoods, regardless of racial composition.[53] However, in the lowest-income areas, the distance to the nearest supermarket was an average of 1.1 miles greater for predominantly black neighborhoods compared to predominantly white neighborhoods.

At least five other research studies have also found that more supermarkets are located in predominantly white neighborhoods than in racially-mixed or predominantly non-white neighborhoods.[51, 54, 57, 58, 60] Further, several studies have shown that the availability and quality of fresh produce, low-fat dairy products, low-fat snacks, lean meats and high-fiber breads are better in predominantly white neighborhoods than in predominantly non-white neighborhoods.[25, 42, 50, 58–60]

For example, research in two racially and economically diverse areas (over 45 census tracts) in Brooklyn, N.Y., examined the accessibility of supermarkets, small grocery stores, delicatessens and fruit-and-vegetable markets and the availability of produce across food store types in 166 randomly sampled stores.[58] The research showed the following results:

- In predominantly white areas there was one supermarket for every three census tracts, compared with approximately one supermarket for every four census tracts in racially-mixed areas. There were no supermarkets in predominantly black areas.
- The majority (64 percent) of inventoried fresh produce varieties were more widely available in predominantly white neighborhoods than in racially mixed or predominantly black neighborhoods.
- Although canned and frozen produce was available in the majority of stores, prepared fresh produce (e.g., pre-washed greens, cauliflower florets, sliced pineapple) was mostly limited to stores in predominantly white areas.

What strategies can improve overall access to healthy food?

A number of strategies have been proposed for improving access to healthy food and reducing inequalities (see Table 2).[62–64] Case reports and a limited number of evaluation studies document the success of various strategies within communities.[63, 65, 66] To build support for broad implementation of these strategies, additional research needs to be carried out to identify which are most effective in different communities.[65]

Increasing the number of supermarkets and developing alternate retail outlets for fruits and vegetables is one potential strategy. Yet few initiatives to attract supermarkets to underserved neighborhoods have been reported. One recent study surveyed city planners in 32 communities and identified several ways to attract supermarkets to underserved areas. However, only three cities reported successfully implementing systematic efforts to establish new supermarkets.[63]

Improving the availability and accessibility of farmers' markets is another proposed strategy. At least two studies have demonstrated that the Farmers' Market Nutrition Programs for elders and low-income women in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) may lead to improvements in intake of fruits and vegetables.[67, 68] Although further research is needed to evaluate the benefits of farmers' markets for other populations, these initial studies suggest increasing farmers' market access could lead to healthier diets.

Table 2. **Potential Strategies for Improving Access to Healthy Food**

Strategies for city planners, nonprofit groups and private businesses to attract supermarkets to underserved neighborhoods:	Strategies for improving the availability of fruits, vegetables and other healthy foods:
■ help conduct a needs assessment or market feasibility studies; ■ identify potential store sites; ■ assist with site assembly and environmental cleanup; ■ offer financial incentives such as fee waivers and tax abatements; ■ assist with issues such as parking and public safety; ■ provide shuttle service to stores or develop other transportation options; ■ facilitate or simplify the development approval process; ■ recruit and prepare residents for store jobs; and ■ mediate community-store conflicts.	■ establish more farmers' markets and public markets; ■ increase participation in community-supported agriculture programs; ■ establish cooperative grocery stores; ■ connect growers with neighborhood convenience stores, community centers, health care clinics and religious organizations; ■ develop community gardens; ■ link emergency food providers to local growers; ■ establish mobile stores to deliver healthful products to a drop spot or doorsteps; ■ improve signage and shelf labels that identify healthful food choices; and ■ sell healthy foods at reduced prices.

Adapted from Levy J, Institute for Agriculture and Trade Policy 2007; Pothukuchi 2005; Glanz and Yaroch 2004.

What research is needed to direct policy changes and future interventions?

Further research can clarify the connections among access to retail food stores, dietary intake and risk for obesity. However, the available evidence indicates that research to inform environmental and policy changes needs to be a priority in order to reverse the trend of increasing obesity rates and create healthier communities.

To guide future research on correcting inequalities in access to healthy food, leading experts in the fields of nutrition and public health have developed a number of specific objectives:[69–72]

- **Develop valid, reliable measures of nutrition environments and policies.**

  Although a number of studies have reported on neighborhood access to food stores, these studies have not applied a standard set of definitions or measures, and there is no consensus regarding best practice. Some research suggests that it may in fact be necessary to use a combination of measures and data sources (e.g., business lists, county food licenses, field work) when enumerating food stores.[22]

- **Carry out long-term and multilevel studies to learn more about the potential for environmental changes to improve diet and reduce obesity.**

  A number of factors contribute to diet and the development of obesity. To better understand the relative importance of environmental, demographic, psychological and social factors and their interaction, studies should examine potential pathways of influence and the contributions of each factor. Few studies have involved long-term designs or reported on children or adolescents.

- **Conduct studies that better define and characterize the multiple environments where people live, work and learn.**

  No consensus exists regarding how to best define environments with the potential to influence diet and obesity. Work and school environments as well as residential neighborhoods may play a role. For example, a person may shop at a supermarket closer to their work than their home. In research, the definition of neighborhood environment should be made specific to the population's nutrition concerns and available transportation options. Relevant definitions may vary by socioeconomic status, age group, health status or other characteristics.

- **Implement and evaluate interventions designed to help underserved areas attract food stores and increase access to a healthy, affordable food supply.**

  Research should evaluate the effectiveness of strategies to improve access to food, and the impact those strategies have on diet. Factors other than the physical distance from sources of healthy food may have an important influence on diet. For example, interventions

designed to improve access to healthy foods also may need to consider economic and social factors that contribute to choices about where to buy food. The design, evaluation and long-term implementation of successful strategies will likely require the cooperation of stakeholders with expertise in diverse fields, including urban planning, public policy, intercultural relations, nutrition and public health.

In summary, a number of national and local studies across the United States have identified inequalities in access to food stores according to income, race, ethnicity and urbanization. Americans shop at many different types of food stores, but tend to prefer large stores (e.g., supermarkets, supercenters) which offer the greatest variety of healthy food at low prices. Studies examining inequalities in access to food stores tend to show that residents of rural areas, or low-income and minority neighborhoods, are most affected by poor access to large food stores. These inequalities in access to large food stores and affordably priced healthy foods have a potentially great impact on health disparities. Other research studies have found evidence indicating that neighborhood residents who have better access to supermarkets and limited access to convenience stores tend to have healthier diets (e.g., better intake of fruit, vegetables and key nutrients) and lower rates of obesity. Reducing inequalities in access to healthy foods will require additional research to identify the most effective strategies and policies. The advancement of research in this area will require the further development of reliable and accurate food store databases, geocoding tools and measures for in-store observations; longitudinal and multilevel study designs; relevant definitions of neighborhood boundaries; and means for considering the multiple environments in which people live, work and learn.

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About Healthy Eating Research

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