



FOOD ENVIRONMENTS

BACKGROUND READING

Essential questions

- To what degree are individuals responsible for their food choices?
- How do food environments influence food choice and health?
- Are food choices—or a lack of food choices—a social justice concern? If so, how?
- How can we know whether a food environment is healthy?
- How can unhealthy food environments be improved?

Introduction

This module explores the effects of **food environments**—settings like schools, restaurants and stores—on what people eat, and their health. While the relationships between food environments and diet are not yet fully understood,¹ studies have shown that residents of communities without access to affordable, healthy food options generally have poorer diets and are at a higher risk for certain diet-related diseases.²⁻⁷ Some people view the burden of unhealthy food environments as a social justice concern, particularly since low-income communities and communities of color are often those that are most affected.⁸⁻¹⁰ These concerns are relevant to both urban and rural settings.

In this tour of food environments and their effects, we begin with homes—where Americans consume the majority of their daily **calories**—before moving on to schools, restaurants, supermarkets, convenience stores, farmers’ markets, food banks and other parts of the food environment. Along the way, we consider some of the historical contexts that led to the current state of food environments. We then examine communities as a whole, including aspects such as public transportation (or a lack thereof) that can enable residents to access a broader palate of food choices. Finally, because “what is not measured is not managed,” we introduce tools for assessing food environments and discuss their roles in improving diets.

Homes

Americans, on average, consume an estimated 68 percent of their total calories from foods prepared at home.¹¹ For many people, particularly youth, their food choices are strongly affected by the foods that are readily available in their home environment.^{12,13} For example, the presence of fruits and vegetables in homes has been associated with greater fruit and vegetable consumption among children.¹³⁻¹⁵ Fruit and vegetable consumption is also higher in homes where produce is made easily accessible, such as by peeling and slicing carrots and storing them in the refrigerator.¹⁴ Similarly, the presence of soft drinks in homes has been strongly associated with soft drink

consumption among children.¹⁶ The influence of family on food choice is further discussed in *Diet and Influences on Food Choice*.

Schools

Schools play a key role in affecting the diets and health of children and adolescents. Outside of their homes, most children spend the majority of their time in schools,¹⁷ where students who eat school meals for breakfast and lunch may consume over half of their daily calories.¹⁸

Over a third (36 percent) of U.S. youth are **overweight** or **obese**¹⁹—more than at any other time in history.²⁰ Recent research indicates that the main sources of energy for 2- to 18-year olds included cakes, cookies, donuts, pies, soda, and other **nutrient-poor** foods.²¹ School meals can both address—and contribute to—these dietary health concerns.

Most public and private schools offer meals through the **National School Lunch Program**, the School Breakfast Program, or both.²² These meals are expected to meet dietary guidelines set by the **U.S. Department of Agriculture**, though over two thirds of public schools serve meals that exceed recommendations for total and saturated fat.¹⁷

What is the effect of federal meal programs on children’s diets? Surveys suggest that students who eat meals offered through the National School Lunch Program consume higher amounts of fat and sodium, but also lower amounts of **added sugars** and higher amounts of several key **dietary nutrients** (including calcium and B vitamins), than students who do not.¹⁸ They also drank three times as much milk and half as much soda, which may explain the differences in fat and sugar intake.¹⁸ The free and reduced-price meals offered through federal programs also serve as an important safeguard against hunger, particularly for the 59 percent of children eating school meals who come from low-income families (refer to *Hunger and Food Security*).²³

Historically, the nutritional value of federal school meals programs has been the subject of controversy. In 1981, a government official proposed that ketchup and relish—sweetened condiments—be considered vegetables in meeting nutritional requirements.^{24,25} This proposed change would have reduced government spending on school meals (ketchup is a cheaper alternative to fresh vegetables), but it was met with fierce criticism and never implemented.^{24,25} This incident illustrates the ongoing tension between limited funding for school meal programs and the desire to maintain or improve healthy options.

The ketchup controversy was not the first time the nutritional value of school food would be compromised for budgetary reasons. When the National School Lunch Program was first introduced in 1946, restrictions were put in place to keep private food manufacturers out of schools. Founders of the program were concerned that “Corporations [would] sell anything to the child as long as he has the money to pay for it.” But by the 1970s and 80s, school meal programs became increasingly desperate for funding, and private companies could provide meals cheaply and

efficiently.²⁵ Restrictions were eventually lifted, paving the way for fast-food chains, soft-drink manufacturers and other corporate vendors to sell their products in schools.

Foods sold outside of federal meal programs are called **competitive foods**. As of 2005, nine out of ten public schools in the United States allowed competitive foods to be sold, typically through vending machines, snack bars and cafeterias.²⁶ While they provide a substantial source of revenue for schools,²³ competitive foods raise some **public health** concerns: Unlike federal meals, they are rarely required to meet nutritional requirements¹², and are often high in calories, fat and sugar.^{19,26,27} The most common competitive foods are sweetened beverages, salty snacks and high-fat baked goods.²³ Industry representatives have admitted that selling these products in schools is only marginally profitable, but they benefit from the opportunity to recruit lifelong **brand loyal** customers at a young age.²⁵ Refer to *Food Marketing and Labeling* for more on marketing to youth.

Many parents, teachers, public health advocates and other groups are fighting for healthier options in schools. They are calling for stricter regulations on competitive foods, more fruits and vegetables in school meals, improved nutrition education, and farm-to-school programs that introduce fresh, local produce into cafeterias.¹² For example, as part of the *Slow Lunch Initiative* in California, schools added more fresh fruits and vegetables to their lunch offerings, and offer hands-on cooking and gardening classes for students. These changes have increased students' knowledge of nutrition, and increased their consumption of fruits and vegetables.²⁸ Efforts to improve school meals, however, face many challenges—including tight budgets, limited kitchen staff and facilities, and the fact that students may object (at least initially) to healthier meal offerings when they have the option of familiar alternatives like pizza and fries.²⁴

Restaurants

Americans eat 32 percent of their total calories from restaurants, including fast-food and takeout establishments.¹¹ In 2006, American households spent nearly half of their food budgets on meals and snacks prepared away from home (at restaurants, hotels, schools and other places), up from 30 percent in 1965.²⁹

Why is this cause for concern? Individuals who frequently eat at restaurants tend to consume more calories and fat and less fruit, fewer vegetables and less **fiber** compared to individuals who eat more meals prepared at home.³⁰ Contrary to what some consumers may expect, full-service restaurants do not necessarily offer more healthful options than fast-food restaurants.^{30,31} Restaurants also tend to offer large portion sizes,¹² which has been shown to encourage consumers to eat more.³² In some cases, portion sizes of sodas, french fries, hamburgers, and chocolate bars are between two and five times larger than when these foods were originally introduced.³³ Research suggests that without nutrition information on menus, consumers are likely to underestimate the amounts of calories, saturated fat and sodium in restaurant items (refer to *Food Marketing and*

Labeling).³⁴ Eating out more frequently has been associated with weight gain and obesity,¹² possibly due to the influences on food choice that have been described here.

Food stores

Retail food stores include supermarkets, small-scale grocers, and convenience stores. Two of the most important considerations in how these places affect consumers' health are the cost and availability of healthy food options (such as fruits, vegetables and low-fat or low-sugar options), compared to less healthy alternatives.⁸

Supermarkets are generally thought to offer the greatest variety of healthy options at the lowest costs.^{12,35} **Economies of scale**—the increase in efficiency gained from operating at a larger scale (buying in bulk, for example)—allow supermarkets to save on costs.³⁵ Those savings may be passed on to consumers in the form of cheaper products.³⁵ The larger cold storage capacity of supermarkets also allows them to stock more perishable goods, such as meats and fresh produce. Possibly for these reasons, studies have found that residents of neighborhoods with supermarkets tend to eat healthier diets (more fruits and vegetables, for example), and have lower rates of obesity and hypertension.^{6,8,12,36}

In contrast, neighborhoods with a higher concentration of smaller stores such as small-scale grocers, corner stores and convenience stores have been associated with higher rates of overweight and obesity.^{6,36} While some small-scale grocers sell healthy food at reasonable prices, studies suggest that small-scale grocers, corner stores and convenience stores generally carry fewer items, of lower quality and at higher prices, than supermarkets.^{6,35,37} In some corner stores where the owners are concerned about security, foods are displayed behind bulletproof glass and sold through a revolving window.⁴ Consumers buying from “behind-glass” stores have limited ability to inspect the quality of products or view nutrition labels or expiration dates.⁴ A study of behind-glass stores in Baltimore found them to have the most limited selection of healthy foods.⁴

The physical layout of the inside of stores can also influence customers' food choices. For example, stores typically stock perishable sections around the perimeter with the understanding that customers looking for staple items like milk and cheese will be directed to walk through the entire store, encouraging them to select products they may not have planned to purchase.³⁸ Several authors recommend shopping primarily along the periphery of stores, where fruits, vegetables and other minimally processed foods are generally found.^{39–41}

Food store alternatives

Although a recent survey suggests most U.S. consumers buy the majority of food from grocers and supermarkets,⁴² there are many alternative sources of food. Some of these alternatives have grown in popularity; the numbers of farmers' markets and **community supported agriculture** (CSA) programs in the U.S. have risen dramatically over the past 10 years.⁴³ Through these arrangements,

farmers typically sell fruits, vegetables, eggs, meat and other fresh fare directly to consumers.⁴³ Some farmers' markets now allow consumers to make purchases using **Supplemental Nutrition Assistance Program** (SNAP, formerly the Food Stamp Program) benefits, and provide coupons to low-income seniors and participants of the **Women, Infants and Children program** (WIC).⁴³ Many citizens also produce their own food in backyard and community gardens. Other alternative food sources include those that provide **emergency food** assistance, such as food pantries and soup kitchens (refer to *Hunger and Food Security*).

Communities

When we examine food environments at the community level, we might consider the following questions: How many food outlets are there in the community? What type of outlets are they (supermarkets, corner stores, farmers markets, etc.)? Where are the outlets located, and how easily can residents travel to them? All of these factors—the number, type, location and accessibility of places to acquire food—are frequently associated with the health of community members.⁸ For example, people who live in areas with limited access to healthy food tend to eat less healthy diets and suffer more from obesity and type 2 **diabetes** than those living in communities where more healthy foods are accessible.²⁻⁴

Food deserts

Food deserts are areas with limited access to affordable and nutritious food, particularly among low income communities.¹ We define food deserts using four criteria: distance from a supermarket, household income, vehicle ownership and the availability of healthy food in stores.⁴⁴ For example, in an urban setting, an area qualifies as a food desert if it is outside of walking distance from the nearest supermarket, the median household income is at or below 185 percent of the **federal poverty level**, 40 percent of households do not own a vehicle and the availability of healthy food in stores is considered low (based on the results on in-store surveys).⁴⁴ In rural settings, where walking to a supermarket is less feasible, areas over ten miles from a supermarket are sometimes considered to be food deserts. It is also important to consider whether residents have access to affordable public transport, shuttle services or other means of transportation.¹ For residents who live closer to supermarkets, features such as sidewalks, controlled intersections and safe neighborhoods can make walking a more viable option.¹

In some urban areas, food deserts are often areas that were once well-served by supermarkets or large-scale grocers, but now suffer from what have been called “grocery gaps.”⁴⁵ The disappearance of supermarkets from low-income neighborhoods is a result of several changes that took place over the past 80 years.³⁵ After World War II, middle class families migrated to newly built suburbs.³⁵ Supermarkets soon followed, relocating away from core neighborhoods to suburbs, where they could attract more affluent consumers.³⁵ Supermarkets also benefitted from cheaper land that allowed them to grow larger in size (for more on industry consolidation, refer to *History of*

Food).^{35,46} Many of the poorest urban areas in America lost supermarkets.³⁵ Although work is being done to encourage supermarkets to return to low-income areas, store owners have expressed concerns about crime and a lack of buying power among lower income residents.³⁵ Zoning laws, the scarcity of large lots and limited parking are other potential barriers for supermarkets in urban areas.³⁵

Some researchers suggest that the overabundance of unhealthy food in a community—rather than the absence of healthy food—is more of a problem with regards to obesity.^{1,47} For this reason, they have proposed the term food swamp as a “more useful” alternative to food desert.⁴⁷ Food swamps refer to places where the abundance of nutrient-poor snack foods such as cookies, chips and sodas overwhelms the presence of fruits, vegetables and other healthy options.⁴⁷

Food environments and equity

In many cases, the burden of unhealthy food environments weighs more heavily on low-income communities and communities of color. Residents of these communities are often surrounded by a higher concentration of fast food restaurants^{8,9} and fewer supermarkets⁹ than predominantly white or high-income communities. Low-income communities and communities of color have also been found to have fewer healthy options, such as high-quality fruits and vegetables.^{8,9} Adolescents may be particularly affected by disparities in food environments; research suggests that fast food restaurants and convenience stores tend to cluster around schools that serve a higher percentage of low-income students and students of color.^{9,10}

Measuring and improving food environments

One of the most important steps in improving unhealthy food environments is to measure the problem. As the popular saying goes, “What is not measured, is not managed.”

Tools such as maps, surveys, checklists and interviews can better our understanding of food environments. Some researchers use geographic information to measure the type and distribution of food sources in a community; this might involve counting the number of grocers in a neighborhood, or measuring the distance from a residential area to the nearest supermarket.⁴⁸ Checklists can be used to describe the cost and variety of foods stocked in stores and schools, while sales receipts indicate which products are being sold to consumers.⁴⁸ Surveys can also be used to measure residents’ perceptions of their food environments.⁴⁸ Data on the availability and accessibility of foods can then be compared against other measures, such as health outcomes or family income levels.⁴⁹

Evidence gathered from measuring food environments can guide efforts to improve them.⁵⁰ Neighborhood planners and other policymakers might encourage more fresh food availability by offering grocery stores tax incentives, by setting up new farmers’ markets, or by changing zoning laws to encourage community gardens. Administrators might limit the availability of vending

machines in schools. Public health researchers and citizens could ask local store owners to stock healthier foods, and encourage their friends and neighbors to purchase those foods. Officials might increase bus service to grocery stores; or in some food deserts, helping to open a new supermarket might be a more effective alternative to improving transportation.¹ Some cities have organized **food policy councils**, which bring together these and other stakeholders in the food system to promote changes that improve their cities' food environments.⁵¹

Conclusion

There is a growing body of knowledge linking the cost and availability of healthy food to diet-related disease. What we eat, the research suggests, may be heavily influenced by where we live, work and study. Still, there is much to be learned about the effects of food environments on diet and health.¹ Efforts to better understand these effects, and to foster healthier food environments, can be furthered by the many tools at our disposal.

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