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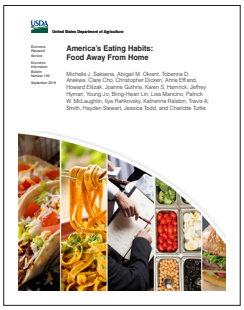

America's Eating Habits: Food Away From Home

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What Is the Issue?

Over the past several decades, Americans have grown to rely on the convenience of foods prepared outside of the home. Unfortunately, food away from home (FAFH) often contains fewer fruits and vegetables and have more calories, fat, and sodium than food prepared at home (FAH), and consuming FAFH is associated with obesity. Recently passed labeling legislation aims to help consumers make healthier FAFH choices and to encourage FAFH suppliers to produce more healthful options. To explore Americans' eating away from home behavior, this report presents research on three broad FAFH topics: (1) food choices and availability; (2) nutrition and diet quality; and (3) food policies, including menu labeling and food assistance programs.

What Did the Study Find?

Food choices and availability of FAFH. Over the past 30 years, FAFH's share of U.S. households' food budgets and total food spending grew steadily. FAFH options also became more widely available as growing numbers and types of businesses—including grocery stores—served prepared foods. Apart from the Great Recession (2007-09), these trends continued uninterrupted from 1987 to 2017, but the changes were not uniform across socioeconomic groups or business types.

- Spending on FAFH surpassed spending on FAH for the first time in 2010, increasing its share of total food spending from 44 percent (30 years prior) in 1987 to 50.2 percent in 2010.
- Higher income households spent more on FAFH and bought it more frequently than lower income households. Households with incomes greater than 300 percent of the Federal poverty guidelines obtained FAFH on 5.5 occasions per week, while households whose incomes were less than or equal to Federal poverty guidelines obtained FAFH on 4.2 occasions per week.
- For households with an elderly individual (over 64 years old), the share of household food spending on FAFH was 8 percent lower than for other households. Also, Americans who were 35–44 years old consumed FAFH more often than other Americans.

- In 2000–15, quick-service restaurants (QSRs), also referred to as fast-food and limited-service restaurants, drove the industry's growth both in sales and number of outlets. The fastest-growing segment of the QSRs was fast casuals—e.g., Chipotle Mexican Grill and Panera Bread—which combines counter service with the perceived ambiance and product quality of full-service restaurants (FSRs).
- Much of the growth in foodservice establishments occurred in urban U.S. counties, consistent with patterns of urban and rural migration. As rural populations declined, FSRs in rural areas were particularly hard hit, leaving QSRs to dominate.
- Spending on FAFH declined during the Great Recession, by $47 billion (18 percent) in real dollars from 2006 to 2010, and rebounded thereafter.
- During the Great Recession, households replaced spending at FSRs with unprepared foods purchased at retail stores (like grocery stores), but households' share of spending for QSRs stayed constant. In 2014, household expenditures on FAFH had yet to rebound to pre-Recession levels.
- Despite the downturn in household spending on FAFH during the Great Recession, the number of chain QSRs grew, and consumers spent a greater share of their FAFH dollars at these restaurants.

Nutritional composition and diet quality. The nutritional composition of FAFH across all income levels and all FAFH types (except school foods) was consistently lower quality and more caloric than that of FAH. Though FAFH is known to have lower diet quality, access to FAFH did not seem to affect FAFH consumption and did not correlate with diminished overall diet quality.

- FAFH's share of total average daily energy intake increased from 17 percent in 1977–78 to 34 percent in 2011–12, and consumption of QSR foods was the largest source of this growth.
- On the whole, FAFH contained more saturated fats and sodium, and less calcium, iron, and fiber than FAH—however, the nutritional composition of FAFH varied across outlet types. For example, in 2009–12, the fat content of school lunches (a type of FAFH) was almost identical to that of FAH (33 percent) while the fat content of QSR foods averaged 39 percent.
- Although frequent QSR customers purchased less vegetables, fish, and nuts, their overall diet quality was no worse than that of QSR nonconsumers.

Policies that affect FAFH. FAFH consumption is influenced by public policy mainly on two fronts. First, current food assistance programs with in-kind food benefits affect food choices and diet quality of participating low-income households. For example, new requirements that improve nutrition of school meals directly affect children's diet quality. Second, new menu labeling regulations may help consumers make more informed food choices at restaurants.

- The average household Healthy Eating Index (HEI-2010) for FAFH was lower than for FAH, regardless of SNAP participation or income.
- School meals provided by the National School Lunch Program and School Breakfast Program contained higher levels of calcium than both FAH and other sources of FAFH and adhered better to USDA's *Dietary Guidelines for Americans* than other sources of FAFH.

How Was the Study Conducted?

This report uses a variety of data sources and techniques to examine FAFH trends. The analysis was done primarily using descriptive statistics (e.g., means, differences, and correlations) and literature review. The main data sources were the National Health and Nutrition Examination Survey (NHANES), USDA ERS's Food Expenditure Series, the National Household Food Acquisition and Purchase Survey (FoodAPS), the Consumer Expenditure Survey, U.S. Census Bureau's Monthly Retail Trade and Foodservices series, NPD ReCount, and Euromonitor Passport. These data sources include self-reported information and measurable individual characteristics collected by household survey, establishment information, and proprietary industry data.

Chapter 8: How Food Environment and Proximity to Restaurants Affect Nutritional Quality

Ilya Rahkovsky, Young Jo, and Lisa Mancino

Using data from USDA's National Household Food Acquisition and Purchase Survey (FoodAPS), this chapter examines the food environments, diet quality, and demographic characteristics of the survey respondents who dine out frequently versus those who do not do so. This analysis finds a weak association between fast-food purchases and diet quality and that consumers at full-service restaurants tend to have a better diet. This finding is partly explained by the fact that those who frequent full-service restaurants are of higher socioeconomic status and tend to purchase a more nutritious diet.

In chapter 7, food away from home (FAFH) is found to have inferior nutritional quality to home-prepared meals, with the notable exception of school meals. For several reasons, restaurant and supermarket location may nudge consumers to consume more FAFH. This analysis builds on chapter 7 by examining the premise that closer proximity to restaurants is associated with greater frequency of restaurant meals, consequentially deteriorating overall diet quality and health. Additionally, chapter 5 finds associations between frequency of FAFH acquisitions and demographic characteristics using the FoodAPS. In this chapter, FoodAPS is again used to investigate (1) if local food environments are associated with the frequency of FAFH purchases, particularly fast-food and full-service restaurant meals; and (2) if the frequency of FAFH purchases is associated with diet quality.

Food Environments, Diet Quality, and Health

The location of restaurants and stores can influence how often people consume restaurant meals, which in turn can affect their diet quality and health outcomes, such as obesity. Existing studies examine the relationship between local food environments and residents' diet quality and health outcomes. However, the observed relationship does not necessarily imply causality because individuals with poor diet quality and health may be more likely to live in areas with adverse food environments. Moreover, fast-food restaurants and grocery stores are likely to be located in areas with high demand. A growing number of studies apply a range of econometric methods to identify causality (Alviola et al., 2014; Currie et al., 2010; Dunn, 2010; Dunn et al., 2012; Lhila, 2011). However, these studies are limited to how the food environments affect body weight rather than diet quality, potentially because of the lack of appropriate datasets.

Food prepared away from home generally contains more calories, is served in larger portion sizes, and is less nutritious (e.g., high in fat and sodium) than food prepared at home (Guthrie et al., 2002; Mancino et al., 2010; Nielsen and Popkin, 2003; chapter 7). Fast food (FF), in particular, is associated with high energy intake, low intake of essential micronutrients, and inferior metabolic outcomes (Duffey et al., 2009; French et al., 2000 and 2001; Fulkerson et al., 2011; Gillis and Bar-Or, 2003; Larson et al., 2011). Using the Continuing Survey of Food Intakes by Individuals (CSFII 1994-96), Bowman and Vinyard (2004) note that adults who consumed fast food (FF) during the survey period had substantially higher intakes of energy, total fat, saturated fat, carbohydrates, added sugars, and protein than non-FF consumers. The FF consumers also had lower intakes of vitamin A, carotenes, vitamin C, calcium, and magnesium.

There are two strands of literature looking at the effects of local food environments (including restaurants), on the diet quality and health outcomes of residents. One body of literature focuses on the relationship between lack of grocery stores offering healthy food options, commonly known as food deserts, and poor diet quality and health outcomes. Another body of literature focuses on the relationship between an abundance of restaurants selling unhealthy foods—such as fast-food restaurants—and poor diet quality. The underlying assumption in these studies is that proximity to stores or restaurants lowers the cost of consumption, resulting in frequent consumption of particular types of food, which subsequently affects diet quality. For example, the cost of consuming a restaurant meal consists of accessibility (travel time) and affordability (price). Therefore, given some fixed price, an individual is more likely to consume a restaurant meal if travel time declines.

The findings on food environments and diet quality are mixed. Some researchers find that easy access to stores selling healthy foods is associated with better diet quality and improved health (Carroll-Scott et al., 2013; Harrison et al., 2011; Laraia et al., 2004; Rose and Richards, 2004; Zick et al., 2009); others find that physical proximity to a grocery store is not strongly associated with diet quality since most people do not buy all of their food from the nearest grocery store (Aggarwal et al., 2014; Ver Ploeg et al., 2015). The overall availability of healthy foods, rather than physical distance, seems to be what matters in influencing people's diet quality (Bodor et al., 2008; Cheadle et al., 1991; Poti et al., 2014).

One of the main shortcomings of the aforementioned studies is that the observed relationship does not necessarily imply causation. People with poor diet quality and health may prefer to live in areas with easy access to stores and restaurants selling unhealthy foods. In addition, business owners are likely to open stores and restaurants in areas where they expect a strong demand. For instance, chapter 6 finds that most FAFH growth has been in urban areas. In these cases, the local food environments would be associated with diet quality and health, but the relationship cannot be deemed causal. Therefore, to identify the causal effect of access on diet quality, one must partition overall change in diet quality into supply and demand factors.

Recent studies attempt to identify the *causal* effect of food environments on health outcomes. Dunn (2010) finds that an increased availability of restaurants raises the Body Mass Index (BMI) of females and non-Whites in counties with medium population density (90 to 400 people per square mile and fewer than 25 interstate exits).[60] On the contrary, Anderson and Matsa (2011) find no causal effect of restaurants—both fast-food and full-service—on obesity. In their study, the prevalence of obesity in communities immediately adjacent to the interstate highways (0 to 5 miles) is similar to that in communities slightly farther from highways (5 to 10 miles) despite the lower accessibility cost of the former. The authors argue that although proximity to a restaurant induces frequent consumption of restaurant meals, people also offset extra calories from restaurants by eating less

[60]Dunn (2010) uses the number of interstate highway exits in a county to proxy for the supply of fast-food restaurants. The underlying assumption is that interstate highway exits attract fast-food restaurants without a strong demand from residents nearby, thereby effectively separating supply from the demand effect. Implicit in the assumption is that people with a strong preference for fast food do not choose to reside near highway exits.

during other meals. Anderson and Matsa also provide evidence suggesting that obese individuals consume more nutritionally deficient foods regardless of where they consume them.[61]

The analysis in this chapter examines the assumptions implicit in many studies of how local food environments affect diet quality or health. It investigates if the local food environments are indeed associated with the frequency of dining at fast-food and full-service restaurants. Furthermore, the analysis examines if the frequencies of restaurant meal purchases are associated with diet quality.

Data

The main source of data for this analysis is USDA's 2012 National Household Food Acquisition and Purchase Survey (FoodAPS) (see data box in chapter 5). FoodAPS allows the linking of an individual's diet quality with the food environment and thus provides a unique opportunity to test the assumptions underlying the current research. Studies on restaurant locations often rely on datasets with limited information on a respondent's diet. Most publicly available datasets contain information on self-reported frequency of restaurant meal consumption but not on the nutritional quality or types of meals consumed. FoodAPS uniquely provides information on the types and amount of food households acquired, as well as the source of acquisition (i.e., supermarket, fast-food restaurant, etc.) and the source's proximity to the respondent's home.

While FoodAPS provides detailed food acquisition and geographic information not commonly available in other datasets, there are several limitations. First, the survey collects information on the amount of food purchased or acquired instead of consumed. Because of spoilage and waste, we expect the amount consumed to be less than the amount purchased. Nevertheless, we assume that individuals consume all of the food they purchase in this analysis.[62] Second, because of the short sample collection period (participants report 7 days of food acquisition information), the food acquisition data may not be representative of what households typically purchase throughout a year. For instance, some households may have eaten FAFH more or less often or bought larger or smaller quantities of supermarket food during the particular week that the FoodAPS sample was collected.[63,64] Finally, the food acquisition data likely suffer from measurement error since they are self-reported. Despite these limitations, FoodAPS is the best available dataset for the present analysis.

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[61]The inconsistent findings between Dunn (2010) and Anderson and Matsa (2011) can be due to a number of reasons. First, the estimation sample for Anderson and Matsa consists primarily of White rural residents. Consistent with Anderson and Matsa, Dunn (2010) and Dunn et al. (2012) find that fast-food availability has no effect on White residents in rural areas. Second, the proxy used in the model and the measure of fast-food availability differs slightly. Dunn (2010) uses the number of highway exits as a proxy for the number of fast-food restaurants, whereas Anderson and Matsa use the distance to highway as a proxy for the distance to all types of restaurants. Finally, the geographic level of the sample differs. Although both studies use the Behavioral Risk Factor Surveillance System as their main source of obesity data, Dunn's analysis is at the county level whereas Anderson and Matsa's (2011) is at the ZIP Code level.

[62]A particular group of people (e.g., low-income households) may consume a larger share of purchased food than other groups. The analysis in this chapter assumes that the proportion of consumed to purchased amount does not vary across different groups.

[63]Some households may have purchased nothing, while others may have purchased food planned for several weeks during the survey week. The analysis excludes 3 percent of households that purchased food products with caloric content in excess of 500 percent of the recommended weekly caloric consumption for a household.

[64]About 30 percent of the products purchased at food stores lacked information on product weight. For this missing information, product weight is imputed based on the package prices, food groups, and types of stores the product was purchased at.

FoodAPS records restaurant purchases for the household, and does not provide information on how food was distributed among household members. In order to compare households of different sizes, the food purchases are normalized by the expected food consumption amount, based on the number of standard adult-equivalent (SAE) individuals with 2,000 kcal recommended intake. First, each individual in the household is assigned a weight according to the recommended caloric intake for sedentary individuals by gender and age from the *Dietary Guidelines for Americans* (USDA and HHS, 2010). For instance, if a household consists of a 35-year old man (2,400 kcal), a 35-year old woman (1,800 kcal), and 5- and 10-year old girls (1,200 and 1,400 kcal), then the recommended daily caloric intake for the household (at 3.4 SAEs) is 6,800 calories.

The primary measure of diet quality is the 2010 Healthy Eating Index (HEI)(Guenther et al., 2013) (see box "2010 Healthy Eating Index"). Because FoodAPS reports food acquisition at the household level only, HEI in this analysis represents the healthfulness of food that a household acquired during the survey week. The component scores for each of the food groups that make up the HEI are also presented.

Descriptive Statistics

Households in the sample consist of five distinct, similarly sized clusters based on the frequency of meals purchased at fast-food and full-service restaurants. The size of the "frequency" clusters and their definitions are presented in table 8.1.[65] The first cluster is "restaurant nonconsumers," where households did not purchase meals from either fast-food or full-service restaurants during the survey week. Nineteen percent of the sample households belong to the first cluster. The second cluster is "occasional FF consumers," who purchased less than 1.5 fast-food meals and no full-service restaurant meals (19 percent). The third cluster, "frequent FF consumers," purchased more than 1.5 fast-food meals per week and no full-service restaurant meals (18 percent). The fourth cluster, "occasional FF and FS consumers," (22 percent),[66] purchased less than 1.5 fast-food meals and some full-service restaurant meals per week. The last cluster, "frequent FF and FS consumers," purchased more than 1.5 fast-food meals and some full-service restaurant meals per week (22 percent of households). Figure 8.1 shows FoodAPS respondents clustered by frequency of fast-food and full-service restaurant dining.

Table 8.1
Classification of households by frequency of fast-food and full-service meals per week

	Restaurant nonconsumers	Occasional FF consumers	Frequent FF consumers	Occasional FF and FS consumers	Frequent FF and FS consumers
Fast-food (FF) meals per person per week	0	0-1.5	>1.5	0-1.5	>1.5
Full-service (FS) meals per person per week	0	0	0	>0	>0
Share of the population	0.19	0.19	0.18	0.22	0.22

Notes: The statistics are calculated using population weights and stratification information available in the National Household Food Acquisition and Purchase Survey (FoodAPS).

Source: FoodAPS data and authors' calculations.

[65]Clusters are constructed to clarify both the difference between consumers and non-consumers of FF and FS foods as well as the difference between heavy and light consumers of FAFH foods. The clusters may be different from the clusters constructed using a formal cluster analysis.

[66]While some households purchased one full-service meal per person per week and no fast-food meals ("moderate full-service consumers"), they made up only 6 percent of the sampled households, and thus are lumped into this cluster.

2010 Healthy Eating Index

The Healthy Eating Index (HEI) was developed by the U.S. Department of Agriculture's Center for Nutrition Policy and Promotion (CNPP) as a means to quantitatively measure dietary compliance of the U.S. population with the *Dietary Guidelines for Americans (DGA)*. Currently, updates are made to the HEI by CNPP and the National Cancer Institute every 5 years, corresponding to 5-year updates to the DGA. The most recent iteration of HEI is the HEI-2015 with past versions including HEI-2005 and HEI-2010.

The HEI is calculated based on 12 total food groups which include 9 standards for adequacy (total vegetables, dark green vegetables and legumes, total fruits, whole fruits, dairy, whole grains, total protein, seafood and plant protein, fatty acids) and 3 standards for moderation (empty calories, refined grains, and sodium). The standards for adequacy are targets for food groups recommended for increased consumption by the Dietary Guidelines, while moderation standards are targets for food groups recommended for decreased consumption. Scores for moderation components are derived so that higher scores reflect closer adherence to the applicable standard. Total HEI is a measure of the quality of food consumed per 1,000 calories and does not reflect quantity consumed.

Total HEI scores are the aggregation of component scores for each of the 12 nutrient groups. Each component has a maximum and a minimum score. For example, the recommended consumption of fruits is 0.8 cup equivalent per 1,000 kcal. Any consumption larger than the recommended amount will result in a maximum score of five and any consumption less than the amount will result in a lower score, with a minimum score of zero. The total HEI ranges from 0 to 100. Scores closer to 100 are considered healthier. As a reference, the mean HEI for Americans over age 2 was 49.9 in 2003-04 (Guenther et al., 2014).

Components and scoring of the 2010 Healthy Eating Index

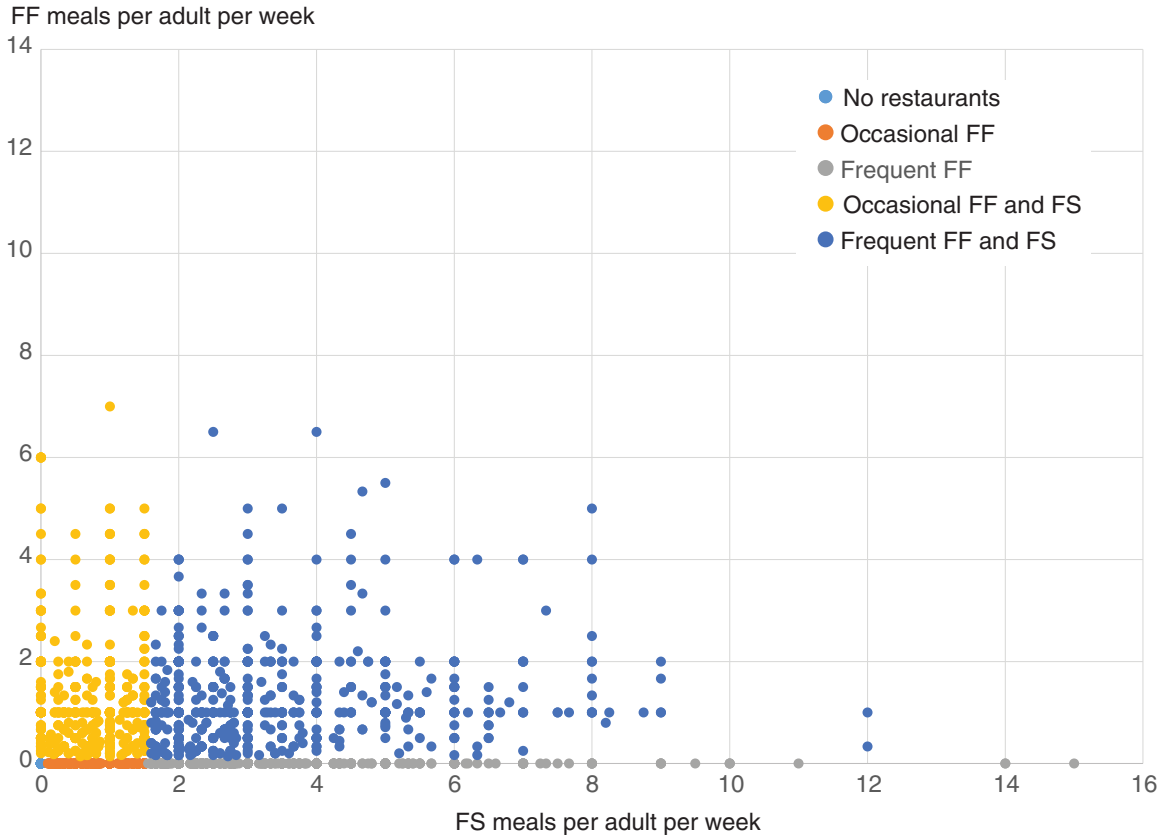
	Maximum score	Standard for maximum score[1]	Standard for minimum score of zero
Adequacy :			
Total fruits	5	≥0.8 cup	No fruits
Whole fruits	5	≥0.4 cup	No whole fruits
Total vegetables	5	≥1.1 cup	No vegetables
Greens and beans	5	≥0.2 cup	No dark green vegetables or legumes
Whole grains	10	≥1.5 oz	No whole grains
Dairy	10	≥1.3 cup	No dairy
Total protein foods	5	≥2.5 oz	No protein foods
Seafood and plant proteins	5	≥0.8 oz	No seafood or plant proteins
Fatty acids	10	(PUFAs + MUFAs)/SFAs ≥2.52	(PUFAs + MUFAs)/SFAs ≤1.2
Moderation:			
Refined grains	10	≤1.8 oz	≥4.3 oz
Sodium	10	≤1.1 gram	≥2.0 grams
Empty calories	20	≤19% of energy	≥ 50% of energy

[1]All standards, except for fatty acids, represent amounts per 1,000 kilocalories.
[2]PUFAs = polyunsaturated fatty acids. MUFAs = monounsaturated fatty acids.
SFAs = saturated fatty acids.

Source: Guenther et al (2013).

The statistics are calculated using population weights and stratification information available in FoodAPS. Bivariate t-tests are used to test if a cluster mean is statistically different from the average of other households. The statistically significant differences are denoted with bold fonts. Some caution should be used in interpreting the statistical associations presented in this chapter. The results consider only unconditional correlations between restaurant locations, restaurant consumption, and consumers' diets. The analysis of these correlations in a regression setting, or using exogenous variation in the supply and demand of restaurants, could produce different results.

Figure 8.1
FoodAPS respondents clustered by frequency of fast-food (FF) and full-service (FS) restaurant dining



Source: National Household Food Acquisition and Purchase Survey (FoodAPS) data and authors' calculations.

Demographic Characteristics

Table 8.2 presents demographic characteristics of consumers by frequency of visits to different types and combinations of restaurants.[67] Frequent FF and FS consumers have the highest socioeconomic status (monthly income), while restaurant nonconsumers have the lowest. Occasional and frequent FF and FS consumers have higher income, employment, education, and home and car ownership rates than average households. Occasional and frequent FF and FS consumers are also less likely than average consumers to participate in Supplemental Nutritional Assistance Program (SNAP) and the Special Supplemental Nutrition Program for Women, Infants and Children (WIC).

[67]For a more indepth analysis of the demographics of FAFH consumers, see chapter 5.

Table 8.2

Demographic characteristics of consumers by frequency of visits to different types and combinations of restaurants

	Restaurant non-consumers	Occasional fast-food (FF) consumers	Frequent FF consumers	Occasional FF and full-service (FS) consumers	Frequent FF and FS consumers
Female	0.55	0.54	0.51	0.52	0.53
	(0.34)	(0.29)	(0.32)	(0.29)	(0.28)
Age	54.4**	47.3**	45.0**	51.9**	46.1**
	(16.3)	(14.7)	(14.8)	(16.3)	(14.4)
Number of children	0.4**	0.9**	0.6	0.5	0.6
	(1.3)	(1.4)	(1.2)	(1.2)	(1.1)
Household size	2.0**	2.9**	2.4	2.4	2.6**
	(1.7)	(1.9)	(1.7)	(1.6)	(1.5)
Single parent	0.04	0.05	0.05	0.03	0.05
	(0.27)	(0.29)	(0.27)	(0.24)	(0.25)
Hispanic	0.12	0.19**	0.14	0.13	0.09**
	(0.37)	(0.42)	(0.39)	(0.36)	(0.35)
Black	0.16	0.17**	0.18**	0.08**	0.08**
	(0.37)	(0.37)	(0.39)	(0.29)	(0.30)
Asian	0.03	0.04	0.04	0.03	0.04
	(0.19)	(0.20)	(0.20)	(0.18)	(0.20)
Education (years)	20.0**	20.1**	20.9	21.2**	21.5**
	(2.7)	(2.5)	(2.3)	(2.4)	(2.2)
Work commute time (minutes)	22.2	22.1	18.1**	20.1	19.7
	(22.9)	(21.4)	(16.9)	(33.5)	(16.0)
Employed	0.44**	0.57	0.62	0.61	0.70**
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)
Married	0.27**	0.51	0.41**	0.51	0.54**
	(0.46)	(0.5)	(0.49)	(0.5)	(0.5)
BMI children (age 6-17)	20.3	20.9	20.9	19.8**	21.0
	(7.1)	(5.6)	(5.2)	(4.9)	(6.9)
BMI adults	27.3	27.6	27.9	27.5	28.0
	(5.8)	(5.2)	(6.1)	(5.3)	(6.1)
Monthly household Income ($)	3,406**	4,772	4,656**	6,325**	6,711**
	(4,123)	(3,793)	(3,678)	(4,979)	(4,432)
Own house	0.58	0.56**	0.56**	0.67	0.68**
	(0.50)	(0.49)	(0.50)	(0.50)	(0.49)
Household has a car	0.84**	0.89**	0.95	1.00**	0.98**
	(0.52)	(0.47)	(0.45)	(0.39)	(0.45)
Have access to car if does not own a car	0.37	0.34	0.55	0.51	0.71**
	(0.84)	(0.89)	(0.95)	(1.00)	(0.98)
Food expenditures per single-adult equivalent (SAE)	61.0**	56.3**	73.5**	97.2**	110.0**
	(46.8)	(38.7)	(52.0)	(60.5)	(63.6)
Public transport expenditures ($/month)	14.9	10.9	15.2	42.8	20.9
	(490)	(48)	(71)	(412)	(100)
Child care expenditures ($/month)	36.5	35.3	27.9	25.8	41.3
	(204.9)	(115.7)	(110.3)	(122.6)	(149.6)
SNAP participation verified	0.22**	0.21**	0.12	0.07**	0.06**
	(0.50)	(0.49)	(0.46)	(0.41)	(0.38)
SNAP participation reported	0.21**	0.19**	0.12	0.06**	0.05**
	(0.49)	(0.49)	(0.45)	(0.39)	(0.36)
Anyone in household receiving benefits from WIC	0.28	0.35	0.36	0.22	0.17**
	(0.50)	(0.50)	(0.50)	(0.49)	(0.48)
Share of population	0.19	0.19	0.18	0.22	0.22

Notes: The statistics are calculated using population weights and stratification information available in the National Household Food Acquisition and Purchase Survey (FoodAPS). ** indicates a statistically significant difference from the average (5 percent). Standard errors are in parenthesis.

Source: USDA, Economic Research Service using data from USDA's National Household Food Acquisition and Purchase Survey (FoodAPS), 2012.

Relative to the restaurant nonconsumers, frequent FF and FS consumers are younger, more educated, more likely to be employed, and have higher monthly incomes. They are also less likely to participate in Federal food assistance programs. Frequent FF and FS consumers live in areas with a shorter commute time to work, and are more likely to own a car. Occasional FF consumers are more likely to be racial minorities and have children, whereas restaurant nonconsumers are the oldest group and are the least likely to have children (table 8.2).

Since eating FAFH, especially in full-service restaurants, is generally more expensive than eating at home, consumers of full-service restaurant meals have the highest total food expenditures ($97 and $110 per single adult equivalent (SAE) a month), while restaurant nonconsumers ($61) and occasional FF consumers ($56) have the lowest expenditures. The BMIs of children and adults do not differ significantly across the FAFH clusters. Only the children from occasional FF and FS consumers have slightly lower BMI than the rest, although the difference is small.

Food Environment

Table 8.3 presents descriptive statistics of the food environment for the five types of restaurant consumers. Both frequent FF consumers and frequent FF and FS consumers tend to live in rich food environments close to all types of stores, including their primary grocery store. They also tend to live close to FS and FF restaurants. Density of restaurants around the residence is mostly statistically insignificant, except for frequent FF consumers, who tend to have more fast-food restaurants within a 1-mile radius of their home. Interestingly, occasional FF consumers have the most fast-food restaurants within a 1-mile radius of their home.

Restaurant consumers spend less time traveling and go fewer miles to their primary store (i.e., the store where consumers primarily shop for food) than restaurant nonconsumers. Restaurant nonconsumers travel 6.3 miles, or 11.1 minutes on average, to their primary store, whereas occasional FF consumers drive only 4.4 miles or 8.8 minutes. Distances to other types of food stores are also slightly farther for restaurant nonconsumers. For instance, the average distance to the nearest super store is 4.2 miles for restaurant nonconsumers and 2.5 miles for occasional FF consumers.

The distance to the nearest fast-food restaurant is strongly associated with the frequency of fast-food meals purchased. Among occasional FF consumers, the distance to the nearest fast-food restaurant is 1.7 miles; among restaurant nonconsumers, it is 3.3 miles. Moreover, the distance to the nearest McDonald's is 2.7 miles for occasional FF consumers compared to 5.4 miles for restaurant nonconsumers (table 8.3). Occasional FF and FS consumers also have a fast-food restaurant nearby (2 miles). In short, people who consume fast food frequently tend to live near fast-food restaurants. By contrast, the distance to the nearest full-service restaurant shows little correlation to the frequency of full-service restaurant meals, despite some statistically significant differences across clusters.

Table 8.3

Descriptive statistics of the food environment for the five types of restaurant consumers

	Restaurant nonconsumers	Occasional FF	Frequent FF	Occasional FF & FS	Frequent FF & FS
Distance to nearest super store (miles)	4.2**	2.5**	3.2	2.7**	2.7**
	(4.5)	(3.0)	(3.9)	(2.9)	(2.9)
Distance to nearest supermarket (miles)	3.9**	2.7**	3.7	2.6**	2.6**
	(5.1)	(3.6)	(4.8)	(3.1)	(3.1)
Distance to nearest grocery/other store (miles)	2.4**	1.5**	2.2	1.7	1.7
	(2.6)	(1.7)	(2.7)	(1.9)	(1.9)
Distance to nearest convenience store (miles)	2.0	1.5	1.8	1.7	1.7
	(2.3)	(1.8)	(2.0)	(1.7)	(1.7)
Distance to nearest larger grocery store (miles)	5.4**	4.5	4.6	4.5	4.5
	(5.7)	(5.1)	(5.1)	(4.6)	(4.6)
Distance to nearest Walmart (miles)	7.0**	4.1**	5.8	4.9	4.9
	(6.5)	(3.9)	(5.4)	(4.1)	(4.1)
# fast-food restaurants within 0.5 mile	1.5	1.8	1.5	1.5	1.5
	(3.2)	(3.4)	(3.0)	(3.1)	(3.1)
# fast-food restaurants within 1 mile	4.8	6.3**	4.6**	5.3	5.3
	(6.6)	(7.0)	(6.3)	(7.6)	(7.6)
# fast-food restaurants within 10 miles	118	154	126	137	137
	(166)	(185)	(160)	(169)	(169)
# full-service restaurants within 0.5 mile	9.4	10.3	8.1	9.4	9.4
	(23.4)	(24.6)	(20.3)	(26.2)	(26.2)
# full-service restaurants within 1 mile	26.8	30.5	24.2	30.1	30.1
	(56.9)	(60.1)	(54.3)	(69.0)	(69.0)
# full-service restaurants within 10 miles	548	665	551	617	617
	(959)	(940)	(855)	(923)	(923)
#McDonald's restaurants within 0.5 mile	0.17	0.18	0.15	0.15	0.15
	(0.50)	(0.52)	(0.41)	(0.48)	(0.48)
# McDonald's restaurants within 1 mile	0.45	0.58	0.45	0.55	0.55
	(0.81)	(0.80)	(0.75)	(0.87)	(0.87)
# McDonald's restaurants within 10 mile	11.8	14.7	12.4	13.3	13.3
	(16.8)	(17.3)	(15.8)	(16.4)	(16.4)
Distance to the nearest fast-food restaurant (miles)	3.3**	1.7**	2.4	2.0**	2.0**
	(4.4)	(2.3)	(3.6)	(2.6)	(2.6)
Distance to the nearest full-service restaurant (miles)	1.3	0.8**	1.2**	1.0	1.0
	(1.6)	(1.1)	(1.4)	(1.3)	(1.3)
Distance to the nearest McDonald's (miles)	5.4**	2.7**	3.6	3.1	3.1
	(6.3)	(3.6)	(4.8)	(3.9)	(3.9)
Rural area indicator	0.42**	0.28	0.34	0.33	0.33
	(0.47)	(0.42)	(0.46)	(0.44)	(0.44)
Driving distance to the primary store (miles)	6.3**	4.4	5.9	4.3**	4.3**
	(6.3)	(6.2)	(8.7)	(4.7)	(4.7)
Driving time to the primary store (minutes)	11.1**	8.8**	10.8	8.8**	8.8**
	(8.1)	(7.8)	(10.2)	(6.5)	(6.5)
Share of population	0.19**	0.19**	0.18**	0.22**	0.22**

Notes: The statistics are calculated using population weights and stratification information available in the National Household Food Acquisition and Purchase Survey (FoodAPS). FS = full-service restaurant meals. FF = fast-food restaurant meals. ** indicates a statistically significant difference from the average (5 percent). Standard errors are in parenthesis.

Source: USDA, Economic Research Service using data from USDA's National Household Food Acquisition and Purchase Survey (FoodAPS), 2012.

Diet Quality

Table 8.4 compares the diet quality of consumers who patronize restaurants at different frequencies. Restaurant nonconsumers and frequent FF consumers tend to have the worst diets (relatively low HEI scores), whereas occasional FF and FS consumers tend to have the best diets or diets that are closest to the recommendation. All measures in table 8.4 are weekly totals, normalized by expected caloric intake of a household. The recommended caloric intake per adult equivalent is 14,000 kcal per week (2,000 kcal x 7). However, consumer clusters report more purchased calories per week, ranging from 16,803 kcal purchased by occasional FF consumers to 19,890 kcal purchased by frequent FF and FS consumers. The Healthy Eating Index-2010, which measures dietary quality per 1,000 calories, shows that occasional FF and FS consumers have the best diet with a score of 55.5. Households that did not go to any restaurants had the worst diets, with a HEI score of 50.9. Thus, contrary to expectations, the lack of FAFH meals is not associated with healthier diet.

The relatively high HEI score of occasional FF and FS consumers compared to restaurant nonconsumers is due to frequent purchases of vegetables (16.6 cups a week), dark green vegetables (2.8 cups), and purchase of recommended fish and plant proteins (15.4 oz). The diets of occasional FF consumers also have low HEI scores, due to small amounts of vegetables (12.8 cups) and fish/plant proteins (8.8 ounces), as well as excess saturated fats (221 grams). At the same time, occasional FF consumers purchased the least amount of alcohol (23 grams) out of all groups.

Why do the restaurant nonconsumers have the lowest HEI score? These consumers purchase relatively small amounts of whole grains, and large amounts of meat, saturated fat, and sodium compared with other consumer groups. None of their food group purchases or nutrient amounts are statistically different from the average. They tend to purchase slightly fewer foods that increase HEI score and slightly more foods that reduce HEI score than occasional and frequent FF and FS consumers. Nevertheless, the magnitude of HEI differences between restaurant nonconsumers and occasional FF consumers is just 1.5 points.

Rural-Urban Divide

No significant difference is found in the tendency to purchase meals from FS restaurants between rural and urban consumers. However, urban consumers purchase slightly more FF meals (1.85 versus 1.54 meals per person per week). The diets of rural consumers are slightly healthier (HEI of 42.47 versus 40.82 for urban consumers), but this difference is not statistically significant. Also, food expenditures of rural and urban consumers are not statistically different.

Predictably, rural consumers live in less dense food environments. They have almost 10 times less restaurants around them than do urban consumers (table 8.5). Rural consumers have only 0.73 FF restaurant within 1 mile of their home, whereas urban consumers have 7.6. If rural consumers have to drive 6.0 miles to the nearest fast-food restaurant, urban consumers can find one by driving just 0.6 mile. The distance to the nearest supermarket is 6.6 miles for rural consumers and 1.4 miles for urban ones. The large differences in distance do not always translate into large differences in travel time. For example, average distance to the primary store is 10 miles for rural consumers and 2.6 miles for urban consumers (3.8 times as far), whereas the driving time to the primary store is 16 minutes for rural consumers and 6.6 minutes for urban consumers (just 2.4 times as lengthy).

Table 8.4
Diet quality of consumers who patronize restaurants at different frequencies

	Restaurant non-consumers	Occasional fast-food (FF) consumers	Frequent FF consumers	Occasional FF and full-service (FS) consumers	Frequent FF and FS consumers
Full-service restaurant meals	0.00**	0.00**	0.00**	1.51**	1.46**
	(0.00)	(0.00)	(0.00)	(1.04)	(0.96)
Fast-food meals	0.00**	0.88**	3.28**	0.66**	3.31**
	(0.00)	(0.37)	(1.62)	(0.52)	(1.68)
Fruits (cups)	7.3	7.5	7.2	9.4	8.0
	(8.7)	(7.5)	(7.8)	(11.0)	(8.1)
Vegetables (cups)	15.4	12.8**	13.1**	16.6**	15.8
	(17.4)	(15.5)	(11.1)	(15.8)	(12.8)
Vegetables, dark green (cups)	1.8	1.6	1.7	2.8**	2.4
	(4.0)	(8.9)	(3.7)	(8.6)	(4.9)
Refined grains (oz)	45.8	43.4	48.3	47.5	54.9**
	(45.1)	(41.3)	(40.1)	(43.9)	(40.2)
Whole grains (oz)	7.2	7.2	8.0	7.3	8.3
	(12.4)	(13.4)	(11.6)	(12.1)	(10.3)
Fish, plant protein (oz)	10.1	8.8**	8.8	15.4**	10.8
	(30.9)	(12.8)	(14.7)	(20.3)	(17.2)
Meats (oz)	47.9	38.4**	46.4	54.4	50.2
	(57.8)	(35.7)	(44.8)	(49.7)	(36.6)
Energy (kcal)	18,101	16,803	18,200	18,896	19,890
	(13,692)	(11,993)	(12,140)	(12,093)	(10,856)
Carbohydrates (gram)	2,222	2,081**	2,272	2,297	2,399**
	(1,704)	(1,561)	(1,592)	(1,580)	(1,403)
Saturated fat (gram)	246	221**	233	243	265**
	(229)	(178)	(182)	(187)	(174)
Alcohol (gram)	40	23**	30**	49	63**
	(102)	(69)	(83)	(96)	(127)
Added sugars (gram)	165	154	171	163	168
	(191)	(173)	(186)	(168)	(135)
Sodium (mg)	42,433	30,280	30,915	38,881	33,700
	(58,808)	(40,634)	(43,376)	(47,550)	(45,593)
Healthy Eating Index 2010	50.9**	52.4	52.0	55.5**	53.4
	(15.1)	(13.4)	(13.0)	(13.2)	(12.6)
Shares	0.19**	0.19**	0.18**	0.22**	0.22**

Notes: The statistics are calculated using population weights and stratification information available in FoodAPS. ** indicates a statistically significant difference from the average (5 percent). Standard errors are in parenthesis.

Source: USDA, Economic Research Service using data from USDA's National Household Food Acquisition and Purchase Survey (FoodAPS), 2012.

Table 8.5

Urban-rural differences in frequency of food away from home, diet, food expenditures, and distance to restaurants

	Rural	Urban
Full-service restaurant meals	0.75	0.65
S.E	(0.89)	(0.81)
Fast-food Meals	1.54**	1.85**
S.E	(1.48)	(1.76)
Total expenditures, dollars	175.10	175.94
S.E	(134.42)	(140.40)
Healthy Eating Index, 2010	42.47	40.82
S.E	(16.17)	(16.09)
# fast-food restaurants within 1 mile	0.73**	7.55**
S.E	(2.30)	(6.98)
# fast-food restaurants within 10 miles	22.13**	191.79**
S.E	(32.89)	(179.31)
# full-service restaurants within 1 mile	2.71**	39.83**
S.E	(5.16)	(64.07)
# non-fast-food restaurants within 10 miles	86.76**	872.12**
S.E	(132.50)	(993.71)
Distance to the nearest fast-food restaurants (miles)	6.04**	0.60**
S.E	(5.17)	(0.61)
Distance to the nearest full-service restaurants (miles)	2.20**	0.38**
S.E	(1.98)	(0.44)
Distance to nearest supermarket (miles)	6.64**	1.36**
S.E	(6.09)	(2.45)
Driving distance to the primary store (miles)	9.96**	2.61**
S.E	(9.94)	(3.20)
Driving time to the primary store (minutes)	15.99**	6.57**
S.E	(11.68)	(4.69)

Notes: The statistics are calculated using population weights and stratification information available in FoodAPS. S.E. = standard error. ** indicates a statistically significant difference from the average (5 percent). Standard errors are in parenthesis.

Source: USDA, Economic Research Service using data from USDA's National Household Food Acquisition and Purchase Survey (FoodAPS), 2012.

Conclusion

Occasional fast-food (FF) and full-service (FS) restaurant consumers tend to live near grocery stores and occasional FF consumers tend to live close to fast-food restaurants. Although some evidence shows that restaurant consumers of all kinds (four clusters) are more likely to live in areas with a high concentration of restaurants compared to restaurant nonconsumers, the differences are not statistically significant in most cases. Furthermore, consumers in rural areas have far fewer restaurants nearby, but they consume only slightly fewer restaurant meals than urban consumers.

Assuming that those who prefer fast food are only slightly more likely to live near fast-food restaurants than those who do not, the results suggest that fast-food consumers respond more strongly to convenience (short distance) than to a variety (density) of restaurants.[68] In addition, full-service consumers are not as sensitive to the proximity of restaurants as are fast-food consumers.

The results from the diet quality analysis are mixed. Frequent FF and FS consumers purchase the most calories in a week, which is consistent with previous research. Occasional FF consumers purchase the *least* calories, significantly less than restaurant nonconsumers. Considering the association between high calorie content and FAFH, this result is somewhat unexpected, but could, in part, be explained by how FoodAPS collects data. FoodAPS gives information on food acquisitions, and so it is likely that nonconsumers are purchasing more food than they actually consume on a weekly basis. In other words, when calorie content is matched to purchases, it may give an inflated approximation of calories consumed, while those who purchase FF are more likely consuming all of the food they purchase in that week.

There is little evidence that supports claims that fast-food meals are associated with poorer diet quality. For example, the Healthy Eating Index (HEI) of nonconsumers tend to be slightly lower than FF consumers. This is perhaps because nonconsumers purchase more saturated fat, sodium, and alcohol than FF consumers even though nonconsumers purchase more vegetables, meats, and fish/plant proteins. Additionally, this analysis finds no evidence that frequency of restaurant meal purchases is associated with BMI.

People from higher socioeconomic status tend to eat healthy (Darmon and Drewnowski, 2008), which partly explains the lack of correlation between frequency of restaurant meal purchases and diet quality. Restaurant consumers—especially those who frequent full-service restaurants—have much higher socioeconomic status than those who do not dine out often. They are more educated, have higher incomes, are more likely to be married, and more likely to be employed. Therefore, restaurant consumers who tend to have high socioeconomic status may be consuming healthy meals at restaurants, resulting in no statistically significant differences in diet quality and BMI compared to restaurant nonconsumers.

No causal inference can be drawn from these observational findings without a more rigorous econometric analysis. This report shows that demographic characteristics are strong correlates of frequent restaurant meal consumption and that food environments are not. Future research can examine whether these associations are causal.

[68]The distance measure is arguably more exogenous than the density measure, since consumers who prefer eating FAFH may choose to live in areas with a high density of restaurants but are less likely to move close to a particular restaurant.

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