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America's Eating Habits: Food Away From Home

Michelle J. Saksena, Abigail M. Okrent, Tobenna D. Anekwe, Clare Cho, Christopher Dicken, Anne Effland, Howard Elitzak, Joanne Guthrie, Karen S. Hamrick, Jeffrey Hyman, Young Jo, Biing-Hwan Lin, Lisa Mancino, Patrick W. McLaughlin, Ilya Rahkovsky, Katherine Ralston, Travis A. Smith, Hayden Stewart, Jessica Todd, and Charlotte Tuttle

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Abstract

Food away from home (FAFH) has become increasingly integral to the American diet. In 2010, the share of Americans' food budget for FAFH—reaching 50 percent (up from 41 percent in 1984)—surpassed the share for food at home (FAH) for the first time. Likewise, Americans' share of energy intake from FAFH rose from 17 percent in 1977-78 to 34 percent in 2011-12, with differences in growth across types of FAFH (e.g., full- and quick-service restaurant foods, school meals, etc.). Along with the demand for FAFH, availability of FAFH has also increased, with much of the growth in recent years attributable to quick-service restaurants. The growing presence of FAFH in Americans' diets reflects changes in consumer demand and producer behavior and affects the health and nutrition of individuals over time. This report takes a comprehensive look at the role of FAFH in American diets, exploring nutritional composition of FAFH and key Federal programs that may influence FAFH. The report also discusses how FAFH choices and availability relate to diet quality, income, age, and other socioeconomic factors.

Keywords: food away from home (FAFH), food at home (FAH), diet, nutrition, health, food assistance, food consumption, school lunch programs, fast food, quick service, limited service, full service, food expenditures, the Great Recession, Healthy Eating Index (HEI), Food Acquisition and Purchases Survey (FoodAPS), Food Expenditure Series, National Health and Nutrition Examination Survey (NHANES), menu labeling, restaurant location

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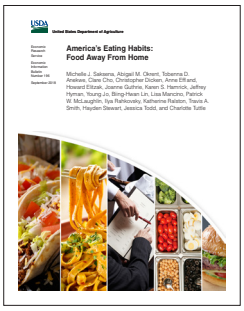
Contents

United States Department of Agriculture

A report summary from the Economic Research Service September 2018



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.

America's Eating Habits: Food Away From Home

Chapter 1—Introduction

This chapter gives a comprehensive summary of this report's findings about FAFH choices and availability, nutrient intake from FAFH, associations between FAFH and diet quality, and associations between FAFH and sociodemographic characteristics. It shows the potential drivers of trends in demand and supply of FAFH and describes current policies that may affect these outcomes. This chapter also discusses the limitations and advantages of the various data sources used in each chapter.

In 2014, fewer than 60 percent of suppers served at home were actually cooked at home, down from 75 percent in 1984 (Ferdman, 2015). The decreasing time spent on meal preparation and cooking reflects the primacy of food away from home (FAFH) in Americans' routines. Americans aged 18 and over spent 65 minutes in meal preparation and cleanup in 1965 (Cutler et al., 2003), but by 2014, prep and cleanup time had fallen to 37 minutes per day (Hamrick and McClelland, 2016). This trend of cooking less and consuming more FAFH is not expected to subside for at least as long as Millennial consumers[1]—who have a greater preference for prepared foods and more disposable income than older age groups do—continue to enter the workforce (Kuhns and Saksena, 2017).

Using data from the Economic Census, table 1.1 shows the number of retail establishments and their sales (food and beverage stores, and other retail stores) and foodservice industries for two types of products—"on-premise foods" and "off-premise foods"—between 1977 and 2012.[2] The food retail landscape has changed in the past 30 years, both in terms of access to different types of food stores and selection of foods they offer. For example, in 1977, there were about 5.9 food stores, of any kind, for every 1,000 Americans, and 25 percent of these stores sold food for on-premise consumption.[3] At that time, food offerings were more clearly delineated by food store outlet type. Most on-premise food purchases were at foodservice establishments, while the majority of off-premise foods were purchased in retail establishments like grocery stores. By 2012, the number of foodservice establishments had increased by 77 percent, while the number of retail establishments declined between 25 to 50 percent. Even though the number of retail establishments decreased, nearly 40 percent of them offered food for on-premise consumption, a fivefold increase.

Because FAFH composes about 33 percent of daily calorie consumption for the average American and is associated with overall poor diet quality, policymakers, health practitioners, and researchers have suggested several policies to curb the purchase and consumption of prepared foods, especially

[1]The "Millennial" generation comprises those born between 1981 and 1996.

[2]It is important to note that foods are classified by the retailer, and thus the on-premise consumption category may not capture all prepared and ready-to-eat food sold from grocery and other food retail stores. Nonetheless, on-premise foods generally refer to meals and snacks that are prepared at the outlet and meant to be consumed there (essentially, FAFH) while off-premise foods are those intended to be consumed away from where they were purchased (FAH).

[3]Foodservice establishments are commercial brick-and-mortar operations whose primary business model is to sell food for onsite consumption.

foods from foodservice establishments. Most of these policy ideas center on encouraging consumers to make healthier food choices at foodservice establishments and incentivizing prepared food suppliers to offer healthier alternatives. Potential policies include restricting quick-service[4] television advertising from targeting children, serving smaller entree portion sizes, standardizing serving-size information, zoning to limit access to restaurant foods, requiring menu labels, reformulating school lunches, and providing subconscious cues in school cafeterias to guide children to healthier foods. Many of these policies have been tried in local jurisdictions and even nationally, but it is too soon to tell if they can improve diet quality.

This report provides a comprehensive, in-depth look at FAFH's growing role in Americans' diets with a view to informing the affected sectors and policies. Several specific questions are addressed:

1. What kinds of foods are considered "food away from home" (FAFH)?
2. How does FAFH availability affect Americans' food choice behaviors, energy intake, and diet quality?
3. What groups by age, income, and other demographic criteria are most likely to purchase FAFH?
4. How has the availability of FAFH changed over time?
5. To what degree is FAFH correlated with lower diet quality?
6. What is the potential for current and proposed policies to affect the healthfulness of FAFH purchases and consumption?

Trends and Themes Surrounding FAFH

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. Food choices and availability are discussed in chapters 2-6 and analyze FAFH expenditures, purchase frequency, location, and access. Nutrition and diet quality are discussed in chapters 7 and 8 and analyze the nutrient composition of FAFH over time and correlation between diet quality FAFH frequency. Chapters 9 and 10 discuss policies related to FAFH, including food assistance programs and menu labeling.

Chapter 2 sets the stage for the current state of FAFH, chronicling the evolution of the FAFH landscape over time. Beginning in the mid- to late-19th century, the precursors to modern FAFH were street vendors, lunch wagons, diners, soda fountains, luncheonettes, and cafeterias. By the 1920s and '30s, technological innovation in food processing, the invention of the automobile, and increases in women's labor force participation (which generated more household disposable income) increased demand for FAFH consumption. To keep up with increasing demand, restaurants adopted more permanent structures with seating for families. Chain restaurants designed to accommodate automobile-based customers proliferated across the Nation, offering low-cost, fast, and predictable food. All of these factors led to long-term growth in availability and demand for FAFH.

[4]Throughout the report the terms fast food, limited service and quick service are used interchangeably to denote restaurants that offer counter service, but do not have wait staff that continually tend to customers. Within this outlet type, fast-casual restaurants offer mainly just counter service, but servers do bring food to individual tables. Full-service and sit-down denote restaurants where wait staff continually serve seated customers throughout their meal.

Table 1.1

Comparison of prices, sales, and number of establishments for select industries selling foods[1]

Industry[2]	Price index (100=1982-84)[3]	Number of establishments per 1,000 persons			Nominal per capita sales			Real per capita sales		
		Total	Selling on-premise meals and snacks	Selling off-premise food	Total	On-premise meals and snacks	Off-premise food	Total	On-premise meals and snacks	Off-premise food
1977										
Total retail and foodservice	65.7	5.92	1.55	1.23	3,177	249	624	48.34	3.78	9.50
Food and beverage stores	66.8	0.94	0.13	0.83	749	2	595	11.21	0.04	8.91
Other retail stores	66.8	3.90	0.34	0.38	2,181	23	28	32.65	0.34	0.42
Eating and drinking places	62.6	1.08	1.08	0.03	247	224	1	3.95	3.57	0.01
2012										
Total retail and foodservice	234.2	5.29	2.31	1.23	15,070	1,490	2,063	64.34	6.36	8.81
Food and beverage stores	231.8	0.47	0.18	0.42	1,975	42	1,305	8.52	0.18	5.63
Other retail stores	231.8	2.91	0.28	0.73	11,464	57	752	49.46	0.25	3.25
Eating and drinking places	238.0	1.91	1.85	0.08	1,631	1,390	5	6.86	5.84	0.02
Percentage change										
Total retail and foodservice	256.4	-10.66	49.59	-0.03	374.32	499.27	230.29	33.09	68.15	-7.32
Food and beverage stores	247.0	-49.94	41.76	-48.82	163.62	1648.51	119.11	-24.02	403.94	-36.85
Other retail stores	247.0	-25.35	-18.36	93.59	425.60	154.25	2563.57	51.49	-26.72	667.67
Eating and drinking places	280.2	76.60	71.79	164.15	560.31	521.89	635.24	73.69	63.58	93.40

[1]Industries that sell food that are excluded from the present analysis include recreational places (e.g., movie theaters, museums, sporting events, performances), hotels and motels, civic and social organizations, transportation (e.g., airlines and trains), and food furnished as an ancillary activity (e.g., inpatient meals at hospitals). According to USDA/ERS's Food Expenditure Series, these sales were on average 11-12 percent of total food sales between 1977 and 2012.

[2]For the 1977 Economic Census, the relevant Standard Industry Classification (SIC) industry codes used in this analysis are: G (Retail Trade), 54 (Food Stores), 592 (Liquor Stores), and 58 (Eating and Drinking Places). For the 2012 Economic Census, the relevant North American Industry Classification System (NAICS) industry codes used in this analysis are: 44-45 (Retail Trade), 445 (Food and Beverage Stores), and 722 (Food Services and Drinking Places).

[3]The price index for total retail and foodservice is derived as a weighted average of food-at-home (FAH) and food-away-from-home (FAFH) Consumer Price Indices (CPI), with nominal per capita sales for each outlet type as weights.

Source: U.S. Department of Commerce, U.S. Census Bureau, 1977 Economic Census (1979); U.S. Department of Commerce, U.S. Census Bureau, 2012 Economic Census (2016); Consumer Price Indices (CPI) for FAH and FAFH (Bureau of Labor Statistics, 2017); and U.S. Department of Commerce, U.S. Census Bureau, Census population estimates (2000, 2016)

Over the past century, changes in work and in attitudes toward family, children, and leisure time shaped food preferences and eating routines. Rising incomes, more two-earner households, and improved affordability and access to fast-food establishments may have all contributed to growing FAFH demand. As households became increasingly more time constrained—as a result of greater educational attainment and increases in women's participation in the labor force—it raised the opportunity cost of their time, making time-intensive meal preparation less attractive. As a result, FAH-preparation times have declined while FAFH-consumption rates have increased over time. Tastes and preferences are also shaped by sociodemographic characteristics, including race, ethnicity, education, and household composition (i.e., marital/partnered status of household manager, age and gender of household manager, number of household members, and number of children). Chapter 3 discusses how these factors may have influenced observed macroeconomic growth in FAFH expenditures.

As several chapters note, the Great Recession (December 2007 to June 2009) marked a departure from the long-term growth trend in consumer spending on FAFH. As unemployment climbed, households had more time for leisure and household activities like meal preparation and less disposable income to purchase FAFH (Beatty and Senauer, 2012). Chapter 3 shows that, unlike in previous economic downturns since 1987, long-term growth in FAFH spending reversed during the Great Recession and only began to rebound in 2011. The decline in total FAFH spending during this period largely manifested in decreased spending at full-service restaurants, while spending at quick-service restaurants grew, albeit at a slower rate than before the Great Recession. By 2010, the share of food spending by both businesses and households that purchased FAFH surpassed the FAH share for the first time.

Economic downturns likely affect demand for FAFH by constricting consumers' budgets and relaxing time constraints, but their responses are also shaped by differences in income, household structure and composition, education, race, and ethnicity, which are all found to influence American tastes and preferences. Chapter 4 examines food expenditure patterns of households by different sociodemographic groups before and after the Great Recession, particularly emphasizing substitution among prepared foods purchased at full- and quick-service restaurants and at retail stores. During the Great Recession, as the share of household food expenditures allocated to FAFH declined, the share of spending on prepared and unprepared FAH ingredients increased, and these trends continued through 2014 for most household types, suggesting a general shift toward more home-cooked meals.[5] Overall, changes in spending allocations across FAFH categories between 2005 and 2014 were relatively small, with the largest change from 1 year to the next being less than 1 percentage point for all categories, whereas spending patterns differed quite substantially across household types.

Prices of FAFH have generally outpaced those of FAH as shown in table 1.1 (247-percent increase for food and beverage stores versus a 280-percent increase for eating and drinking places since 1982-84). Thus, inflation may partially explain some of the observed growth in nominal FAFH spending and household expenditures discussed in chapters 2 and 3, but data also show that Americans consume meals and snacks from FAFH establishments with increasing regularity. In 1977-78, 16 percent of meals and snacks were obtained at restaurants, schools, vending machines, mobile vendors, or through donations, and this share increased to 24 percent in 1995 (Lin et al., 1999). Meals from restaurant

[5]While the 2008 commodity price spike occurred during the Great Recession, prices of FAH spiked, but prices of FAFH did not follow this trend. This finding suggests that American consumers would have substituted out of FAH and into FAFH because these products are generally found to be net substitutes (Okrent and Alston, 2012; Huffman, 2011). However, the opposite occurs because income declines during the Great Recession dominated the substitution effects.

purchases alone constituted 23 percent of meals purchased in 2004, though that share dropped significantly during the recession and eventually stabilized to 20 percent of meals in 2012, according to data from the NPD group (Business Wire, 2004; Sloan, 2016).

As examined in chapter 5, socioeconomic factors may affect not only how much consumers spend on FAFH, but also how often they consume it (measured as number of meals, number of eating occasions, etc.). In some cases, these trends in FAFH expenditures and the frequency of consumption may not exactly parallel each other. For example, higher income consumers may spend more on FAFH because they are more willing and able to spend for high quality than are lower income consumers. However, greater spending by higher income groups on FAFH does not necessarily translate into a greater number of FAFH meals. The same logic can be applied for differences between expenditures and frequency among groups with different races/ethnicities, household composition (with or without children), and education.

Chapter 5's analysis supports several key results in the literature that are discussed in chapter 4, including the finding that FAFH consumption increases with income, education, and employment status and decreases with the number of children. In addition, younger adults tend to consume FAFH more frequently than others: the peak years for FAFH are 35-44 years old, which may be due to higher labor force participation and higher income in that age range.

As chapter 2 notes, food choices evolved to increasingly favor FAFH, and the supply and availability of FAFH grew to meet this demand. Related to this, chapter 6 shows how supply of FAFH grew both in terms of sales and number of establishments, with changes in the composition and structure of restaurants. In particular, roughly 57 percent of all FAFH establishments in 2015 were quick-service restaurants, 66 percent of which were chains, which was the fastest growing subsegment of the past 15 years, growing even during the Great Recession. Full-service restaurants were particularly hard hit by the Great Recession, with the number of establishments declining 5 percent after peaking in 2009.

While spending at full-service restaurants decreased during the Great Recession, spending at quick-service restaurants grew, albeit at a slower rate than pre-recession. Chapter 6 details that although full-service restaurants consistently made up the largest share of FAFH spending, from 2000 to 2015, quick-service restaurants drove much of the growth in spending on FAFH. The fastest growth of the quick-service segment is largely driven by fast-casual restaurants, a hybrid of quick- and full-service restaurants, which grew at twice the rate of traditional quick-service restaurants between 2000 and 2015. Fast casuals offer the convenience and prices of quick-service restaurants with the perceived high-quality food and ambiance of full-service restaurants. As Americans continued to migrate from rural areas to cities in 2000-15, full-service restaurants were particularly affected, leaving the FAFH landscape in rural areas dominated by quick-service restaurants, which may have implications for healthfulness of purchases and consumption.

Although healthy FAFH is available, Americans tend to select items that have more calories, fat, and saturated fat than home-produced foods (Lin and Guthrie, 2012). Chapter 7 examines the nutrient and energy intake from foods obtained from restaurants, schools, and places other than home in 1977-78 and 2011-12. The share of calories obtained from FAFH rose from 18 percent in 1977-78 to 34 percent in 2005-06, with consumption of quick-service foods being the largest source of this growth. The share of calories obtained away from home briefly dipped to 29 percent in 2009-10, paralleling the decline in FAFH expenditures and sales between 2007 and 2010 described in chapters 3, 4, and 6. However, on a percentage basis, consumption at full-service restaurants

declined more than at quick-service restaurants, indicating some economizing within FAFH options, which is also consistent with expenditure and sales patterns.

Post-Great Recession, by 2011-12, chapter 7 notes that FAFH consumption had risen again to comprise 34 percent of calories, essentially double the share of intake from 1977-78, and quick service grew to 15.8 percent of calories. Lower income individuals consumed more FAFH over time, but less than higher income individuals did, which parallels observations on FAFH expenditure patterns in chapter 4. Over time, the energy intake of children and youth from FAFH—particularly from quick service—grew in parallel to that of adults, but at the same time, the role of school foods diminished for all children and youth and diminished more for those of higher income households. FAFH is still found to have more total fat, saturated fat, and sodium than FAH, and FAFH contains less fiber, iron, and calcium (with the exception of school foods, which have more calcium and iron than FAH).

A related concern to the nutrient composition of FAFH is whether greater access to FAFH establishments influences diet quality (i.e., adherence to USDA's Dietary Guidelines for Americans). To understand whether the increased presence of FAFH establishments can potentially affect food choices and diet quality, chapter 8 investigates the associations among restaurant density, consumers' proximity to quick- and full-service restaurants, and diet quality of five types of consumers by frequency of purchase—nonconsumers (i.e., people who did not purchase from either quick- or full-service restaurants), frequent quick-service consumers, frequent quick- and full-service consumers, occasional quick-service consumers, and occasional quick- and full-service consumers. This analysis finds that frequent quick-service consumers live close to quick-service restaurants, but compared with nonconsumers, do not tend to live in areas with high concentrations of restaurants, which may imply that quick-service consumers respond more to the proximity of restaurants than to the density of restaurants around their home. Additionally, although frequent quick-service purchasers purchased less vegetables, fish, and nuts, their overall diet quality was no worse than that of nonconsumers. This finding suggests that increases in quick-service density and proximity are not associated with reductions in diet quality. In addition, restaurant density in rural areas is substantially less than in urban areas, but rural consumers purchase only slightly fewer restaurant meals.

Several policies have been proposed to help consumers choose healthier FAFH and incentivize FAFH suppliers to provide healthier food options. One such option is restricting marketing of unhealthy foods to children for quick-service foods, and some studies have found that bans on television advertising targeting unhealthy foods to children have meaningful effects on calorie intake and obesity (Chou et al., 2008; Dhar and Baylis, 2011). However, some have argued that the U.S. Constitution might not permit any such regulations to be applied in the United States because of the First Amendment protection of free commercial speech, which imposes limits on what the Government can do to restrict marketing otherwise (Ippolito, 2011). Limiting access to restaurant foods is another potential policy intervention. But such restrictions have not been consistently found to affect obesity (Sturm and Hattori, 2015; Currie et al., 2010).

Current programs that provide food assistance to combat food insecurity and support low-income families in making food choices consistent with USDA's Dietary Guidelines may also influence FAFH purchasing and acquisition decisions directly and indirectly. The National School Lunch Program (NSLP) and School Breakfast Program (SBP) directly affect FAFH purchases by providing free or low-cost meals to children in schools. (For more details, see U.S. Department of Agriculture, Food and Nutrition Service, 2016.) The foods served in these programs must meet certain Federal

meal standards (MacEwan and Okrent, 2017). Indirectly but significantly, the Supplemental Nutrition Assistance Program (SNAP) can affect FAFH spending by providing benefits that can be used only for FAH spending. Most studies indicate that an extra dollar of SNAP benefits is much more likely to be spent on FAH than is an extra food dollar of cash. The share of that extra SNAP dollar spent on food, referred to as the marginal propensity to spend (MPS) on food from SNAP benefits, has been estimated to be $0.17 to $0.53 while the MPS for cash is estimated to be $0.05-$0.10. The extra dollar in SNAP benefits would all be spent on FAH as required, but it frees up household cash to be spent on other things, and the MPS measure takes that total effect into account (Tuttle, 2016; MacEwan and Okrent, 2017). For example, Kim (2016) examined SNAP recipients' nonfood expenditure response to the increase in benefits attributable to American Recovery and Reinvestment Act (ARRA) and found an increase in nonfood expenditures attributable to the increase in benefits.

Chapter 9 examines diet quality of children participating in the NSLP and SBP, and the diet quality and FAFH frequency of households participating in SNAP. Chapter 9 finds that school meals provided a higher Healthy Eating Index (HEI) for children than other sources of FAFH, consistent with other studies finding participation in NSLP enhances participants' nutrient consumption.[6] Because SNAP participants are more likely than higher income groups to participate in school meals, the higher diet quality of school meals is likely part of the reason that the HEI for FAFH is almost as high for SNAP households with children as for SNAP households without children, while for SNAP nonparticipants, the HEI for FAFH is lower for households with children compared to those without children.

Menu labeling at restaurants is another policy option that may engender more healthful eating away from home by Americans. Debate over mandatory menu labeling grew during the 2000s as it became clear that eating out was associated with less healthful food choices (e.g., Variyam, 2005). Chapter 10 describes how representatives in the public health, nutrition, and foodservice sectors have collaborated with policymakers to craft a menu labeling rule, which requires restaurant chains with 20 or more establishments to make calorie information publicly available. This rule was developed at the Federal level in response to the often confusing and contradictory menu labeling laws in local jurisdictions that had been difficult to implement for restaurants in multiple jurisdictions.

Chapter 10 shows that the current evidence on how menu labeling would affect food choices and calorie intake is quite mixed, with some studies finding no effect and others finding a reduction of up to 177 calories per order or purchase. One study found that, on average, providing point-of-purchase calorie information in chain restaurants reduced body mass index (BMI) by 1.5 percent and lowered the risk of obesity by 12 percent in jurisdictions with such laws (Restrepo, 2017). Similarly, the response of the foodservice industry to menu labeling regulations in local jurisdictions is mixed, with some restaurants increasing the number of low-calorie offerings on the menu and some not.

Data and Definitional Nuances of FAFH

This report uses several datasets to conduct analysis on FAFH, and the datasets differ in defining FAFH and types of foodservice establishments. As a consequence, there are variations in the results depending on the datasets used. Generally, FAFH is defined as being obtained, although not exclu-

[6]Constructed by USDA's Center of Nutrition Policy and Promotion and the National Cancer Institute, the HEI is a measure that determines diet quality. For a more indepth explanation, see chapter 8.

sively, from restaurants, cafeterias, food trucks, and vending machines. In contrast, foods prepared within the home and obtained from retail establishments like grocery stores, warehouse clubs, supercenters, and mail order are commonly referred to as food at home (FAH). Prepared foods, however, have increasingly become a greater share of foods sold at retail stores as well, and they could also be considered FAFH, given how closely they resemble food purchased at foodservice establishments. Table 1.2 summarizes the data used and the corresponding terms used in defining FAFH in this report.

Most data sources base the distinction between FAH and FAFH on the type of outlet where food is purchased. FAFH establishments include restaurants, schools, vending machines, and mobile food vendors, and FAH establishments are retail stores like grocery stores, warehouse clubs, roadside stands, and mail order and home delivery.

These definitions are used in some publicly available data used in this report, including:

1. Household food expenditure data from the Consumer Expenditure Series (CES);
2. Prices paid by consumers in the Consumer Price Indexes (CPIs);
3. Store counts in the Quarterly Employment and Compensation Survey; and
4. Sales in the Monthly Retail Trade and Foodservices report and the Economic Census.

Except for the CES, which is collected from households, all of these data are collected from foodservice establishments. Foodservice data classify establishments by the North American Industry Classification System (NAICS). FAFH establishments under NAICS include full-service restaurants (wait staff), limited-service restaurants (counter service), and "other FAFH" (caterers, mobile food vendors, vending machine operators, food contractors). (See chapter 6 for more details.) The CES classifies FAFH as full- and limited-service restaurants, vending machines, and caterers. (See chapter 4 for more details.)

Proprietary data sources are also used in this report. The NPD ReCount data collects store location data and organizes these data by outlet type and restaurant brand. The Euromonitor data reports sales for branded restaurants and menu type (Italian, Mexican, etc.). The NPD ReCount outlet classification system is similar to NAICS, except that it calls restaurants with counter service "quick-service" rather than "limited-service." Analysis detailed in chapter 6 further breaks down limited- or quick-service outlet types—based on brand in the NPD ReCount and Euromonitor data—into a smaller subset called "fast casuals." (See chapter 6 for more details.)

Individuals and households not only purchase foods at different retail and foodservice establishments, but they can also obtain foods as gifts, donations, or grow them at home. The following datasets define FAFH based on where food is *acquired*: 2012-13 Food Acquisition and Purchases Survey (FoodAPS), 1977-78 National Food Consumption Survey (NFCS), 1989-91 and 1994-96 Continuing Survey of Food Intakes by Individuals (CSFII), 2001-12 Continuous National Health and Nutrition Examination Surveys (NHANES), and the American Time Use Survey (ATUS). In addition to places where food is *purchased*, food can be *acquired* as donations from food banks and commodity food programs, grown in a garden, given as a gift, and in other ways that do not require a purchase.

Table 1.2
Data sources and food-away-from-home definitions

Chapter	Data source	Description	FAFH definition	Food outlet types	FAFH measure
1	Economic Census[1]	Store-level sales data by NAICS code and product line	Where food is purchased (NAICS) and where food is intended to be consumed (on- and off-premise consumption)	Food stores, other retail stores and eating and drinking places	Number of establishments and sales
3	Annual ERS Food Expenditure Series[2]	Store-level sales data (i.e., 5-year Economic Census and annual Census survey data) augmented with the value of food produced at home and donated and the value of food furnished to employed civilians, military and individuals at institutions (e.g., prisons, hospitals, nursing homes and so on)	Where food is intended to be consumed	Retail stores; limited-service restaurants; full-service restaurants; drinking places; hotels and motels; retail stores; recreational places; schools and colleges; other FAFH (food furnished as part of another service)	Expenditures and expenditure shares of food
4	2005-14 Consumer Expenditure Series (CES)[2]	Two-week household food expenditure diary for stratified sample of individuals with sample weights to extrapolate to population	Where food is purchased	FAH (prepared food, microwavable food, edible ingredients, unprepared ingredients, non-alcoholic drinks, and other purchased at retail stores); limited-service restaurants, full-service restaurants; other FAFH (vending machines, caterers, schools)	Expenditures and expenditure shares of food
	2005-14 Monthly Consumer Price Indexes (CPI)[2]	Monthly national market basked of prices for prices paid by consumers for FAFH	Where food is purchased	FAH; full-service restaurants, limited-service restaurants, other FAFH	
5	2012-13 Food Acquisition and Purchase Survey (FoodAPS)	One-week household food expenditure diary for stratified sample of individuals with sample weights to extrapolate to population	Where food is obtained	FAH; FAFH; schools	Number of food trips per week
6	2000-15 NPD ReCount	Exact location and brand of restaurants	Where food is purchased	Chain and independent quick-service and full-service restaurants (includes fast-casual chains) and restaurant brands	Density of establishments and sales
	2006-14 Euromonitor	Sales at highest selling branded restaurants and type of menu	Where foods is purchased	Restaurant brands and menu types (hamburger, subs/deli/other sandwich; pizza/Italian; Mexican; other menu type)	

Continued—

Table 1.2
Data sources and food-away-from-home definitions—continued

Chapter	Data source	Description	FAFH definition	Food outlet types	FAFH measure
6	2001-15 Quarterly Census of Employment and Wages	Number of establishments	Where food is purchased	Mobile food vendors	Density of establishments and sales
	2001-15 Monthly Retail Trade and Foodservice Series[2]	Monthly sales	Where food is purchased	Full- and limited-service restaurants	
7	1977-78 National Food Consumption Survey (NFCS)	One day dietary recall quantities and nutrient intake for stratified sample of individuals with sample weights to extrapolate to population	Where food is obtained	FAH; wait-staff restaurants; fast-food restaurants; school/day care; other FAFH (vending machines, common coffee pot, mobile vendor)	Energy intake (calories) and nutrient density, measured as percent calories from fat, saturated fat; nutrient intake per 1,000 calories for other nutrients
	1989-91 and 1994-98 Continuing Survey of Food Intakes by Individuals (CSFII)				
	2003-2012 Continuous National Health and Nutrition Examination Surveys (NHANES)[1]				
8	2012-13 FoodAPS	One week household food expenditure diary for stratified sample of individuals with sample weights to extrapolate to population	Where food is obtained	Fast-food and full-service restaurants	Frequency and diet quality
9	2012-13 FoodAPS	One week household food expenditure diary for stratified sample of individuals with sample weights to extrapolate to population	Where food is obtained	FAH; FAFH	Diet quality

[1]Data are available for other years but not used in the analyses presented in this report.
[2]Prior years of NHANES collect dietary recall data on where the food was consumed rather than where it was prepared.
Notes: FAFH = food away from home. FAH = food (prepared) at home.

Source: Various chapters within the report.

Among the aforementioned datasets, the NFCS, CFSII, and NHANES are 24-hour dietary recall surveys, which record quantities of foods consumed by individuals by outlet type (e.g., grocery stores, full-service restaurant, fast-food restaurant) and other sources (e.g., public donation, office coffee fund). These data are converted to nutrient intakes (fat, calories, sodium, etc.) and cup equivalents, which allow an interested user to assess the overall diet quality of the individual. (See chapter 7 for more details.) The FoodAPS is a week-long household diary that records, by acquisition source, the quantities, prices, and expenditures of foods acquired by all household members. The FoodAPS data also include nutrition intake data derived from the food acquisitions, which are used in chapters 8 and 9 to assess diet quality. The ATUS is a 24-hour time use diary in which individuals report the time they spent eating and drinking out (at either full- or quick-service restaurants) or elsewhere and the time spent in food preparation and cleanup.

FoodAPS is similar to the CES except that it collects food acquisitions from all sources, including home gardens and government commodity donation programs, besides the typical food establishments. Also, FoodAPS differs from CES because it oversamples low-income and SNAP-participating households. These data generally classify FAFH establishments similarly to NAICS (i.e., full service, limited service), but with some additional nomenclature to account for nonpurchase acquisitions. This generally affects what is contained in the "other FAFH" category across the chapters.

FoodAPS differs from NFCS, NHANES, and CFSII in another key way: FoodAPS collects data on food acquisitions, and the others collect data on actual food consumption. This data difference could cause differences in measured quantities because many FAFH portion sizes (especially for restaurant foods) are often large and individuals may not always consume whole portions. Hence, reported quantities in the food acquisition diaries are likely to be higher than the dietary recall data. Also, FoodAPS contains nutritional intake information for the entire household while NHANES, NFCS and CSFII are based on individual intake. For measuring nutrient and energy intake for distinct groups like children or food assistance participants, individual intake information (as used in chapter 7) would be more useful than household information.

Rather than defining FAH and FAFH by where they are *acquired*, as is typical, a few data sources, such as the Economic Census, define these terms based on where food is intended to be *consumed*. In this context, FAFH is food meant for on-premise consumption—meals and snacks prepared and consumed at any type of establishment except for home—and FAH being food meant for off-premise consumption—ingredients to meals and snacks purchased at any establishment and prepared at home. Foods are defined by type of product because foods that are more similar in form are categorized as the same, regardless of where they are acquired.

The Economic Census data, discussed in the introduction, presents estimates of sales by NAICS industry and specifies whether food is meant for on- or off-premise consumption. Likewise, the Food Expenditure Series—an ERS data product that produces annual and monthly national-level estimates of the value of the food system—uses the same classification as the Economic Census to define FAFH. The Food Expenditure Series additionally disaggregates FAFH by outlet type. (See chapter 3 for more details.)

The Food Expenditure Series differs from other expenditure datasets like FoodAPS and CES by what is included in sales. FAFH in the Food Expenditure Series is total household and business expenditures, whereas other expenditure datasets capture only household spending. This difference is particularly relevant to measures of foodservice spending because approximately 10 percent of foodservice sales were expensed meals by businesses and government in 2012 (Census Bureau,

2016c). The effect of excluding business purchases from FAFH is apparent when inspecting the magnitude of and variation in the FAFH shares of the food budget by dataset. For example, in chapter 3, which utilizes the Food Expenditure Series, FAFH accounts for more than 50 percent of the food budget in 2016 while, in chapter 4, which uses CES data, FAFH accounts for only 44 percent of the food budget that same year. Additionally, with the inclusion of business expenditures in the Food Expenditure Series, chapter 3 shows that FAFH expenditures by all purchasers started to rebound in 2010. In contrast, based on the CES data which only captures household purchases, chapter 4 observes that the rebound in household FAFH spending started later in 2013. Like CES, FoodAPS (which is discussed in chapters 5, 8, and 9) captures household spending only, and average household spending on FAFH is similar between datasets (Clay et al. 2016).

By using multiple datasets, with various advantages and disadvantages stemming from their data collection methods, the report aims to give a comprehensive overview of FAFH and its implications for Americans' nutrition and health. For example, chapter 3 uses the annual ERS Food Expenditure Series, which captures sales from all purchasers and provides a macroeconomic look at FAFH spending, whereas chapter 4 uses the CES and CPI, which capture spending only at the household level (see table 1.2).

Although CES covers a narrower survey pool than the Food Expenditure Series, the advantage of CES is that food purchasing behavior can be further broken down by sociodemographic group and by income level—an option that is unavailable in the Food Expenditure Series. This more refined breakdown is crucial for tracking nutrition and health issues for which trends often differ by socio-economic groups. These measures (Food Expenditure Series and CES), however, may overstate the role of FAFH because expenditure trends reflect not only changes in quantities purchased but also changes in prices. Because prices of FAFH have outpaced FAH, the observed upward trends in FAFH spending shares may have been exaggerated.

The remaining chapters examine FAFH characteristics using measures that are independent of price. Chapter 5 measures FAFH using number of trips to FAFH establishments, and similarly, chapter 8 categorizes households by how often they frequent FAFH establishments. Measuring FAFH by frequency, however, does not capture the actual quantities consumed on each outing. Chapter 6 uses the number of restaurants in each U.S. county to approximate FAFH supply. Similar to the limits to the measures of FAFH spending, there are limits to supply measures because no data are collected on how much each store sells. This limitation makes it difficult to discern whether the placement of FAFH locations decisions are driven by supply or demand. Chapters 7 and 8 analyze FAFH in terms of nutrient composition and diet quality, which are useful for gauging the effects of FAFH in the overall diet.

Given that consumer food choices are driven by multiple influences—foods' contribution to diet and health outcomes as well as their price, locations, and other environmental and socioeconomic factors—all of the measures used in this report reveal useful aspects of FAFH's evolving role in American consumers' lifestyles, food budgets, diet, and health.

Conclusion

Over the past several decades, foods prepared outside of the home have become increasingly integral to the American diet. Many researchers are interested in the implications of increased FAFH consumption for health outcomes and for how food markets will adapt to accommodate changing tastes and preferences for FAFH. This report compiles research that investigates current trends in food-away-from-home (FAFH) choices and availability, nutrient intake from FAFH, and FAFH's associations with diet quality.

This report finds that, although FAFH consumption has generally increased in the past several decades, this trend was temporarily curbed during the Great Recession as Americans shifted a greater share of household resources toward prepared and unprepared food-at-home (FAH) ingredients. This countertrend toward more FAH purchases continued through 2014 for most household types.

Evidence shows consistent purchasing patterns across sociodemographic groups. For example, higher income households spent more on FAFH and had more FAFH purchase occasions. In addition, households with an elderly individual spent a smaller share of their food budget on FAFH. The older a household head was, the less frequently that household head purchased FAFH. Households with children spent a smaller share of their food budget on FAFH and had fewer purchase occasions of FAFH than their childless counterparts.

As overall demand for FAFH has grown, so has the supply, albeit heterogeneously by segment. Since 2000, the fastest growing segment of FAFH has been chain quick-service restaurants, which expanded even during the Great Recession. Within the quick-service segment, fast-casual restaurants, which are a hybrid between quick- and full-service restaurants, show the speediest growth—twice the rate of traditional quick-service restaurants. Similar to what was observed in the last century, much of the recent growth in FAFH establishments has occurred in urban U.S. counties, consistent with patterns of urban and rural migration.

Average American energy intake from FAFH consumption has doubled from 17 percent in 1977-78 to 34 percent in 2013-14. FAFH generally contains more saturated fats and sodium, and less calcium, iron, and fiber than FAH does. Related to the concern about FAFH's nutritional value is the question of whether greater access to FAFH establishments influences diet quality (i.e., adherence to *USDA's Dietary Guidelines*). Although frequent quick-service consumers purchased less vegetables, fish, and nuts, their overall diet quality was no worse than that of FAFH nonconsumers, which suggests that quick-service density and proximity to consumers are not associated with poor diet.

Because FAFH constitutes a substantial part of the typical American diet and is associated with poor nutrient intake and overall poor diet quality, policymakers, health practioners, and researchers have suggested policy solutions to curb the purchase of prepared foods from both foodservice and retail establishments. In one policy area, the U.S. Department of Health and Human Services' Food and Drug Administration (FDA) created menu label regulations that require chain restaurants with 20 or more locations to make calorie information publically available. This may help consumers make healthier choices and may also encourage restaurants to provide healthier options. However, a review of the literature on restaurant menu labeling and its effects on calorie consumption turns up mixed evidence.

Current food assistance programs that support low-income families in making choices consistent with *USDA's Dietary Guidelines* may also influence FAFH purchasing decisions. The benefits bolster these families' budgets, allowing them to purchase more food (both FAH and FAFH), as well as other goods. Additionally, new requirements for school breakfasts and lunches improve the nutrition of school meals, directly affecting children's diets. Evidence from the analysis in this report shows FAFH's average nutritional quality was consistently lower than that of FAH, and this finding held true for households across all income levels including households that participate in SNAP. This suggests that FAFH choices are heavily driven by consumer preferences. Alternatively, the National School Lunch Program is shown to improve nutrient consumption for participating households.

Several questions still remain to be answered. For example, figuring prominently in many of the chapters, the Great Recession marks a time during which household FAFH expenditures and sales declined; the number of FAFH establishments decreased; and the nutritional quality of FAFH relative to FAH seemed to improve. Full-service restaurants lost more business than quick-service did, and households appeared to replace full- and quick-service options with prepared FAH from grocery stores and other retail stores. Although some of the report's analysis found that FAFH consumption rebounded to pre-recession levels, this finding was not consistent with other analyses. Data from NPD Group shows that, in 2016, because of the increased interest in cooking among young adults, home cooking appeared to stabilize after decades of decline (NPD Group, 2016). Also, although sales of on-premise foods at all retail and foodservice establishments somewhat rebounded after the Great Recession, sales for the full-service segment did not, and the number of meals purchased by households at restaurants had yet to rebound by 2014 (NPD Group, 2014).

Full-service restaurants may also be slow to rebound after the Great Recession as a result of evolving demographics of the labor force. Baby Boomers,[7] who are core consumers of full-service restaurants are entering retirement and facing reduced income and are increasingly being replaced by Millennials in the labor force who prefer the high-quality quick-service option of fast casuals (Klara, 2017), at least at this point in their lifecycle. The question remains of how to disentangle enduring Great Recession's effects, if they exist, on FAFH demand. It also remains to be seen how generational preferences, which continue to evolve, will affect nutrient intake, overall diet quality, and health outcomes.

[7]The "Millennial" generation comprises those born between 1981 and 1996, and the Baby Boom generation comprises those born between 1946 and 1964.

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Chapter 2: A Brief History of Food Away From Home in the United States[8]

This chapter provides a historical overview of the growth in the food-away-from-home industry and the primary drivers of its growth in the 19th and 20th centuries in the United States. With the invention of automobiles, Americans became more mobile, and restaurant franchises grew to accommodate traveling Americans by offering low-cost, fast, and predictable food. In addition, increases in women's labor force participation spurred modern foodservice establishments to cater to families.

At the turn of the 20th century, the majority of Americans ate most of their meals at home, prepared from foods both grown at home and purchased from local stores. By the turn of the 21st century, the balance had shifted dramatically, with food eaten away from home rising to more than half of all food expenditures in the United States by 2014 (see chapter 3 for more details). Across the century, U.S. society changed in dramatic ways, transforming American eating habits. This brief historical essay surveys how the changing geography of work and urban life and changing attitudes toward family, children, and leisure time affected both food preferences and eating routines, moving a large share of U.S. eating away from the home and into a varied array of eating places and new foods.[9]

Colonial Era Through the 19th Century

Prior to the 20th century, many Americans—both rural and urban—ate away from home when they attended events like weddings, funerals, fairs, community socials, and shared work activities. However, attendees often brought food for these occasions from their homes or were fed with food prepared by other participants at the event. Eating food away from home that was prepared by and purchased from others began as an accommodation for travelers and transient workers, then developed with the rise of cities to serve resident workers and businesspeople. In the latter half of the 19th century, industrialization and urbanization spurred more rapid change. By the mid-20th century, the widespread adoption of the automobile, the increasing numbers of women working away from home,

[8]Use of commercial and trade names does not imply approval or constitute endorsement by USDA.

[9]The narrative in this essay appears in similar form in nearly all sources consulted, making the use of standard parenthetical citations awkward with repetitive multiple references. This essay draws from two of the most frequently cited sources, Richard Pillsbury's *From Boarding House to Bistro: The American Restaurant Then and Now* (Cambridge, MA: Unwin Hyman, 1990) and John Mariani's *America Eats Out* (New York: Morrow, 1991). Other sources that support and supplement the history include John A. Jakle and Keith A. Sculle, *Fast Food: Roadside Restaurants in the Automobile Age* (Baltimore: Johns Hopkins University Press, 1999); Anne Cooper Funderberg, *Sundae Best: A History of Soda Fountains* (Bowling Green: Bowling Green State University Popular Press, 2002); Linda Civitello, *Cuisine and Culture* (3rd ed., Hoboken, NJ: Wiley, 2011); Andrew Hurley, "From Hash House to Family Restaurant: The Transformation of the Diner and Post-World War II Consumer Culture," *Journal of American History* (Vol. 83, No. 4, 1997, pp. 1282-1308); Warren J. Belasco, "Toward a Culinary Common Denominator: The Rise of Howard Johnson's, 1925-1940," *Journal of American Culture* (Vol. 2, No. 3, 1979, pp. 503-518); and Michael Karl Witzel, *The American Diner* (Osceolo, WI: Motorbooks International, 1994).

Readers who would like to explore the subject further may also want to consult Richard J. S. Gutman, *American Diner: Then and Now* (Baltimore: Johns Hopkins University Press, 1993); Warren J. Belasco, *Appetite for Change: How the Counterculture Took on the Food Industry, 1966-1988* (New York: Pantheon, 1989); Michael Karl Witzel, *The American Drive-In* (Osceola, WI: Motorbooks International, 1994); Jim Heimann, *Car Hops and Curb Service* (San Francisco: Chronicle Books, 1996); David Gerard Hogan, *Selling 'em by the Sack: White Castle and the Creation of American Food* (New York: New York University Press, 1997); and Richard Osborn, *The American and His Food* (2nd ed. Chicago: Univ. of Chicago Press, 1941).

higher disposable incomes, and expanded leisure time had launched the transformation of the food landscape into its modern form.

Taverns, inns, and boarding houses were the earliest places to provide food for purchase by travelers and transient workers. By most accounts, while the food was often passable, the need to eat away from home was tolerated as an inconvenience. For the wealthy traveler, early offerings were perhaps more sanitary and the setting more private, but not by much. Luxury accommodations for eating away from home improved in the 19th century as a growing population of wealthy industrialists and their families demanded well-appointed dining at hotels and on trains, steamboats, and ocean liners.

Taverns could also function as drinking houses for local populations, and boarding houses became common as housing for young, single industrial workers by the early 19th century. Coffee houses and oyster houses, which began as specialty eateries, quickly became (respectively, although not exclusively) gathering places for businesspeople and sources of cheap meals for workers in the cities along the eastern seaboard. For the wealthy, hotel restaurants like Delmonico's in New York and Antoine's in New Orleans became destinations for conspicuous consumption at evening events and family gatherings. By the mid-19th century, French cuisine, as well as specialty American restaurants and elegant hotel dining, had appeared in most major U.S. cities.

Changes over the mid- to late-19th century in urban and industrial work patterns necessitated new kinds of eating places. The larger geographic spread of cities could make it difficult for boarding-house lodgers, as well as those with families, to return home for mid-day meals, prompting a variety of businesses to serve these emerging needs. Around the same time, better paid office workers began to choose lodging *without* meals over boardinghouses, favoring the "European plan" in their rental arrangements and opting out of the meals traditionally included with rooms. As a result of both changes, a variety of restaurants grew up to serve this new clientele. Street vendors, lunch wagons, diners, soda fountains, luncheonettes, plate houses, lunch rooms, and cafeterias all appeared or expanded as places for working men, and eventually women, to get a quick, cheap meal.

The Turn of the 20th Century

Street vendors were among the earliest to provide meals to industrial shift workers who could not meet the meal schedules of their boardinghouses or the taverns and other eating houses that offered meals only at set times. Early street vendors, who carried baskets of sandwiches and other simple food items for sale, gave way to the lunch wagon, first devised in 1872 by Walter Scott, in Providence, Rhode Island. A horse-drawn wagon sheltered Scott from inclement weather and enabled him to serve customers continuously without returning home for more stock. By 1887, another innovator, Samuel Messer Jones, used a wagon large enough to accommodate customers who wanted to come inside and eat their meals. The rapid expansion of these mobile eateries led, in the early decades of the 20th century, to city ordinances controlling their hours of operation. In response, vendors began to park their wagons, cover the wheels, and hook up to utilities, inventing the diner. Originally constructed from surplus trolleys, streetcars, and railroad dining cars, mass-manufactured diners came to epitomize this form of eating place by the 1920s.

Neighborhood restaurants that served fast, inexpensive meals to mostly white-collar workers—variously known as soda fountains, luncheonettes, and lunch rooms—began to appear after the Civil War in nearly every city. ***Lunch rooms***, which developed from the "plate houses" and earlier taverns, functioned as a 19th–early 20th century version of the fast-food restaurant—simple,

inexpensive food served quickly. ***Soda fountains***, which served soda water flavored with various syrups, became a popular addition to drug stores and candy stores, bringing in additional business and enabling customers to socialize on stools adjacent to the serving counters. By the 1880s, many soda fountains added light meals to their offerings, keeping their counters busy at times of day when sweets were less in demand and creating the ***luncheonette***. As temperance took hold, soda fountains and luncheonettes substituted for saloons as social gathering places; in fact, during Prohibition in the 1930s, many saloons transformed themselves into soda fountains and luncheonettes.

Cafeterias with self-service dining offered yet another innovation in quick, inexpensive eating. The earliest cafeteria, the Exchange Buffet in New York, opened in 1885 offering men only a self-service restaurant that greatly increased speed for office workers in a hurry and reduced costs for the restaurant by eliminating the need for table service. The tray was introduced in 1898 at the Childs Brothers' lunch room in New York and transformed the cafeteria from a standup counter arrangement into a sit-down table form. In 1902, Joseph Horn and Frank Hardart opened a specialized version of the cafeteria in Philadelphia called the Automat, based on a German design, which allowed customers to choose food items from a wall of coin-operated windowed compartments. The Automat concept expanded successfully in Philadelphia and New York, but failed to take hold in other cities.

Many early cafeterias were operated by nonprofits in working-class neighborhoods and by factories and other large employers to serve their own workers. The style of service caught on particularly in Los Angeles in 1905, and cafeterias came to be known as "California-style restaurants" when they spread to other areas. They became particularly popular in the South, where restaurants were in short supply. Cafeterias opened in 1915 in Washington, DC, and expanded rapidly with the influx of office workers to staff an expanding Federal Government during the First World War.

As eating places changed, so did the food they served. Early boarding houses, restaurants, and lunch places offered hot, home-style meals mimicking those that workers would once have enjoyed in their homes. The changing workplace, far from residential areas and operating through multiple shifts to keep factories running all hours, transformed not just eating venues but offerings as well. Quick lunches from street vendors and lunch wagons (and later from lunch rooms and diners) demanded simpler foods like hotdogs and hamburgers that turned hot meat dishes into hand-held sandwiches. For breakfast, fried eggs, bacon, and pancakes could be easily prepared on the same grills as the lunchtime hamburgers.

New equipment and food processing methods—some originating as early as the 1890s, but many not widely adopted until the 1920s and 1930s—also contributed to the efficiency and appeal of restaurants. Homogenized milk, sliced bread, milk bottles, coffee percolators, bottle caps, refrigerators, automatic toasters, electric mixers, griddles, waffle irons, hotdog steamers, deep-fat fryers, slicing machines, stainless steel tableware/cookware, dishwashers, conveyor belts (to move dirty dishes to the dishwashers), the jukebox, Formica counters, and air conditioning all contributed to the ease of preparing and serving meals quickly and to the comfort and appeal of the new eating places.

The Changing Eating Culture

As the share of women in the national workforce rose from 15 percent in 1870 to 22 percent by 1930 (Jakle and Sculle, 1999, p. 95), urban eating options expanded to compensate for meals once eaten in homes where women were no longer available to cook. Luncheonettes and diners also expanded their

menus and improved their ambiance to appeal to women workers. At the same time, commercial eating places added booths and table service to accommodate children, and devised entertaining themes and children's menus to capture the rising disposable incomes that made family meals out a more common occurrence. Diners, luncheonettes, soda fountains, drive-ins, and other casual quick-serve restaurants became popular venues for meeting friends, dining with family, and celebrating events.

Despite the rapid development of restaurants in the late 19th to early 20th centuries, they remained a small part of the American eating landscape, mostly clustered in the business centers of industrialized cities. Then beginning in the 1930s and increasingly rapidly in the post-World War II years, the automobile became an integral part of American life. In the 1930s, 26 million automobiles and thousands of miles of new road enabled whole populations to be more footloose in search of work, community, and adventure. And all of these travelers needed to eat.

Roadside restaurants of various shapes and sizes and differing widely in quality and sophistication—many associated with gasoline filling stations and overnight lodging—grew up to meet the need for mobile dining. While many of the longlasting restaurant and fast-food chains began or expanded because of their roadside locations, most roadside restaurants (at least through the 1970s) remained individually owned or part of small, relatively local chains and served a wide range of foods, including breakfast; snacks like donuts and ice cream; sandwiches, including burgers and hotdogs; and ethnic/regional specialties.

Still, the expansion in numbers of restaurants in the latter half of the 20th century owed a great deal to the rise of chain restaurants—not just several restaurants with a single owner, which had been relatively common since the late 19th century, but restaurants linked by duplication of structure, theme, food, service, and amenities. Centralized sourcing of supplies, some food preparation, and building design streamlined management tasks and reduced costs, while controlling food processes to ensure a predictable quality of food and experience for customers (i.e., branding). As a result, entrepreneurs could expand their successful restaurant formats to regional and even national scale.

Chain restaurants, like so many other restaurant types, had their origins in the industrial changes of the 19th century. The Harvey House, a chain developed in towns along the Santa Fe railroad in the Southwest, was an early version of the travel-oriented chain restaurant. They became an icon of clean dining rooms, good food, and reliable service. Fred Harvey established—through practices like careful menu control, high-quality food (by travel standards), and spotless dining rooms—the foundations used by later restaurant chains like Howard Johnson's that traded on a perception of cleanliness, predictable food, and family friendliness.

The Rise of National Franchise Chain Restaurants

In the 1920s and 1930s, some of the most famous chain restaurants—Horn & Hardarts, Howard Johnson's, A&W Root Beer, Bob's Big Boy, Dairy Queen, White Castle, and Marriott Hot Shoppes among them—appeared in urban areas as walk-up lunch rooms, cafeterias, and hamburger stands. The earliest of these chains focused on urban working populations. However, as suburban expansion and leisure road travel began to increase around midcentury, most chains altered their designs to accommodate parking and drive-in services. New chains appeared specifically to lure automobile-based customers. And as chains moved into suburban settings, the notion of eating out for *fun* rather than as a worktime concession gained traction, fully exploiting the potential for increased sales that could come from turning eating out into entertainment.

The expansion in the 1950s of chains—spurred by the franchise model developed by Howard Johnson in the 1930s and used so successfully by McDonald's, Kentucky Fried Chicken, Domino's, Long John Silver's, Burger King, and Sonic, among others—established the familiar national landscape of easy-access, low-cost, quickly served, and predictable food. The franchise model was a variation on the earlier centralized chain system that solved the problem of effective central management across widely dispersed locations. Individual owners were licensed to operate local restaurants using the chain's common building design, food, and delivery theme under contracts that specified quality and consistency. Franchises facilitated operation at the larger regional and national scale made profitable by the increased mobility afforded by the automobile.[10]

The network of restaurants across the United States grew slowly into the 1960s, from 127,000 restaurants in 1954 to 135,000 in 1967, and then rapidly increased by more than 100 percent by the mid-1980s (Pillsbury, 1990, p. 103). Fast-food restaurants accounted for 40 percent of U.S. restaurants by 1983, and Americans ate out an average of 3-4 times a week, spending 40 percent of their food budgets on eating out (Mariani, 1991, p. 174). Breakfast food chains like IHOP, Perkins, Waffle House, and Dunkin' Donuts began to proliferate in the 1960s, first serving commuters and shift workers traveling to and from work but, like other chain restaurants, quickly adding families and teenagers in search of leisure activities. The addition of breakfast sandwiches at traditional lunch fast-food chains like Hardee's and McDonald's in the 1980s and at coffee chains like Starbucks in the 1990s added breakfast to the list of meals regularly eaten out.

Conclusion

Changes in the geography of work, the structure of the family, the availability of disposable income and leisure time, and personal mobility offered by cars and good roads have combined to alter what and where we eat. These kinds of developments will continue to affect our eating preferences, and the future will certainly bring more changes. Some new trends, such as internet ordering of fresh prepared meals for home delivery, rekindle older eating patterns like family meals at home. Just as surely, however, new forms of personal transportation, new techniques and technologies for food preparation, and new cuisines will take us in different directions, creating innovative ways to combine work, leisure, and eating.

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[10]See especially Jakle and Sculle, pp. 69-73, for a discussion of the rise of franchising in the restaurant industry.

Chapter 3: A Retrospective of Food-Away-From-Home Expenditures From 1987 to 2017

This chapter examines macroeconomic trends in food-away-from-home expenditures (FAFH) by outlet type (e.g., full- and limited-service restaurants, hotels and motels, grocery stores, and schools and colleges) using the Food Expenditure Series and relates the observed trends to the economics literature on FAFH. Between 1987 and 2017, FAFH steadily grew as a percentage of total food expenditures, exceeding food at-home (FAH) expenditures for the first time in 2010. Of the three recessions that occurred during the past three decades, only the Great Recession appears to have induced a temporary reduction in FAFH expenditures (December 2007 to June 2009).

In 2017, Americans spent $13,395.5 billion on personal consumption expenditures (PCE).[11] Food expenditures were the third highest aggregate spending category of the U.S. economy, surpassed only by housing and transportation expenditures (Kuhns, 2018). Of this total, housing comprised 33.3 percent, transportation was 17.0 percent, and food accounted for 12.6 percent (Kuhns, 2018). Changes in aggregate food spending are largely attributable to major economic and demographic developments (Stewart et al., 2004). The previous chapter gives a historical account of the evolution of FAFH. As a complement, this chapter provides an overview of broad trends in U.S. food-away-from-home (FAFH) expenditures during the 30-year period from 1987 through 2017. Because there is some variation in the way FAFH is defined, the chapter begins with an overview of the Food Expenditure Series, the basis of this chapter's analysis. The second section explores general trends in FAFH expenditure patterns by outlet type and purchaser and their relationship to personal disposable income. The last section discusses how various economic and demographic factors may drive observed FAFH expenditure patterns, including an assessment of the effect of recessions.

USDA's Food Expenditure Series

The Food Expenditure Series is an annual time series that estimates the value of all food acquired in the United States, including total household food sales, and the cost of food provided to institutionalized populations (e.g., inpatients at hospitals and nursing homes) (Manchester and King, 1979; Manchester, 1987; Manchester, 1990; Okrent et al., 2018). The Food Expenditure Series allocates the value of food acquired into FAH and FAFH categories. FAH expenditures include sales of food for off-premise consumption from grocery stores; other retail stores (e.g., warehouse/wholesale clubs and supercenters, gas stations and convenience stores, and department stores); home delivery and mail order; direct sales by farmers, manufacturers, and wholesalers; and donations and home production. FAFH expenditures comprise sales of food for on-premise consumption from eating and drinking places, hotels and motels, retail stores and direct-sales establishments, recreational places, schools and colleges, and other places (such as military exchanges and institutions such as hospitals and prisons). For example, a deli sandwich purchased at a grocery store would be classified as an FAFH expenditure because such foods are typically consumed on the premises of the store.

The Food Expenditure Series further allocates FAFH by outlet type, including sources that are not primarily engaged in selling meals and snacks, such as hotels and motels, retail stores and direct-

[11]PCE measures consumer spending on goods and services in the U.S. economy and gives an indication of how much household income is allocated for current spending versus saved for future consumption.

sales venues; recreational sites; schools and colleges; military exchanges; railroad dining cars; institutions (e.g., prisons, group homes); and supplies to military forces. Eating places include full-service and limited-service restaurants. Full-service restaurants have wait staff to take orders and deliver food, whereas food is ordered at a counter at limited-service restaurants.

The Food Expenditure Series also breaks down FAH and FAFH expenditures by purchaser type, i.e., families and individuals, Government, and businesses. FAFH purchased by families and individuals includes expenditures for meals and snacks purchased by or provided to them as part of employment or another service (e.g., inpatient meals at hospitals). FAFH purchased by Government includes foods donated to schools and meals provided to incarcerated individuals and the military. FAFH purchased by businesses includes expense account meals. Expenditures by families and individuals are expressed as a percent of disposable personal income (DPI).

The Food Expenditure Series was recently revised to incorporate improved data and methods, and its data begin in 1997. The comprehensive revision resulted in major revisions to the magnitude of the Food Expenditure Series. Because of the extent of the changes, the comprehensive revision establishes a break with the previously published Food Expenditure Series, the data of which began in the 1800s. However, the revised FAH and FAFH estimates and the previously published estimates mostly grew at the same rate from year to year (Okrent et al., 2018). To provide a longer historical perspective in this chapter, we use the rate of change in the previously published Food Expenditure series to pull the revised 1997 estimates back to 1987.

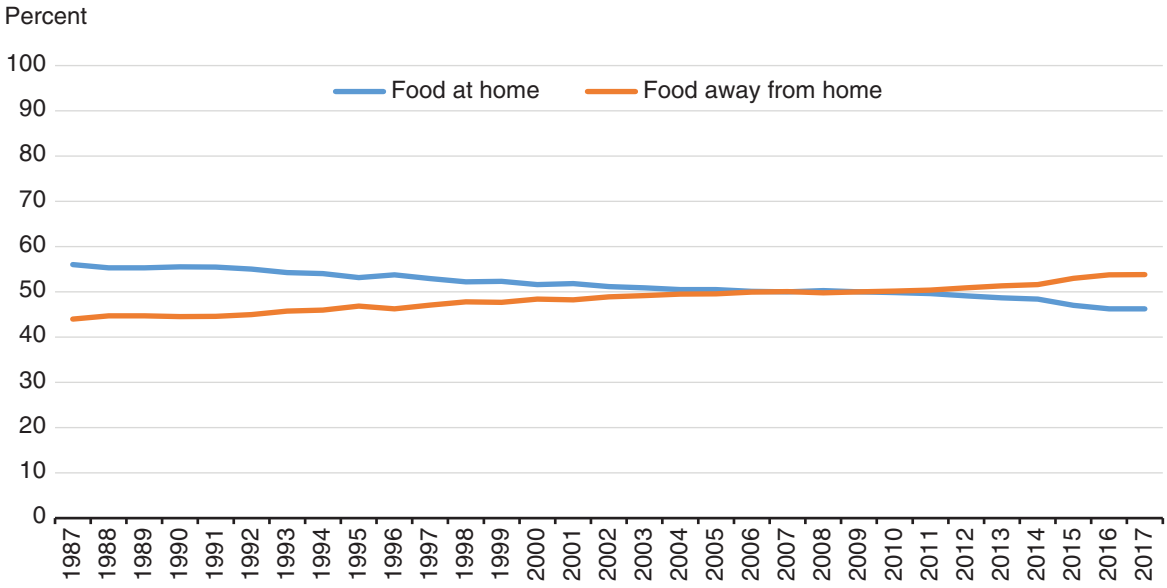
FAFH Over Time

FAFH expenditures rose steadily between 1987 and 2017, with a concurrent decline in the share of FAH spending. In 2007, the FAFH and FAH shares of total food expenditures were approximately equivalent, but in 2008-09, the FAFH share dipped below 50 percent. By 2010, the FAFH market share surpassed the FAH market for the first time (fig. 3.1). FAFH expenditures totaled $616.4 billion in 2010, about 50.2 percent of total U.S. food spending for that year, equal to $332.0 billion in 1988 dollars (fig. 3.2).

Food sales at restaurants, including full- and limited-service restaurants, accounted for 71.9 percent of FAFH expenditures in 2017; in 1987, their combined share stood at 66.6 percent (fig. 3.3). During the past 30 years, full-service restaurants consistently comprised the larger share of FAFH expenditures, rising from 34.0 to 35.8 percent. Meanwhile, the limited-service eating place share increased from 32.6 percent of FAFH expenditures in 1987 to 36.1 percent in 2017. Spending at full- and limited-service restaurants has consistently risen in a parallel manner, except for a brief period during the 1990s (fig. 3.4). Limited-service restaurant sales rose at a faster rate during this interval, briefly surpassing the market share of full-service restaurants in 1995 before full-service restaurants regained their dominance the following year.

Figure 3.1

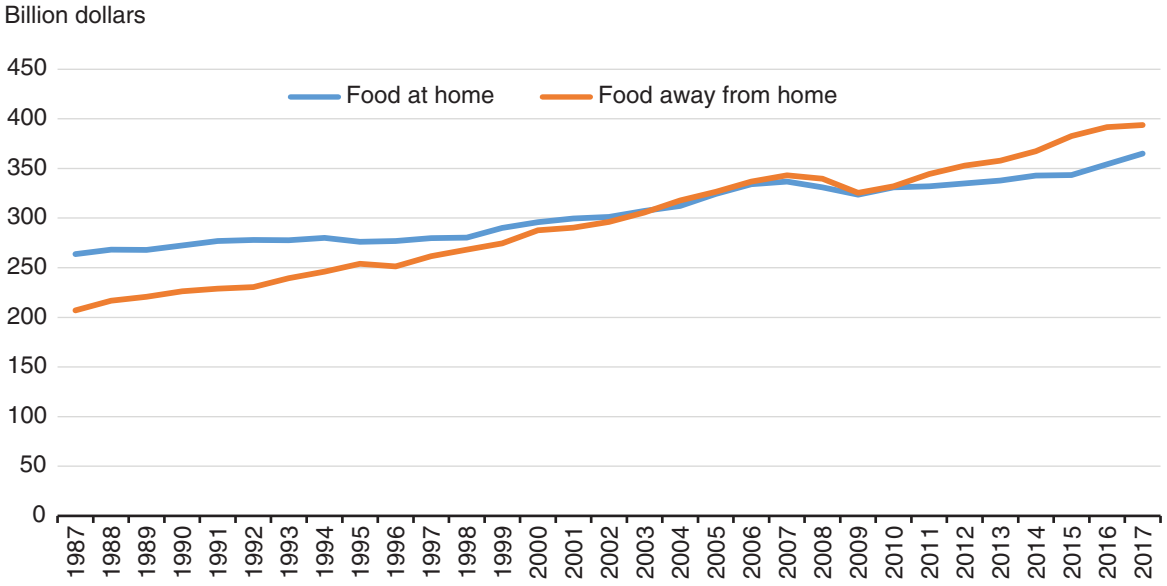
Relative shares of the two major food markets, 1987-2017



Source: USDA, Economic Research Service Food Expenditure Series.

Figure 3.2

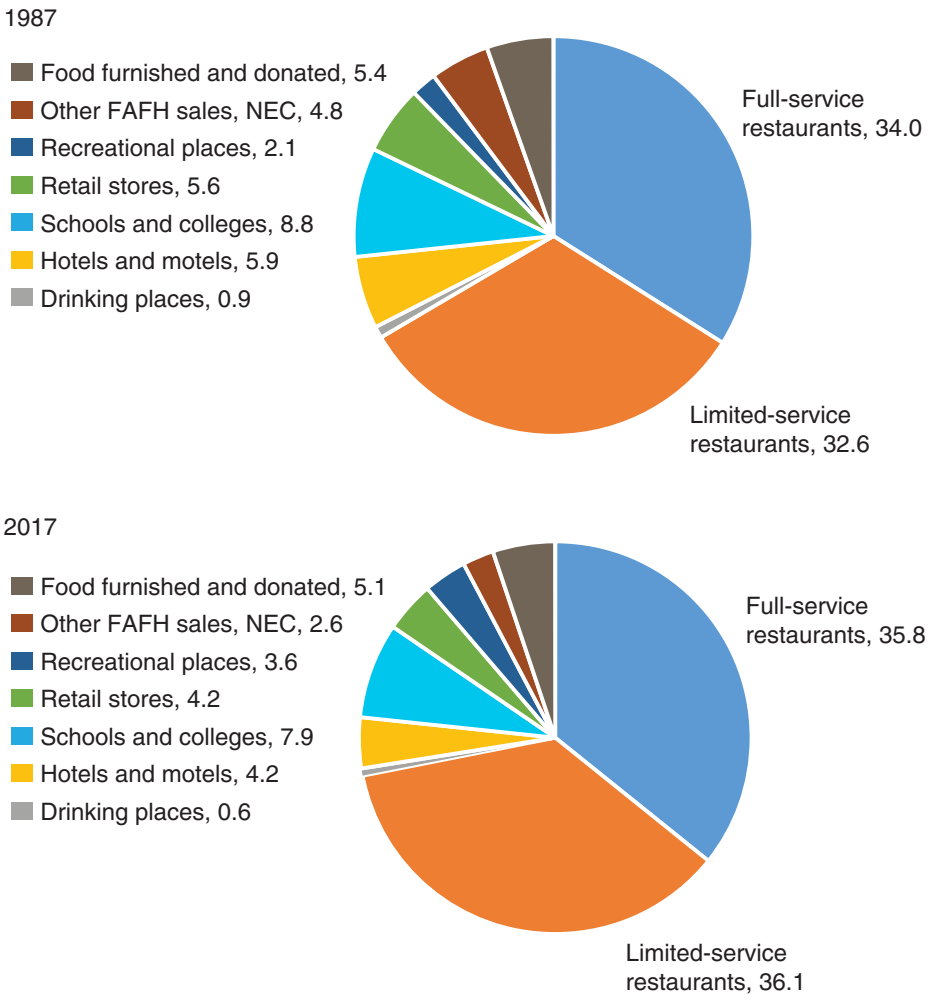
Constant-dollar food expenditures, 1987-2017 (1988 = 100)



Source: USDA, Economic Research Service Food Expenditure Series.

Figure 3.3

Share of FAFH expenditures by outlet type, 1987 and 2017 (percent)

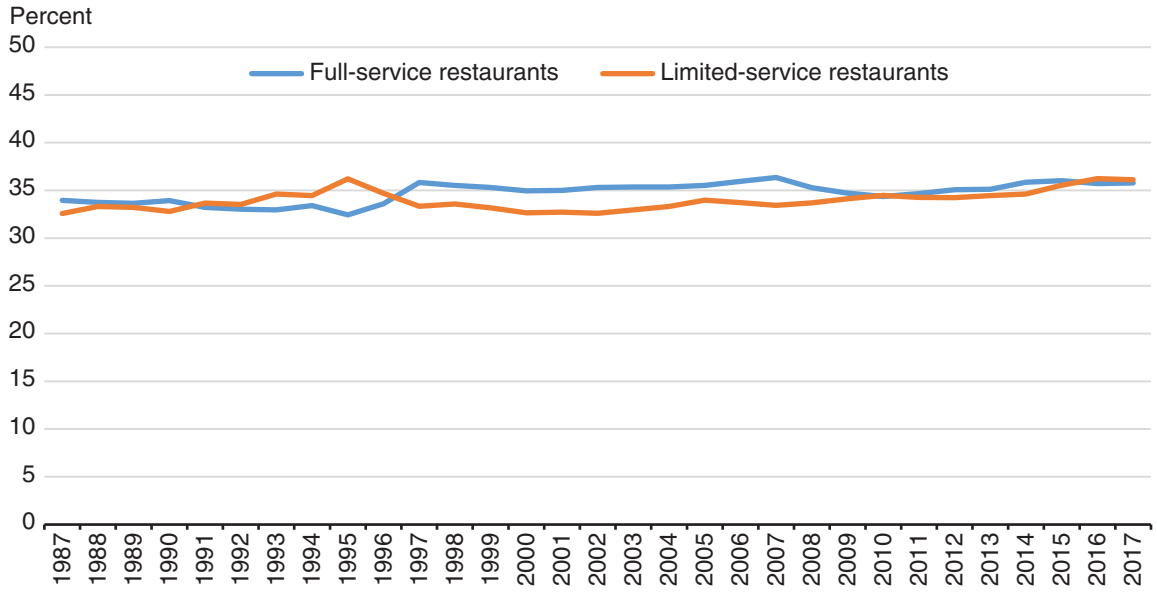


Notes: FAFH = food away from home. NEC = not elsewhere classified. Estimates include sales taxes and tips.
Source: USDA, Economic Research Service Food Expenditure Series.

While restaurants are the largest source of FAFH, Americans can purchase foods at sporting events, recreational places, hotels and motels, and schools and colleges, as well as from retail stores and vending machines. These outlets are similar to their foodservice counterparts in terms of the foods being offered and their nutritional composition. However, foodservice at these outlets is a secondary activity that could reflect either a demand for food itself or a demand for eating as a complement to the primary activity, or both. The only other sector whose share of the total FAFH rose during the 1987-2017 period was recreational places (which include movie theaters, sports, and other entertainment venues), going from 2.1 percent of the nominal FAFH in 1987 to 3.6 percent in 2017. The expenditures for the other types of FAFH—hotels and motels, schools and colleges, retail stores, and vending machines—declined as a share of FAFH between 1987 and 2017. The relative shares of spending between FAFH and FAH are also reflected in the proportion of expenditures as a percent of DPI; the DPI share of FAH expenditures has steadily declined, while FAFH spending has held steady.

Figure 3.4

Percent of FAFH sales at full- and limited-service restaurants, 1987-2017



Notes: FAFH = food away from home. Estimates include sales taxes and tips.
Source: USDA, Economic Research Service Food Expenditure Series.

Three major recessions occurred during the period covered by this chapter. Of these, food expenditure patterns were different during only the Great Recession, when Americans of all income levels reduced food spending by eating out less (Kumcu and Kaufman, 2011; see chapter 4). According to the Food Expenditure series, this reduction was reflected in decreased FAFH spending from $601.6 billion in 2008 to $596.7 billion in 2009, a decrease of 0.8 percent. Reduced FAFH spending was especially pronounced at full-service restaurants and was largely responsible for decreased aggregate FAFH spending during the Great Recession. Spending at limited-service restaurants actually increased at a slower rate during the recession. Between 2004 and 2006, food spending at these restaurants grew an average of about 7.3 percent; between 2007 and 2009, it grew an average of 3.1 percent; and between 2010 and 2017, it grew an average of 5.6 percent

Expenditures on FAFH did not decrease during the other two economic downturns that occurred in this 30-year period, and there was little change in the relative shares of the aggregate FAH and FAFH markets. Similarly, there was little change among the relative market shares of the various outlets comprising the FAFH market. There were pronounced slowdowns in the rate of increase in FAFH expenditures within a year of the onset of the recessions in the 1990s and early 2000s although expenditures on FAH also rose at a slower pace during this period. For example, nominal FAFH spending continued to increase in the wake of the 1990-91 recession; however, this rate of increase slowed from 7.2 percent in 1990 to 4.6 percent in 1991 and 2.8 percent by 1992. In 1993, FAFH spending picked up again, increasing 5.7 percent.

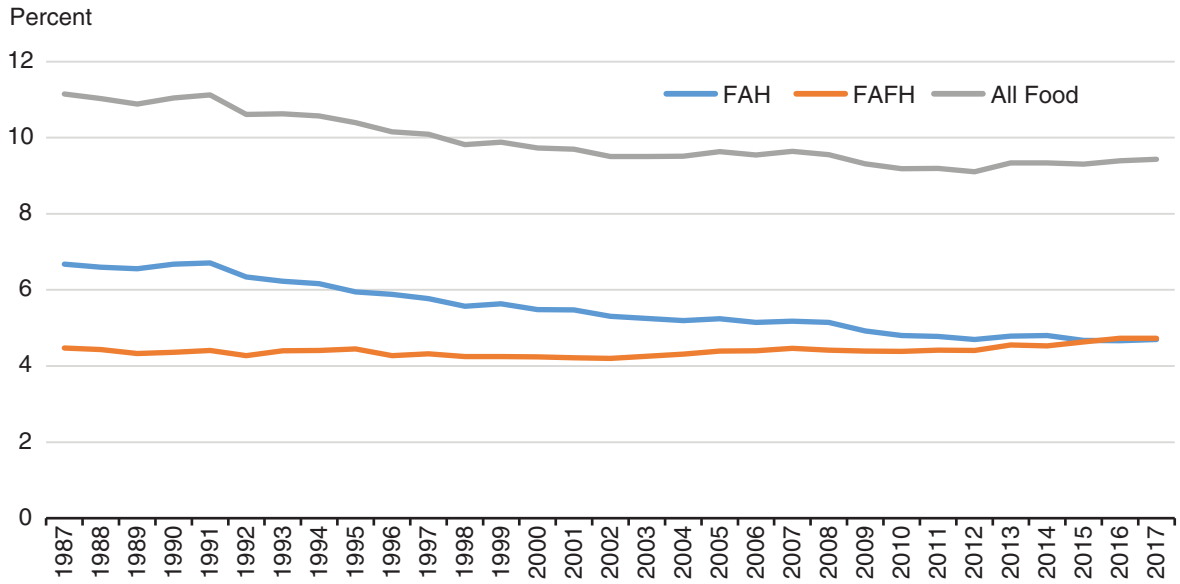
The 2001 recession lasted 8 months (as did the 1990-91 recession), but unemployment rose less during this period than during the Great Recession. The milder impacts of the 2001 recession resulted in smaller changes to food expenditures compared to the other recessions. FAFH spending rose, but at a smaller pace, increasing just 3.8 percent in 2001 and 4.5 percent the following year, while FAH spending increased 4.6 and 1.8 percent, respectively. However, FAFH expenditures rose

4.5 percent in 2003, surging 7 percent by 2004. These increases reflected renewed consumer confidence and a faster rate of increase in disposable income.

According to the Food Expenditure series, between 1987 and 2017, the share of disposable personal income spent on total food by American households fell from 11.2 to 9.4 percent, as the share of income spent on FAH fell (fig. 3.5). This result is consistent with Engel's law, an empirical observation that as income increases the share of income spent on food declines even if actual expenditure on food rises. This decline is largely driven by the share of income spent on food purchased in grocery stores and other retailers declining from 6.7 percent to 4.7 percent during this period. At the same time, the Food Expenditure data show that the percent of income spent on food purchased at restaurants and other away-from-home eating places increased slightly, from 4.5 to 4.7 percent. By 2016 and 2017, the share of disposable personal income for FAH and FAFH was equivalent, at 4.7 percent.

Figure 3.5

Household food expenditures as a percent of personal disposable income, 1987-2017



Notes: FAFH = food away from home. Estimates include sales taxes and tips.
Source: USDA, Economic Research Service Food Expenditure Series.

Factors Affecting Spending on FAFH

The trends above can be explained by looking at economic determinants of FAFH. Consumers choose food based on affordability (how much income they have and how much the food costs), time constraints, and their tastes and preferences. Income is an important determinant of food choices, FAFH in particular. While the proportion of the budget spent of food generally falls as income increases (as described above), the composition of the food basket also changes.

It has been observed that the consumption of starchy, staple foods declines with income (Bennet's law). Staple foods are examples of necessities where consumption of the food increases less than proportionally with increases in income. Conversely, foods whose consumption increases more than proportionally with income are called luxuries. In other words, FAFH is income-responsive to the extent that a 1-percentage point increase in income generates a more than 1-percentage-point

increase in demand for FAFH. While the consumption of necessities increases less than proportionally with income, the consumption of luxuries must increase. Kamakura and Du (2012) found that Engel curves for FAH were downward sloping while Engel curves for FAFH were upward sloping. These results imply that income increases the expenditure allocated to FAFH at more than a proportional rate. In addition, demand for FAFH tends to be more responsive to income changes than demand for FAH (Seale et al., 2003; Okrent and Alston, 2012; Okrent and Kumcu, 2016). Between 1987 and 2017, DPI generally increased (except during economic downturns). This trend has likely contributed to observed declines in the share of DPI allocated to food, along with increases in the share of DPI allocated to FAFH.

Relative price movements are also an important determinant of food choices. If prices of FAH grow at a faster rate than FAFH, then consumers have an incentive to subsitute FAFH for FAH. Between 1987 and 2017, price increases of FAFH outpaced those of FAH, with average annual FAH and FAFH price growth of 2.6 and 2.8 percent, respectively. However, price growth varied across outlet types. Okrent and Kumcu (2016) found that prices at full-service restaurants generally held pace with limited-service restaurants until 2005 but that limited-service restaurants began to outpace full-service restaurants thereafter. The price effect generally causes the quantity of FAFH demanded to decline, depending on the degree of price elasticity and the extent to which FAH serves as a substitute for FAFH. Previous studies have modeled demand for FAFH as a composite good and have generally found demand for FAFH to be more responsive to price changes than FAH (see Okrent and Alston (2012) for a review of these studies). Okrent and Alston found demand for limited-service restaurants to be almost perfectly inelastic to changes in prices (-0.13) and demand for meals from full-service restaurants to be quite price elastic (-1.96). Okrent and Kumcu also found demand for limited-service meals and snacks to be relatively more inelastic than both full-service and FAH food. Richards and Mancino (2013) found the price elasticity of demand for meals at limited-service restaurants and various types of full-service restaurants to be between -0.5 and -0.9. Given the observed growth in FAFH spending over the period, it is likely that the positive income effect has dominated any negative price effect.

Interestingly, Gicheva et al. (2007) show that American consumers reallocate their expenditures across and within food-consumption categories in order to offset necessary increases in gasoline expenditures when gasoline prices rise. In particular, gasoline expenditures rise one-for-one with gasoline prices, and consumers substitute away from FAFH and towards FAH in order to partially offset their increased expenditures on fuel. Within FAH, consumers substitute away from regular shelf-price products and toward promotional items in order to save money on overall grocery expenditures. On average, consumers are able to decrease the net price paid per grocery item by 5 to 11 percent in response to a 100-percent increase in gasoline prices.

Households not only consider affordability when making food choices, but also the time it would take to prepare the foods. If the primary meal planner in the household gets a job, then that person's time becomes more valuable. Time-intensive meal preparation thus becomes less attractive and motivates increased consumption of away-from-home prepared meals. Over the past several decades, increases in women's education and labor-force participation may have led to less time spent cooking and higher FAFH expenditures. Many studies have found that the value of time for a household manager (sometimes assumed to be the woman) positively affects demand for total FAFH (Prochaska and Schrimper, 1973; Sexauer, 1979; Soberon-Ferrer and Dardis, 1991; Yen, 1993; Nayga and Capps, 1994; Byrne, Capps, and Saha, 1996; Dong et al., 2000). However, a few studies, namely Huffman (2011), Redman (1980), and Kinsey (1983), found the household time constraint

to be a less important determinant of demand for FAFH. Kinsey (1983) argued that while this may appear to contradict theory, in fact, household managers need not increase FAFH expenditures in order to substitute relatively inexpensive goods and services for time if the cost of purchasing certain types of FAFH (i.e., limited-service meals) is cheaper than conventional full-service restaurants.

A handful of studies investigate whether the value of time has a differential effect on FAFH by establishment and meal type. McCracken and Brandt (1987) and Stewart et al. (2004) found that an increased value of the household meal planner's time resulted in higher expenditures on meals at limited-service restaurants more than on meals from full-service restaurants. Similarly, Byrne et al. (1998) and Stewart and Yen (2004) found the effect of household manager hours to have a positive impact on demand for foods from limited-service restaurants but to be negative for full-service foods. Contrary to previous findings, Jekanowski et al. (2001) did not find any significant effect of this variable on per capita fast-food sales. Jensen and Yen (1996) examined the demand for FAFH by meal type—breakfast, lunch, and dinner—and found that the effects of a wife's employment are positive on both the probability and level of expenditures on lunch and dinner in the FAFH market, but did not seem to affect breakfast consumed as FAFH.

Household size may also impact FAFH expenditures. The average size of the American household has shrunk from 2.7 members in 1984 to 2.5 members in 2014 (Current Population Survey, U.S. Census). Additionally, chapter 4 shows notable differences in food spending patterns across households of different sizes. As a household adds more members, FAH may become more economical for several reasons. First, food preparation time per person increases as household size decreases. For example, it might take 20 minutes to prepare a meal for one person at home, but just 30 minutes to prepare a meal for four people. Second, as household size increases, food preparation and clean up can be delegated across more people. Third, the household with more members can also benefit by purchasing larger package sizes with lower per unit costs. Byrne et al. (1996) found household size had a negative effect on demand for total FAFH, arguing that there are economies of scale in household size in food production at home. However, Byrne et al. (1998) found that family size was only negatively related to expenditures at full-service restaurants and positively related to expenditures at fast-food restaurants. On the flip side, some argue that single-person households may demand less food away from home. For example, they may demand less food from full-service restaurants because they do not want to eat alone away from home. Prochaska and Schrimper (1973) and Soberon-Ferrer and Dardis (1991) found that even though the presence of children in the household negatively affected demand for total FAFH, the size of the household increased demand for total FAFH. They argue that the additional number of adults in the household leads to additional FAFH purchases because of employment and social activities.

Studies have also investigated changes to household structure where American households used to be primarily headed by married partners and have transitioned more to single and multi-generational households (Hamrick and Okrent, 2014). Byrne et al. (1998) found that unmarried households spent less on FAFH than married households regardless of restaurant type, arguing that a fewer number of people were involved in the FAFH occasion. Contrary to this result, Stewart and Yen (2004) and Stewart et al. (2004) found that single-person households spent around $0.50–$3.00 more per week at fast-food and full-service restaurants compared to married households. On the other hand, single-parent households spent $0.83 less than married households with children at both types of FAFH establishments. The gender of the household manager also seems to play an important role on demand for FAFH. However, the dominance of one gender over the other is uncertain, based on the literature. For example, Byrne et al. (1996) found that female household managers spent less

than male household managers on FAFH, which they attributed to males having less culinary skill. This result is contrary to that of Dong et al. (2000), who found that female household heads tended to purchase more FAFH meals than male household heads, while single households had no effect on the number of FAFH meals. By establishment type, Byrne et al. (1998) found that female household managers who worked outside the home spent less at upscale and midscale full-service restaurants, but more at fast-food restaurants, than male household managers.[12]

Differences in dining-out preferences across generations may also be important determinants of FAFH consumption. In the past, people often spent less away from home as they became older (see the chapter 4 for more details about the impact of the elderly on FAFH and FAH consumption patterns). It remains to be seen whether this pattern will hold true for Baby Boomers (people born between 1946 and 1964). Further, the greater tendency of Millennials—defined as people born after 1980 (Pew Research Center, 2015) – to eat away from home could explain recent increases in the FAFH share of total food expenditures. Indeed, Consumer Expenditure Survey data from 2015 show that Millennials had the highest FAFH expenditure share, at 47.0. This share drops with older generations. For example, Baby Boomers had a share of 40. 6 percent. The Greatest Generation (born before 1928) had the smallest share at 30.3 percent. By contrast, the share of FAH expenditures was greater for each generation. Millennials had the smallest FAH share at 53.0 percent, while the Greatest Generation had the largest at 69.7 percent. Over time, this may change as Millennials get older, when their preferences may become more similar to current Greatest Generation individuals.

Business cycles can enhance or diminish the impact of the various factors, just discussed, that influence changes in the level of consumer food expenditures. First, higher unemployment levels during the Great Recession permitted more time for food preparation such that households substituted away from FAFH (Nevo and Wong, 2015; Todd and Morrison, 2014; see Chapters 4 and 7). Second, relatively higher aggregate FAFH prices incentivized people to eat at home more, thereby influencing expenditure levels in these markets during the recession (Todd and Morrison, 2014). Third, demand for FAFH tends to be more responsive to income changes than demand for FAH (Okrent and Alston, 2012). Hence, compared to FAH, FAFH was more responsive to the 5.3-percent decline in disposable income from 2008 to 2009, and it is likely that, if FAFH is a luxury, the income effect would be amplified. Finally, consumer confidence was very low during the Great Recession and reached its lowest recorded level in 2008 (De Nardi et al., 2012). Consumer expectations provide information about potential future changes in consumer spending and serve as a leading indicator for the aggregate economy. These expectations can affect consumer preferences, and hence expenditure allocations between the FAH and FAFH sectors.

Advertising likely plays a role in household food sourcing. Advertising expenditures for meals and beverages offered by quick-service and full-service restaurants are substantial, with some of the top advertisers in the country being McDonald's, Yum Brands and Darden Restaurants. There is also some promotion of commodities commonly consumed at home, such as milk, some fruits, and beef and pork, as well as ready-to-cook and ready-to eat products like Campbell's and Hershey's. However, the promotion of foods for at-home consumption pales in comparison to that for FAFH (Okrent and Kumcu, 2016). Some studies have found demand for quick-service foods to be quite responsive to advertising. Andreyeva, Kelly, and Harris (2011) found a significant effect of fast-food advertising on body weight for overweight and obese (body mass index or BMI ≥ 85th percentile)

[12]Byrne et al, (1998) define upscale restaurants as offering full alcohol service and accepting credit card whereas midscale restaurants do not.

children. Grossman, Tekin, and Wada (2012) found that banning television advertisements for fast food would reduce youth BMI by 2 percent and youth body fat by 3 percent.

The extent to which increased U.S. racial and ethnic diversity affects FAFH expenditures remains to be seen. Many studies find significant differences in eating patterns based on race, including studies focusing on FAFH (see chapters 4 and 5, as well as Hamrick and Okrent, 2014, Byrne et al., 1998, and Stewart et al., 2004, to name a few). Typically, these findings are attributed to differences in tastes and preferences across ethnic groups. The diversity of ethnic restaurants, which grew during the past 15 to 20 years, may reflect both increased population diversity and increased demand for ethnic foods.

Conclusion

FAFH expenditures steadily grew as a percentage of total food expenditures between 1987 and 2017, and they exceeded FAH expenditures for the first time in 2010. However, these expenditures have remained fairly steady as a percent of disposable personal income (DPI). In contrast, this ratio has declined for the FAH market. Total food expenditures have also declined as a percent of DPI.

Three recessions have occurred during the last three decades, and of these, only the Great Recession appears to have induced lower FAFH expenditures. However, it should be noted that two of these recessions lasted two-thirds of a year, while the Great Recession had a duration of 18 months. Limited-service restaurants have gained the most share of the various FAFH outlets during this period, but full-service restaurants still account for the highest share of FAFH expenditures.

Many factors can explain observed changes in FAFH spending. Income is likely one of the most important, and the Food Expenditure series shows changes consistent with two empirical laws—Engel's Law and Bennett's Law. While the proportion of the budget spent on food generally falls as income increases (Engel's Law), foods such as FAFH that are considered luxuries will increase more than proportionally with income (Bennett's Law). Prices changes are important as well, but the cost of gasoline may be a more important factor in influencing FAFH spending than the cost of FAH. Household time constraints have also become an important factor affecting FAFH expenditures. Over the past several decades, increases in women's education and labor-force participation may have translated into less time cooking and higher FAFH expenditures. Changes to household composition and structure have also likely played a role in the upward trend in FAFH spending. Increased advertising for FAFH also may have played a major role. It is difficult to pinpoint any one factor as being the most important because there are currently insufficient data to allow for a simultaneous analysis of the various factors impacting FAFH expenditures.

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Chapter 4: Food Away From Home During the Great Recession

This chapter examines changes in food spending during and after the 2007-09 Great Recession using the Consumer Expenditure Survey from 2005 to 2014. Households decreased the share of total food expenditures allocated to FAFH, which had not returned to pre-recession levels by 2014. Households shifted some expenditures from FAFH to FAH during the Great Recession and through the recovery, increasing spending on edible and unprepared ingredients and decreasing spending on full-service restaurants.

Unlike prior economic downturns in the past 30 years, during the most recent recession, food expenditure patterns changed substantially as Americans spent less of their food budget on food away from home (FAFH) and more on food at home (FAH) (Kumcu and Kaufman, 2011). Known as the Great Recession, the most recent economic downturn lasted from December 2007 to June 2009 and was the most severe since the Great Depression.[13] Unemployment continued to rise during the initial recovery, with over 8 million people losing their jobs between December 2007 and February 2010—a 6-percent decline.[14] Labor market conditions were slow to improve thereafter. As a result, employment did not reach pre-recession levels until May 2014; mean and median household income remained below pre-recession levels in 2014.[15]

As the economy slowed and unemployment rose, many U.S. households experienced financial hardship and decreased consumption; the decline in aggregate spending was the most severe and persistent since World War II (De Nardi et al., 2012). Food spending was no different, falling 5 percent—from $726 billion in 2006 to $690 billion in 2009—largely due to an 11.5-percent decline in FAFH expenditures (Kumcu and Kaufman, 2011). This change was reflected in food consumption patterns as well, with daily calories from FAFH declining 20 percent (166 calories) among working-age adults between 2005 and 2010 (Todd, 2014). Nevertheless, the number of quick-service restaurants continued to grow during this period, while the number of full-service restaurants remained relatively constant (see chapter 6).[16]

Although economic downturns can have a negative effect on households by reducing their income, studies show mixed effects of downturns on work hours and health outcomes. While some studies find that reduced work hours during the recession led to healthier lifestyles, including an increase in physical activity and a decline in severe obesity (e.g., Ruhm, 2005), others find negative health effects, particularly among individuals who had unhealthy behaviors prior to the recession (e.g., Charles and DeCicca, 2008). Similarly, changes in food purchasing patterns during the Great Recession reflect changes in financial and time constraints faced by households. Nevo and Wong (2015) find that between 2008 and 2010, individuals went grocery shopping more often but spent less money by taking advantage of coupons and discounts. Using data from the American Time

[13]These are the dates set by the National Bureau of Economic Research, which is considered to determine the official dates of a recession based on various economic indicators.

[14]This percentage was calculated using Current Employment Statistics from the U.S. Department of Labor, Bureau of Labor Statistics. February 2010 was the cutoff date because this period marked the lowest employment level during the recession and recovery.

[15]The mean and median income were obtained from the Census Bureau's Current Population Survey.

[16]Quick-service restaurants typically offer counter service for ordering while full-service are sit-down restaurants with a wait-staff.

Use Survey, Aguiar et al. (2013) find that 30 percent of the foregone market work hours during the Great Recession were reallocated to nonmarket work—including food preparation.[17] However, other studies find that the recession did not have a significant effect on the amount of time spent cooking at home or eating away from home (Smith et al., 2014). Nevertheless, it remains unclear how households adjusted the types of food they purchased throughout the Great Recession and the prolonged recovery.

This chapter explores fluctuations in food expenditures during the Great Recession and the prolonged recovery, examining total food spending as well as spending on FAH and FAFH. In addition, the analysis breaks apart FAFH expenditures by level of service and FAH expenditures by level of preparation needed for consumption to gain insight into the factors affecting spending allocations. This chapter also examines average per capita expenditures among households separated by socioeconomic status and composition, which may affect how households adjusted their food spending patterns. These analyses provide insight on how households adjust their spending in response to changes to financial and time constraints during economic downturns, and the effect it may have on their diets. This information can be used by policymakers to help mitigate the possible health impacts of recessions.

Data

This study uses data from the 2005-2014 Consumer Expenditure Survey (CES) conducted by the Bureau of Labor Statistics (BLS).[18] The period covered by the survey begins nearly 3 years before the recession began and ends at the point for which we have most recent data available, and when employment also recovered to its pre-recession level. The CES is a diary survey sent to about 7,000 households each year. Participant households record all of their purchases for 2 consecutive 1-week periods, including Uniform Commercial Codes (UCC) of each product purchased. Nonfood purchases are removed, and food spending that is representative of a full calendar year is estimated using sampling weights and estimation adjustments provided by BLS.[19]

Reported expenditures in the CES are adjusted using the FAH and FAFH Consumer Price Index (CPI) from BLS to account for inflation and any fluctuations in food prices, such as the global spike of 2007-08.[20] All of the food expenditures in this chapter are reported in 2005 FAH and FAFH-dollars; total food expenditures are calculated by aggregating the deflated FAH and FAFH expenditures.[21] It is important to note that the CES data only provide information on the total amount spent

[17]Market work hours consist of any hours spent working at a job, including any time spent commuting to work and overtime. Nonmarket work hours consist of any time spent working to take care of a home (e.g., vacuuming), obtain goods (e.g., grocery shopping), and take care of other adults.

[18]This chapter's estimations of FAFH and FAH may differ from estimations in chapter 3 for two reasons. First, the ERS Food Expenditures series includes business expenditures. Second, unlike the ERS food expenditure survey, BLS classifies its data according to where the product was purchased. For example, carryout from a full-service restaurant would be considered "Lunch/Dinner at Full-Service," or FAFH.

[19]See BLS website for details.

[20]The 2007-08 spike in food prices has been attributed to increasing grain prices resulting from droughts as well as government policies and international demand.

[21]Although a few of the individual items have their own CPIs, most of the product categories in this analysis do not. Thus, the FAH CPI is used for all FAH categories, even though they may have had different price changes. For example, in 2008, the percentage change in the CPI for FAH was 6.4, although pork prices increased by only 2.3 percent, while egg prices increased by 14.0 percent.

by each household for each UCC code during the week; the data do not include any information on the prices of the products or the quantities purchased.

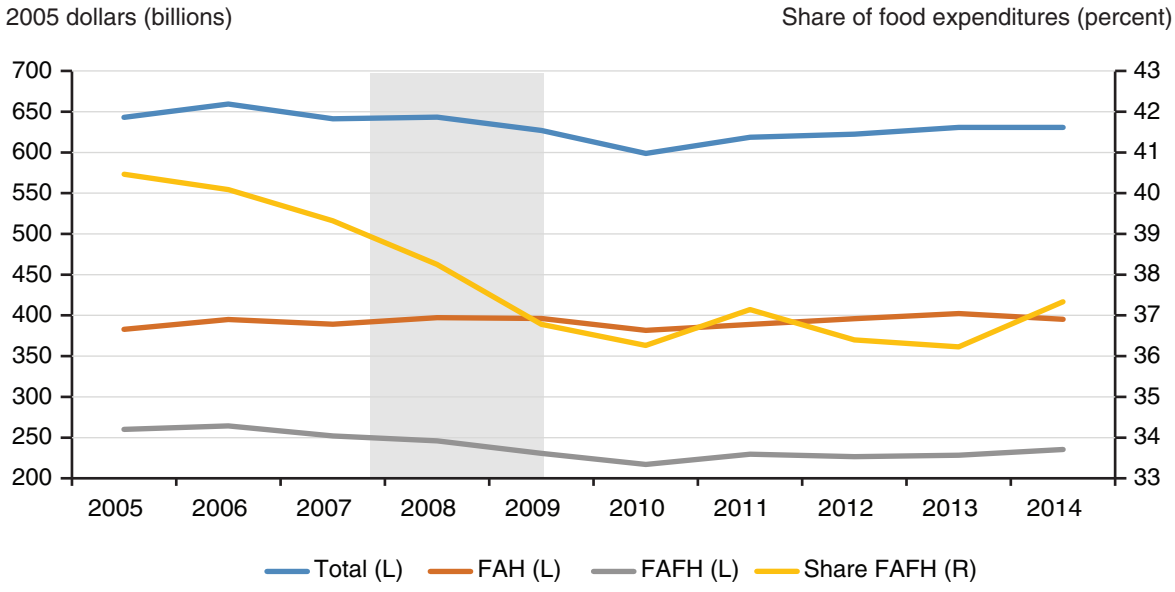
Total Food Expenditures for all Households

During the Great Recession, overall food spending declined and households allocated a greater share of their food budgets to FAH in place of FAFH. Total food expenditures adjusted for inflation fell 7 percent ($42 billion) between 2007 and 2010 (fig. 4.1).[22] This drop was primarily driven by the steady decline in spending on FAFH, which fell by 14 percent ($35 billion) during this period; its share of total food expenditures fell by 4 percentage points during this period. Although the Great Recession officially ended in June 2009, food expenditures did not begin to increase until 2010, coinciding with employment trends. The increase in FAFH spending was slower than the decline during the Great Recession, reflecting the slow labor market recovery. As a result, real (inflation-adjusted) food expenditures remained 2 percent ($13 billion) below pre-recession levels in 2014.

The large differences between total, FAH, and FAFH expenditures makes it difficult to examine their relative fluctuations. The percent change in spending levels, relative to 2005, shows the relative fluctuations more clearly, and statistically significant differences are noted with stars (fig. 4.2). Real spending on FAFH declined by 18 percent ($47 billion) from 2006 to 2010 and remained below its 2005 level through 2014. In contrast, FAH expenditures during 2005-14 exceeded their 2005 level in every year except 2010, reaching a peak in 2013 at 5 percent ($19 billion) above the initial level. These divergent trends suggest that households were replacing FAFH with FAH, or they were purchasing more groceries rather than eating out at restaurants.

Figure 4.1

Total food, food-at-home, and food-away-from-home expenditures, 2005-14

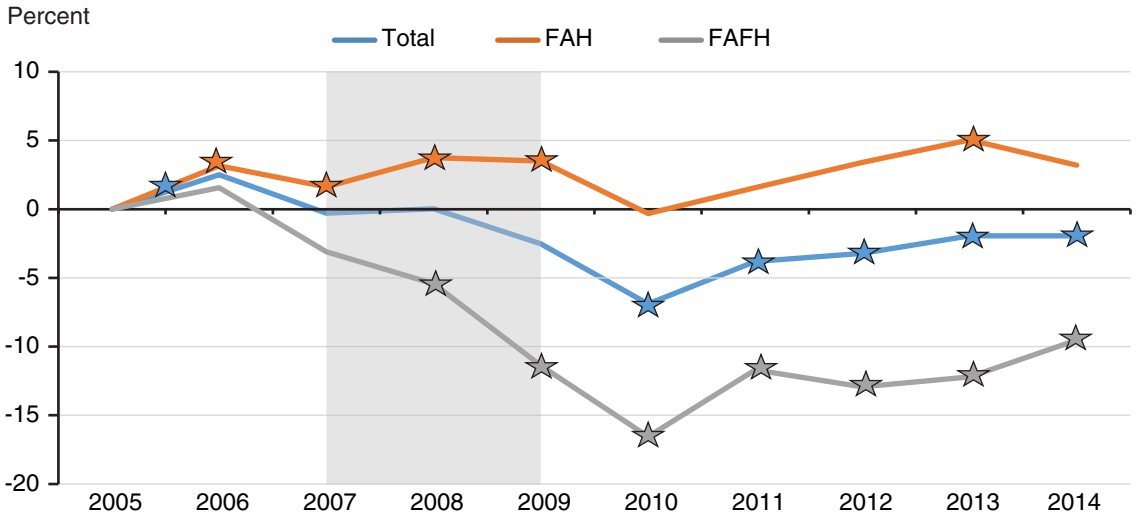


Note: Shaded area is recession. L = left axis. R = right axis.
Source: U.S. Department of Labor, Bureau of Labor Statistics Consumer Expenditure Survey.

[22]The dollar values are lower than those presented in Kumcu and Kaufman (2011) because we do not include alcoholic beverages.

Figure 4.2

Percentage change in total food, food-at-home, and food-away-from-home expenditures, 2005-14



Note: Shaded area is recession. The stars indicate that the expenditures are statistically different from 2005.
FAH = food-at-home. FAFH = food-away-from-home.
Source: U.S. Department of Labor, Bureau of Labor Statistics Consumer Expenditure Survey.

Total Food Expenditures by Category

Examining changes in aggregate FAH and FAFH expenditures provides a broad view of changes in household food spending in response to the Great Recession. However, there are a number of ways households could have adjusted their food spending within FAH and FAFH as well. For example, households could have reduced their FAFH expenditures by patronizing full-service restaurants less frequently but maintaining their spending at fast-food restaurants. Conversely, they could have increased their FAH spending by purchasing prepared foods and ready-to-heat meals or by cooking more meals with cheaper, raw ingredients, particularly if their leisure time had grown and they were financially constrained. Although the data limit analysis on whether households purchased fewer or cheaper items, the data do allow examination of changes in FAH expenditures according to preparation time and FAFH expenditures based on level of service.

FAH spending consists of six categories: prepared food; ready-to-heat food; edible ingredients; unprepared ingredients; nonalcoholic drinks; and other.[23] Similar to categories used in Okrent and Kumcu (2016), the first four categories used in this study are distinguished by the level of preparation required to consume the food.[24] Prepared foods are those that are eaten only in their current form, such as cake or prepared salads. Ready-to-heat foods, such as canned soup and frozen meals, only need to be heated. Edible ingredients are foods that may be eaten in their current form but that could also be used as ingredients in other dishes that require more preparation. These include

[23]There were a total of 139 UCC codes. See appendix to see which UCC codes are included in each category.

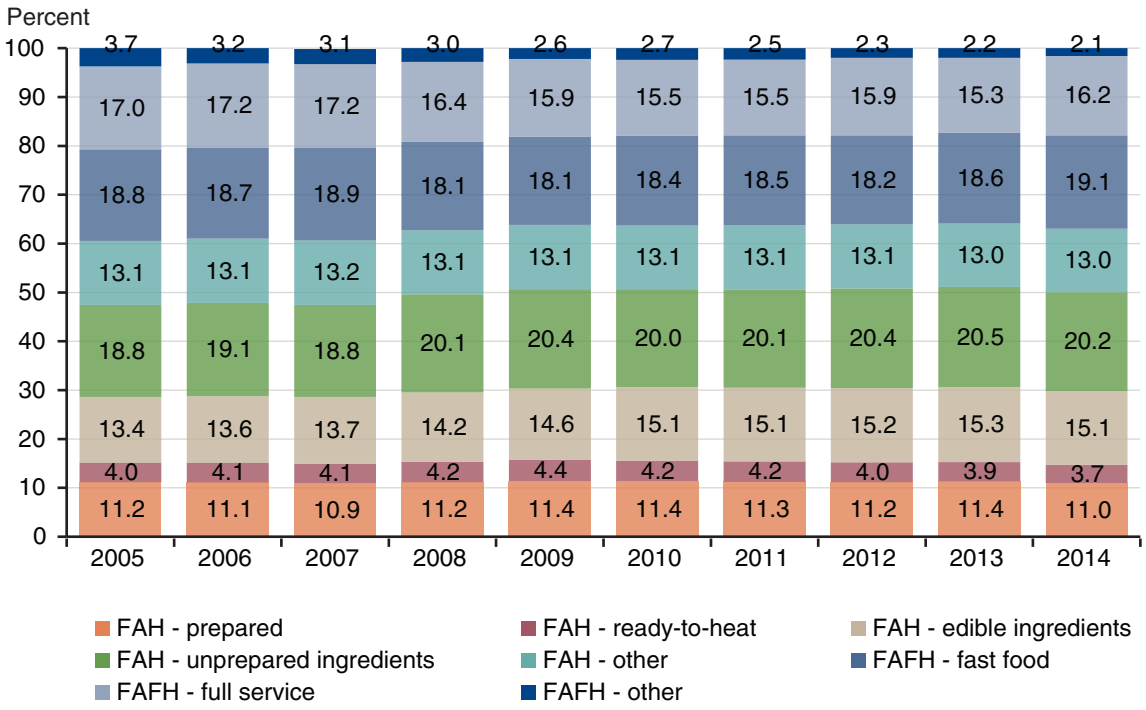
[24]The categories and their names are not identical to those in Okrent and Kumcu (2016) because the UCCs provided by CES are less detailed than the UPCs used in their dataset.

canned meats, fruits, and vegetables, and fresh fruits and vegetables.[25] Finally, unprepared ingredients are foods that require preparation prior to consumption, such as eggs, rice, or raw meat. Nonalcoholic drinks are self-explanatory. The other FAH food category includes candy and chewing gum, baby food, and vitamin supplements. FAFH spending on meals and snacks is separated into three categories: fast food, full service, and other (e.g., catered affairs and vending machines).

Households allocated the largest shares of food expenditures to fast food (FAFH) and unprepared ingredients (FAH) throughout all of the years examined, with each category accounting for almost one-fifth of the total food budget (fig. 4.3). Changes in expenditure shares for each category during the period studied ranged from 0.5 percentage points (prepared foods) to 1.9 percentage points (edible ingredients and full-service restaurants). From 2006 to 2010, the 4-percentage-point decline in the share of FAFH expenditures was largely due to the 1.7-percentage-point decline in spending at full-service restaurants, whereas the increase in FAH expenditures mostly stemmed from the 1.5-percentage-point increase in spending on edible ingredients.

Figure 4.3

Percentage change in total food, food-at-home, and food-away-from-home expenditures, 2005-14



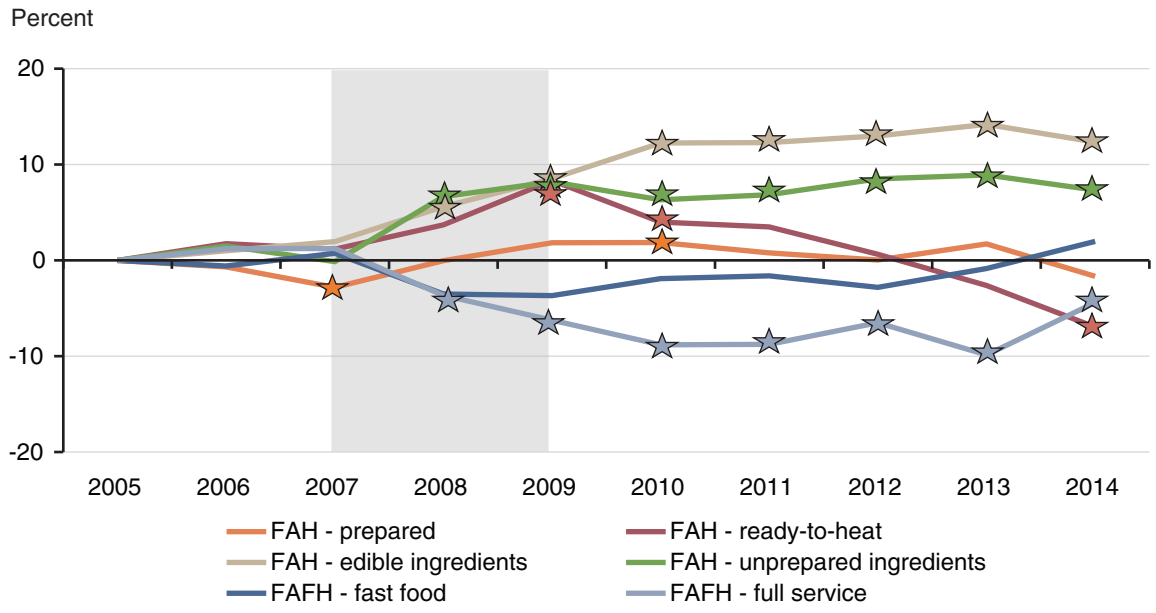
Note: FAH = food at home. FAFH = food away from home.
Source: U.S. Department of Labor, Bureau of Labor Statistics Consumer Expenditure Survey.

[25]This category includes salad dressings because it does not need to be cooked, and is generally used with other items in this section, particularly fresh vegetables.

Examination of the percent change in expenditure shares for each category (excluding other FAH and FAFH), relative to the 2005 shares, provides a more clear picture (fig. 4.4). The categories with the greatest food expenditure shares had the greatest percent change from 2005 to 2010: edible ingredients (12-percentage-point increase) and full-service restaurants (9-percentage-point decrease). The percent change from 2005 was statistically significant beginning in 2008 for both of these categories and for unprepared ingredients. FAFH expenditures rebounded beginning in 2010, but the shares of food expenditures spent at full-service restaurants remained 4 percentage points below pre-recession shares in 2014. Although spending on FAFH substitutes—prepared and ready-to-heat foods—increased during the recession, both declined by 2014, with prepared food returning to the 2005 level and ready-to-heat food falling even further below the 2005 level. The consistently higher budget shares on edible and unprepared ingredients after the recession suggest that while the recession may have pushed households to prepare more food at home, there may also have been a general shift in preferences for home-cooked meals.

Figure 4.4

Percent change in share of real food expenditures by type, 2005-14



Note: FAH = food at home. FAFH = food away from home. The stars indicate that the shares are statistically different from 2005 ($p<0.05$).
Source: USDA, Economic Research Service calculations from U.S. Department of Labor, Bureau of Labor Statistics Consumer Expenditure Survey data.

Differences Across Household Types

Studies find that income, prices, and time constraints can affect total food expenditures, particularly for convenient FAH (i.e., prepared and ready-to-heat food) and fast food (e.g., Jabs and Devine, 2006; Okrent and Kumcu, 2016). This next section explores changes in food expenditure allocations during the Great Recession across various household types—by income and participation in

USDA's Supplemental Nutrition Assistance Program (SNAP),[26] presence of at least one elderly individual or child in the household, and age of the oldest child for households with children. To ensure that differences in household size do not overstate differences across these various socioeconomic groups, the analysis compares average per capita expenditures within each group.[27]

Comparison by Income Quintiles

Households in the lowest, middle, and highest income quintiles had average incomes of $11,467, $48,351, and $149,498, respectively, in 2005.[28] As expected, households in the highest income quintile had the highest average per capita food expenditures in all years examined, while households in the lowest income quintile had the lowest (table 4.1). Middle-income households decreased their average per capita food expenditures during the Great Recession, which reduced the gap between the lowest and middle quintile by $279 from 2005 to 2014.

Similar to total food expenditures, the share of food expenditures allocated to FAFH was highest for the highest income quintile and lowest for the lowest income quintile but declined during the Great Recession for all households, regardless of income (table 4.1). The lowest income quintile had the sharpest decline in the share of FAFH between 2007 and 2009 (3 percentage points, or 10 percent). Households in the middle-income quintile had the slowest recovery following the recession; in 2014, the share allocated to FAFH for this group remained 3 percentage points (7 percent) below the 2005 share.

Table 4.1
Food expenditures by income quintiles, 2005-14

	Average food expenditures (per capita, 2005 dollars)			Percent of food expenditures on FAFH		
	Lowest quintile	Middle quintile	Highest quintile	Lowest quintile	Middle quintile	Highest quintile
2005	$2,255	$2,766	$3,293	32.2	40.9	44.6
2006	$2,281	$2,763	$3,521**	31.6	39.8	44.7
2007	$2,256	$2,751	$3,451**	33.1	39.5	44.9
2008	$2,340	$2,691	$3,378	29.8**	37.9**	44.0**
2009	$2,309	$2631**	$3,260	29.8**	37.9**	41.8**
2010	$2,227	$2557**	$3,290	30.9	36.8**	41.3**
2011	$2,229	$2,489	$3,390	30.2**	36.0**	42.1**
2012	$2,304	$2,532	$3,296	29.8**	37.4**	42.2**
2013	$2,304	$2,549	$3,190	30.0**	36.6**	41.2**
2014	$2,313	$2,545	$3,324	31.0	38.1**	43.7

Note: ** indicates that the expenditures are statistically different from 2005 (p<0.05).

Source: USDA, Economic Research Service estimates using U.S. Department of Labor, Bureau of Labor Statistics Consumer Expenditure Survey data.

[26]The Food, Conservation, and Energy Act of 2008 (farm bill) changed the name of the Food Stamp Program to SNAP as of October 1, 2008.

[27]Annual averages for each group are calculated on a per capita basis—i.e., household expenditures divided by household size. See BLS website for details.

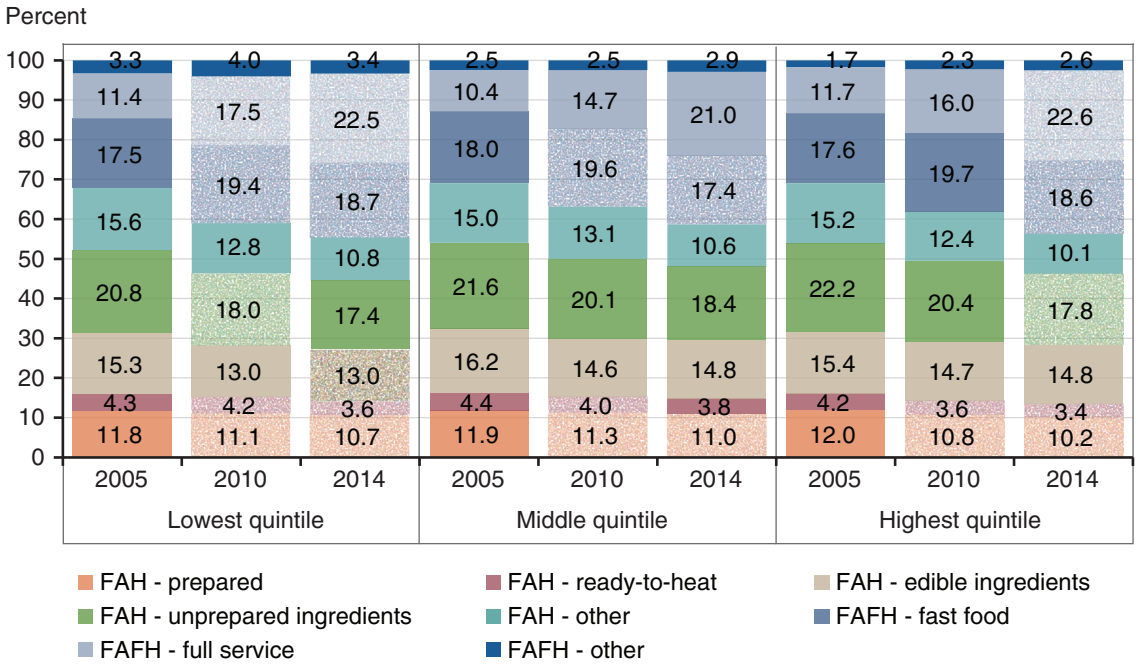
[28]Income quintiles are based on pre-tax income. This includes all potential income sources, such as unemployment insurance, workers' compensation, and alimony, in addition to wages received. In 2005, the income quintiles are separated by the following thresholds: $20,000, $37,710, $60,000, and $91,240.

Changes in the share of FAFH expenditures over time for all three income quintiles were driven largely by changes in spending at full-service restaurants (fig. 4.5). The share spent at full-service restaurants is positively related to income, with the highest income quintile allocating at least 10 percentage points more than the lowest income quintile. Between 2005 and 2010, middle- and high-income households decreased their share of expenditures at full-service restaurants. In comparison, over the same period, only households in the highest income quintile decreased fast-food expenditures. Throughout all the years examined, all income quintiles maintained similar shares of expenditures at fast-food restaurants (between 17.1 and 19.7 percent).

Over all 9 years examined, households in the lowest income quintile spent the most on unprepared ingredients and had a larger share of their food expenditures in every FAH category than households in the middle and highest income quintiles. From 2005 to 2010, middle- and high-income households increased their share of expenditures on edible and unprepared ingredients; middle-income households maintained these higher shares through 2014 for both categories, while high-income households only did so for edible ingredients. Low-income households increased their share of edible ingredients in 2010, relative to 2005, and increased their share of unprepared ingredients in 2014.

Figure 4.5

Percent change in share of real food expenditures by type, 2005-14



Note: FAH = food at home. FAFH = food away from home. FAH – Other includes all beverages. A solid color for 2010 and 2014 indicates statistically significant change from 2005 ($p<0.05$), whereas the lighter shading indicates an insignificant change.
Source: USDA, Economic Research Service calculations from U.S. Department of Labor, Bureau of Labor Statistics Consumer Expenditure Survey data.

Comparison by SNAP Participation and Eligibility

SNAP provides households with a cash-like benefit that can be used to purchase groceries that will be taken home; benefits cannot be used to purchase hot foods and food that will be eaten in the store.[29] SNAP caseloads increased by 56 percent during the Great Recession. This change stemmed partially from increasing need, as the number of people in poverty increased by 26 percent, but also from changes in SNAP policies that made the application process easier and the benefits more generous (Andrews and Smallwood, 2012). For example, the 2009 American Recovery and Reinvestment Act (ARRA) expanded eligibility by temporarily suspending the work requirement for able-bodied adults without dependents. ARRA also increased SNAP benefit amounts, which helped reduce food insecurity and increased the SNAP budget share allocated to food by a greater amount than a similar increase in income (Nord and Prell, 2011; Beatty and Tuttle, 2015). Thus, changes in food expenditures during the Great Recession among low-income households likely vary by SNAP participation status. In the next section, we compare food expenditures among SNAP participants with those of income-eligible and income-ineligible nonparticipants.[30]

From 2005 to 2014, income-ineligible nonparticipants had the highest average per capita food expenditures, while SNAP participants had the lowest (table 4.2). Over the same period, SNAP participants and eligible nonparticipants had insignificant changes in their food expenditures. Ineligible nonparticipants increased per capita spending in 2006 and 2007 relative to 2005. The difference in food expenditures between SNAP participants and income-eligible nonparticipants was driven largely by differences in household size. The lower per capita food expenditures for SNAP households may be partially attributable to economies of scale. In this dataset, SNAP households tend to be larger than income-eligible nonparticipant households because a higher proportion of SNAP households have children. When food expenditures are compared for the entire household rather than for each household member, the average for SNAP participant households is nearly three times higher than that for income-eligible nonparticipant households.[31]

Eligible nonparticipants also had a higher share of their food budget allocated to FAFH than did SNAP participants, which is not surprising given that SNAP supports the purchase of food for home preparation and consumption (table 4.1).[32] While income-ineligible households decreased their share of food spending on FAFH in 2008-14 relative to 2005, SNAP households had no statistically significant changes in FAFH share throughout the entire 2005-14 period. However, relative to 2005, income-eligible nonparticipants had a 2-percentage-point decline in the share of FAFH in 2008 and 2012 (8- and 9-percent decline, respectively).

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[29]Restaurants can also be authorized to accept SNAP benefits from qualified homeless, elderly, or disabled individuals for low-cost meals in some areas. See USDA Food and Nutrition Service website on SNAP for more details.

[30]A household is eligible to participate in SNAP if its monthly gross income is below 130 percent of the poverty line and its monthly net income is below 100 percent of the poverty line. However, categorical eligibility raises or eliminates these limits in some States. Furthermore, the Consumer Expenditure Survey (CES) reports annual income, and low-income households can experience income volatility over the year, making them eligible during some months but not others. Thus, the income limit is set at 150 percent of the poverty line according to household size.

[31]Some of the eligible nonparticipant households may also be misclassified SNAP participants, as studies find that survey respondents underreport SNAP participation (e.g., Meyer et al., 2009).

[32]SNAP benefits can only be redeemed at authorized food retailers (see FNS website for details).

Table 4.2
Food expenditures by participation in and eligibility for the Supplemental Nutrition Assistance Program, 2005-14

	Average food expenditures (per capita, 2005 dollars)			Percent of food expenditures on FAFH		
	SNAP participants	Eligible non-participants	Ineligible non-participants	SNAP participants	Eligible non-participants	Ineligible non-participants
2005	$1,685	$2,136	$2,917	26.9	33.5	41.6
2006	$1,685	$2,113	$3,023**	26.6	32.1	41.3
2007	$1,627	$2,173	$2,994**	26.3	34.8	40.9
2008	$1,745	$2,236	$2,962	27.3	30.8**	39.5**
2009	$1,761	$2,215	$2,895	25.0	31.4	38.7**
2010	$1,647	$2,138	$2,850	24.9	32.5	38.9**
2011	$1,695	$2,180	$2,891	25.9	31.6	38.7**
2012	$1,652	$2,261	$2,888	25.3	31.2**	39.1**
2013	$1,816	$2,197	$2,881	26.9	31.5	38.5**
2014	$1,667	$2,257	$2,849	26.3	33.2	39.9**

Note: SNAP = Supplemental Nutrition Assistance Program. ** indicates that the expenditures are statistically different from 2005 ($p<0.05$).

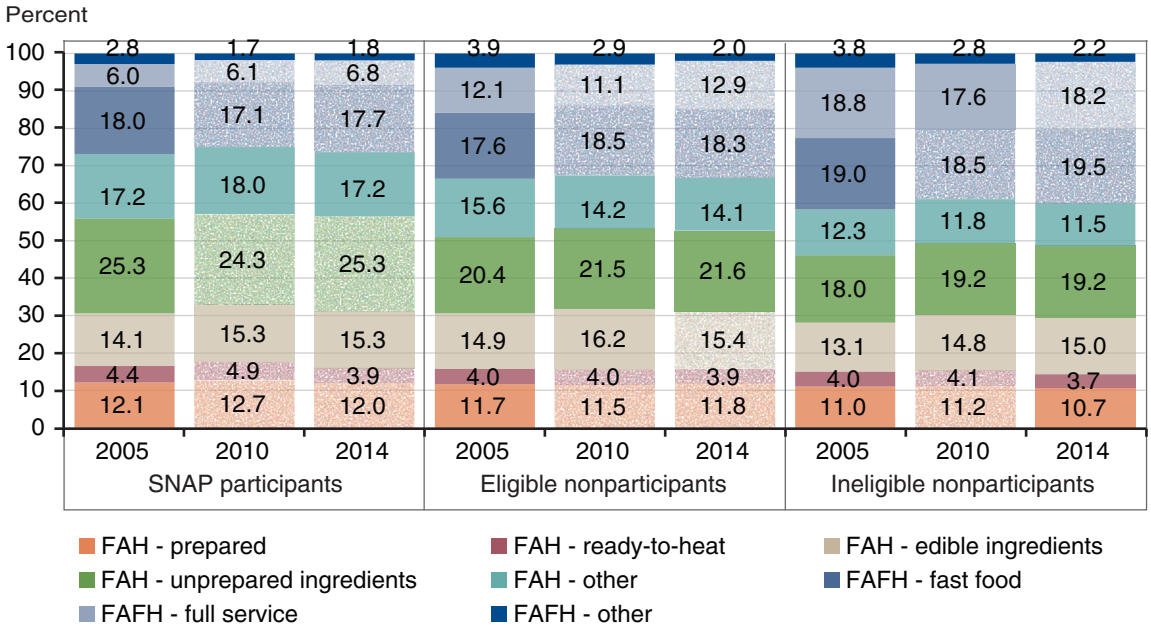
Source: USDA, Economic Research Service estimates using U.S. Department of Labor, Bureau of Labor Statistics Consumer Expenditure Survey data.

The decline in the share of FAFH expenditures from 2005 to 2010 for ineligible nonparticipants was primarily driven by the 1-percentage-point (6 percent) decline in the share of expenditures at full-service restaurants (fig. 4.6). Similar to the differences when viewed by income quintile, SNAP participants allocated at least 11 fewer percentage points in food expenditures to full-service restaurants than did income-ineligible nonparticipants for the entire period examined; eligible nonparticipants allocated at least 5 fewer percentage points than income-ineligible nonparticipants. In contrast, the share of food expenditures allocated to fast food was relatively similar across all three groups and exhibited no significant changes in response to the Great Recession.

All three household groups increased the share of spending allocated to FAH edible ingredients during the Great Recession; for SNAP participants and ineligible nonparticipants, the share remained higher in 2014. The share allocated to unprepared ingredients increased by a little over 1 percentage point in 2010 for both nonparticipant groups and remained higher than 2005 in 2014. However, both groups consistently spent a lower share of expenditures on unprepared ingredients than SNAP participants, which may partially explain why the share did not increase for SNAP participants in response to the recession. Ineligible households also decreased the share of expenditures on ready-to-heat and prepared foods in 2014.

Figure 4.6

Share of food expenditures by type and by participation in and eligibility for the Supplemental Nutrition Assistance Program—2005, 2010, 2014



Note: FAH = food at home. FAFH = food away from home. FAH – other includes all beverages. A solid color for 2010 and 2014 indicates statistically significant change from 2005 ($p<0.05$), whereas the lighter shading indicates an insignificant change.
Source: USDA, Economic Research Service calculations from U.S. Department of Labor, Bureau of Labor Statistics Consumer Expenditure Survey data.

Comparison by Presence of an Elderly Person in the Household

On average, per capita expenditures did not change between 2005 and 2014 among households with an elderly individual (table 4.3).[33] In contrast, expenditures for households without an elderly individual were significantly different from their 2005 expenditures for all but 2 of the years examined, decreasing by $230 (8 percent) from 2006 to 2010 and remaining relatively stable thereafter. Thus, by 2014, households without an elderly individual spent $133 (5 percent) less per person than they did in 2005.

The FAFH share of total food spending was at least 8 percentage points lower for households with an elderly individual than for households without older individuals for all 9 years examined (table 4.3). During the Great Recession, the share of expenditures allocated to FAFH by households without an elderly member declined 3 percentage points (8 percent) from 2005 to 2010 and remained below 2005 levels through 2014. In contrast, households with an elderly individual increased their share of spending on FAFH by 2 percentage points (8 percent) in 2014 relative to 2005. This difference suggests that elderly individual(s) may have a less volatile income, coinciding with studies that find that economic downturns affect elderly poverty rates much less than poverty rates for other age groups (e.g., Bitler and Hoynes, 2015). Furthermore, findings in this analysis indicate that the recession did not have long-term effects on elderly households, which recovered more quickly than other households, consistent with findings by Todd (2014).

[33]The CES identifies an individual older than age 64 as elderly. Elderly households are those with at least one elderly individual, regardless of the composition of the remainder of the household (e.g., whether there are any children).

Table 4.3
Food expenditures by presence of elderly, 2005-14

	Average food expenditures (per capita, 2005 dollars)		Percent of food expenditures on FAFH	
	Elderly	No elderly	Elderly	No elderly
2005	$2,713	$2,722	29.9	42.1
2006	$2,705	$2,838**	30.6	41.4
2007	$2,787	$2,799**	30.6	41.6
2008	$2,753	$2,784	29.4	39.8**
2009	$2,819	$2,670	28.7	39.0**
2010	$2,673	$2,608**	28.8	39.0**
2011	$2,835	$2,618**	29.4	38.7**
2012	$2,781	$2,616**	29.8	38.6**
2013	$2,787	$2,604**	30.4	38.2**
2014	$2,763	$2,589**	32.2**	39.5**

Note: **indicates that the expenditures are statistically different from 2005 (p<0.05).

Source: USDA, Economic Research Service estimates using U.S. Department of Labor, Bureau of Labor Statistics Consumer Expenditure Survey data.

The higher share of FAFH expenditures among households without an elderly individual was mostly due to their higher share of fast-food expenditures, which was at least 8 percentage points higher than that among households with elderly individuals over all of the years examined (fig. 4.7). Both household types had small, but significant, increases in the share of food spending allocated to unprepared and edible ingredients between 2005 and 2010; these increases persisted through 2014 for households without an elderly individual. In 2014, households with an elderly person had a small decline in expenditures on prepared and ready-to-heat foods—0.7 and 0.6 percentage points (5 and 13 percent), respectively.

Comparison by Presence of Children in the Household

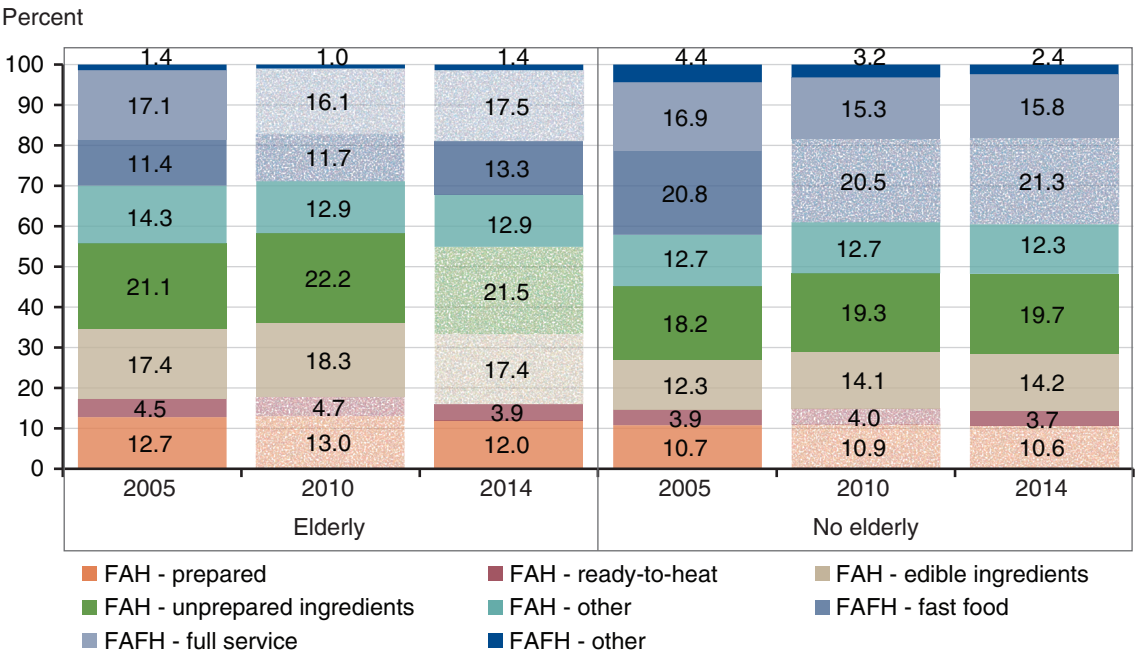
Households with at least one child spent about $1,000 less per capita per year than households without children from 2005 to 2014 (table 4.4).[34] This is not surprising given that households with children are generally larger, allowing for economies of scale in food purchases. Furthermore, young children generally require fewer calories than adults. Households with children had a more rapid decline in average per capita food expenditures in response to the Great Recession, falling by $83 (4 percent) from 2005 to 2009; spending among households without children decreased by $91 (3 percent) from 2005 to 2010. Both household types remained below their respective 2005 spending level in 2014: expenditures dropped $148 (7 percent) for households with at least one child and $128 (4 percent) for those without a child.

Throughout the period, the share of food expenditures allocated to FAFH was consistently higher for households without children, suggesting that it could be more difficult, financially and logistically, for households with children to eat out (table 4.4). Nevertheless, both groups responded similarly to the Great Recession. From 2005 to 2010, the share allocated to FAFH decreased by about 4 percentage points (9 percent) for households with children and by 3 percentage points (7 percent) for those without children. By 2014, the shares remained 3 and 2 percentage points (7 and 4 percent), respectively, below 2005 levels.

[34]The CES identifies a child as an individual under age 18.

Figure 4.7

Share of food expenditures by food type and by presence of elderly (2005, 2010, 2014)



Note: FAH = food at home. FAFH = food away from home. FAH – other includes all beverages. A solid color for 2010 and 2014 indicates statistically significant change from 2005, whereas the lighter shading indicates an insignificant change ($p<0.05$).
Source: USDA, Economic Research Service calculations from U.S. Department of Labor, Bureau of Labor Statistics Consumer Expenditure Survey data.

Table 4.4

Food expenditures by presence of at least one child, 2005-2014

	Average food expenditures (per capita, 2005 dollars)		Percent of food expenditures on FAFH	
	Child	No child	Child	No child
2005	$2,043	$3,114	38.6	40.0
2006	$2,052	$3,231*	38.3	39.5
2007	$2,011	$3,202*	37.7	40.0
2008	$1,992	$3,183	36.8*	37.8*
2009	$1,960*	$3,086	35.4*	37.2*
2010	$1,840*	$3,022*	35.1*	37.3*
2011	$1,885*	$3,069	35.6*	36.9*
2012	$1,886*	$3,049	34.8*	37.2*
2013	$1,883*	$3,012*	35.1*	36.6*
2014	$1,895*	$2,986*	35.8*	38.3*

Note: The stars indicate that the expenditures are statistically different from 2005 ($p<0.05$).

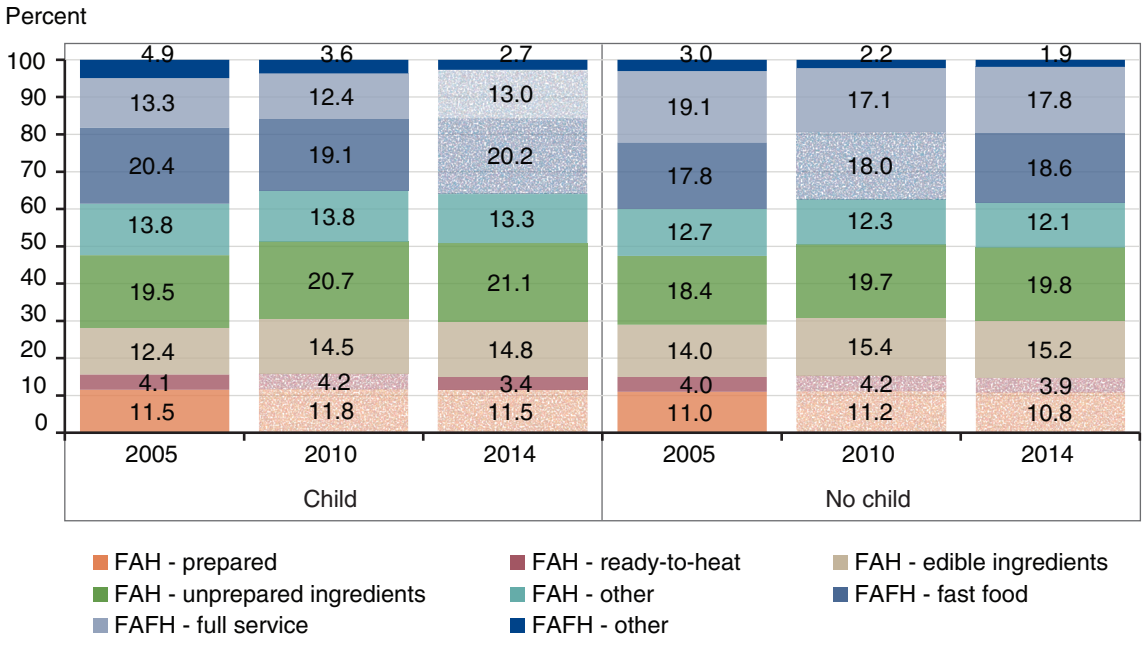
Source: USDA, Economic Research Service estimates using U.S. Department of Labor, Bureau of Labor Statistics Consumer Expenditure Survey data.

Although households without children allocated a greater share of food expenditures to full-service restaurants (at least 4 percentage points) than households with children for the entire sample period, they allocated a smaller share (less than 3 percentage points) to fast-food restaurants (fig. 4.8). Nevertheless, both household types reduced the share allocated to full-service expenditures in 2010 relative to 2005. Households with children also reduced the share of food spending at fast-food restaurants, although the shares allocated to both FAFH categories returned to pre-recession levels by 2014. Households without children maintained a lower share of expenditures at full-service restaurants from 2010 to 2014 relative to 2005 but increased spending at fast-food restaurants. Both household types increased the share of food expenditures on edible and unprepared ingredients from 2005 to 2010 and maintained these higher shares through 2014.

There are clear differences in FAFH expenditure patterns for households with children by age—younger than age 6, age 6 to 11, and age 12 to 17. As expected, households whose oldest child was age 12 to 17 had the highest average per capita food expenditures throughout the period, likely because older children generally require more calories (table 4.5). Food expenditures for households in the two categories with children younger than age 12 were relatively similar to each other, which could be an indication that the dietary needs among children are relatively similar until their teenage years, when their calorie requirement rises.

Figure 4.8

Share of food expenditures by presence of at least one child—2005, 2010, 2014



Note: FAH = food at home. FAFH = food away from home. FAH – other includes all beverages. A solid color for 2010 and 2014 indicates statistically significant change from 2005 ($p<0.05$), whereas the lighter shading indicates an insignificant change.
Source: USDA, Economic Research Service calculations from U.S. Department of Labor, Bureau of Labor Statistics Consumer Expenditure Survey data.

Table 4.5
Food expenditures by children's age, 2005-14

	Average food expenditures (per capita, 2005 dollars)			Percent of food expenditures on FAFH		
	Oldest younger than 6	Oldest 6-11	Oldest 12-17	Oldest younger than 6	Oldest 6-11	Oldest 12-17
2005	$1,917	$1,992	$2,194	40.2	39.9	38.8
2006	$1,984	$2,049	$2,173	39.9	38.5	39.2
2007	$1,897	$1,994	$2,184	37.3	38.9	38.2
2008	$1,903	$1,924	$2,197	37.3*	37.4*	37.7
2009	$2,008	$1,916	$2,082*	33.6*	37.5	37.3
2010	$1,778*	$1,795*	$2,019*	35.8*	36.3*	36.4*
2011	$1,890	$1,874	$2,012*	37.2*	37.3*	35.7*
2012	$1,830	$1,911	$2,070*	36.1*	36.7*	34.8*
2013	$1,914	$1,807*	$2,030*	35.7*	35.7*	35.1*
2014	$1,869	$1,925	$2,023*	37.1*	37.2*	35.6*

Note: The stars indicate that the expenditures are statistically different from 2005 ($p<0.05$).

Source: USDA Economic Research Service estimates using U.S. Department of Labor, Bureau of Labor Statistics Consumer Expenditure Survey data.

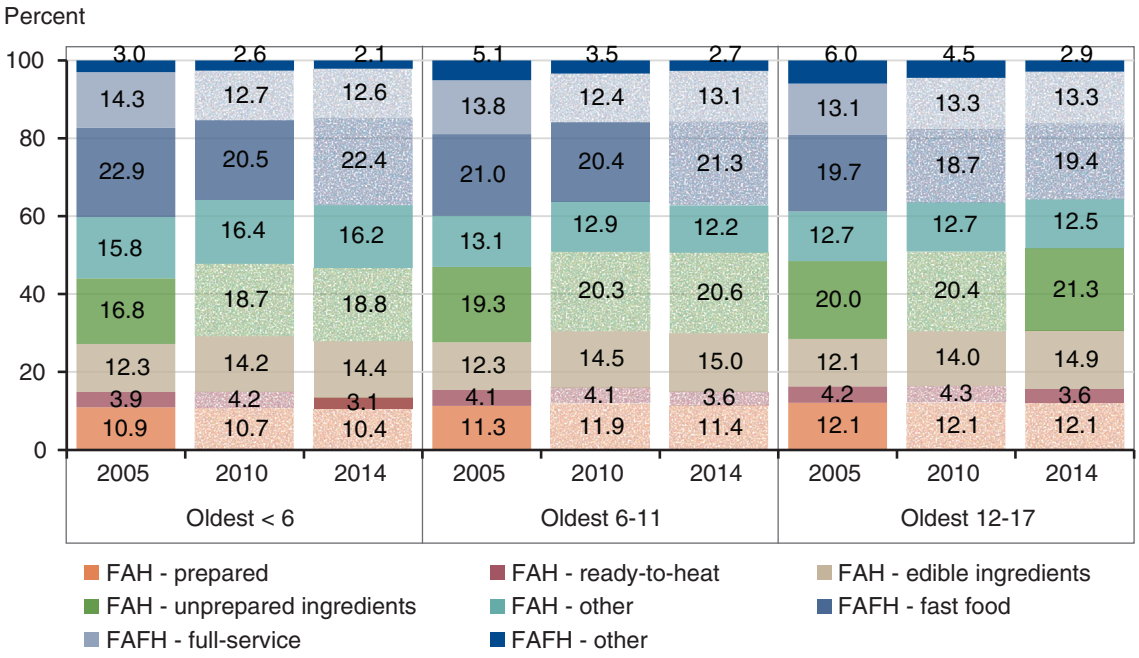
Average per capita food expenditures declined for all groups of households with children between 2005 and 2010. During this period, by ascending age of the oldest child, household expenditures declined by $139, $197, and $174 (7, 10, and 8 percent), respectively. Although households whose oldest child was age 6 to 11 had the greatest decline, by 2014, average per capita food expenditures were not statistically different from those in 2005. In contrast, per capita food expenditures for households whose oldest child was age 12 to 17 did not recover by 2014, remaining $171 (8 percent) below 2005 levels.

Despite the differences in total food expenditures, all households with children, regardless of the oldest child's age, allocated a similar share to FAFH (table 4.5). Between 2005 and 2010, all three household types had a significant decline in the share of FAFH expenditures: 4 percentage points for those whose oldest child was younger than age 6 or age 6 to 11 (11 and 9 percent, respectively), and 2 percentage points (6 percent) for those whose child was age 12 to 17. By 2014, FAFH shares for all three household types remained 3 percentage points (8, 7, and 8 percent by ascending age of oldest child) below the 2005 shares.

Despite the statistically significant decline in the overall share of FAFH expenditures for all three household types, only the share allocated to fast food declined significantly between 2005 and 2010 among households whose oldest child was age 11 or younger—it dropped 2.4 percentage points (11 percent) for households whose oldest child younger than age 6 and 0.6 percentage points (3 percent) for those whose oldest child was age 6 to 11 (fig. 4.9). For these households, the share spent at fast-food restaurants returned to pre-recession shares by 2014. The change in the share allocated to full-service restaurants was not statistically significant for any of the household groups in 2010 and 2014. With respect to FAH spending, the share allocated to edible ingredients increased for all three household types by 2010: 1.9 percentage points for households with an oldest child younger than age 6 or age 12 to 17 (15 and 16 percent, respectively), and 2.2 percentage points (18 percent) for those with an oldest child age 6 to 11. By 2014, the share of these expenditures had grown even more.

Figure 4.9

Share of food expenditures by children's age—2005, 2010, 2014



Note: FAH = food at home. FAFH = food away from home. FAH – Other includes all beverages. A solid color for 2010 and 2014 indicates statistically significant change from 2005, whereas the lighter shading indicates an insignificant change ($p<0.05$).
Source: USDA, Economic Research calculations from U.S. Department of Labor, Bureau of Labor Statistics Consumer Expenditure Survey data.

In addition, for those with an oldest child age 12 to 17, the share of food expenditures allocated to unprepared ingredients increased by 1.3 percentage points (6 percent) relative to 2005.

Conclusion

This analysis finds that households replaced a declining share of FAFH expenditures with FAH expenditures during the Great Recession and through the recovery period until 2014. Disaggregating food expenditures by the level of preparation needed for at-home consumption (FAH) or by the level of service when dining out (FAFH) illustrates that the main substitution across categories was an increase in the share of expenditures allocated to edible and unprepared ingredients in place of full-service restaurants. These results are consistent with findings that service industries were hit the hardest during the Great Recession (e.g., Petev et al., 2012; De Nardi et al., 2012). In contrast, most households maintained their share of expenditures at fast-food restaurants throughout the period, which coincided with the continued growth in the number of quick-service restaurants throughout the recession (chapter 6) and the observed increase in the share of calories from fast foods among working age adults in 2013-14, relative to 2005-06 (Todd, 2017). Overall, changes in food spending allocations across categories were relatively small, with the largest change from one year to the next being less than 1 percentage point for all categories. This suggests that households have strong preferences for their food choices, trying to find ways to lower spending within categories rather than making changes across categories.

Spending levels and patterns differ across household types. Higher income households spent more per capita and allocated a larger share of their food spending to FAFH, while the lowest income households, particularly those that participate in SNAP, had the lowest share of FAFH expenditures. These differences in FAFH shares are mostly attributed to differences in expenditures at full-service restaurants. The shares of expenditures allocated to fast-food restaurants are relatively similar across household types, which may be partially due to fast-food restaurants being cheaper on average than quick-service and full-service restaurants.

Households with an elderly individual or with children spent a smaller share of their food budgets on FAFH than households without such members. It could be that cooking is more cost-effective for these larger household or that children and elderly individual(s) can help prepare meals at home, although some elderly individuals are less mobile. It could also be an indication that there are generational differences in preferred types of meals or consumption patterns, or that dietary restrictions make it difficult for these households to purchase FAFH. Households with an elderly individual allocated a lower share of their food budgets to fast-food restaurants than did households without elderly members, which could suggest that elderly individuals are less time-constrained (a main appeal of fast food). Households with children spent less per capita on food than households without children, likely due to economies of scale. Lower prices for children's meals, on average, may also contribute to lower per capita food expenditures for these household types.

Differences in spending patterns across household types were greater than their changes within each household type from 2005 to 2014. Across household types, the share of food expenditures allocated to FAFH decreased during the Great Recession and the share of spending on edible and unprepared FAH ingredients increased. These trends continued through 2014 for most household types, perhaps suggesting a general shift toward home-cooked meals, particularly if these trends persist. However, most households maintained their spending on fast food throughout the period, which suggests that time constraints remain or that fast food plays an important role in most household diets. It could also be that there are cheaper items available at fast-food restaurants, although data limitations prevent us from exploring how prices or quantities of food purchased changed during this period.

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Appendix: Categories by Uniform Commercial Codes

FAH – PREPARED

010210 CEREAL
020310 FRESH BISCUITS, ROLLS, MUFFINS
020410 CAKES AND CUPCAKES
020510 COOKIES
020610 CRACKERS
020620 BREAD AND CRACKER PRODUCTS
020710 DOUGHNUTS, SWEETROLLS, COFFECAKE
020820 FRESH PIES, TARTS, TURNOVERS
100410 ICE CREAM AND RELATED PRODUCTS
180310 POTATO CHIPS AND OTHER SNACKS
180611 PREPARED SALADS
180612 PREPARED DESSERTS
180710 MISC. PREPARED FOODS

FAH – PREPARED (READY-TO-HEAT)

020810 FROZEN & REFRIG. BAKERY PROD.
130121 FROZEN FRUITS
140110 FROZEN VEGETABLES
180110 SOUP
180210 FROZEN MEALS
180220 FROZ/PREP. FOOD OTH THAN MEALS

FAH – UNPREPARED (EDIBLE INGREDIENTS)

020110 WHITE BREAD
020210 BREAD OTHER THAN WHITE
040610 CANNED HAM
070110 CANNED FISH AND SEAFOOD
100210 CHEESE
110110 APPLES
110210 BANANAS
110310 ORANGES
110410 OTHER FRESH FRUITS
110510 CITRUS FRUITS EXCL. ORANGES
120210 LETTUCE
120310 TOMATOES
120410 OTHER FRESH VEGETABLES
130310 CANNED FRUITS
130320 DRIED FRUITS
140210 CANNED BEANS
140220 CANNED CORN
140230 CANNED VEGETABLES MISC
140310 OTHER PROCESSED VEGETABLES
140320 OTHER PEAS

140330 OTHER BEANS
140340 OTHER VEGETABLES MISC
160212 SALAD DRESSINGS
160320 PEANUT BUTTER
180320 NUTS
180420 OLIVES, PICKLES, RELISHES

FAH – UNPREPARED (INGREDIENTS)

010110 FLOUR
010120 PREPARED FLOUR MIXES
010310 RICE
010320 PASTA CORNMEAL OTH CEREAL PRODS
030110 GROUND BEEF EXCLUDE CANNED
030210 CHUCK ROAST
030310 ROUND ROAST
030410 OTHER ROAST
030510 ROUND STEAK
030610 SIRLOIN STEAK
030710 OTHER STEAK
030810 OTHER BEEF (EXCLUDE CANNED)
040110 BACON
040210 PORK CHOPS
040310 HAM (EXCLUDE CANNED)
040410 OTHER PORK
040510 PORK SAUSAGE
050110 FRANKFURTERS
050210 BOLOGNA, LIVERWURST, SALAMI
050310 OTHER LUNCHMEAT
050410 LAMB AND ORGAN MEATS
050900 MUTTON, GOAT, GAME
060110 FRESH & FROZEN WHOLE CHICKEN
060210 FRESH OR FROZEN CHICKEN PARTS
060310 OTHER POULTRY
070230 FRESH FISH & SHELLFISH
070240 FROZEN FISH & SHELLFISH
080110 EGGS
090210 CREAM
100110 BUTTER
100510 OTHER DAIRY PRODUCTS
120110 POTATOES
150211 SUGAR
150212 ARTIFICIAL SWEETENERS
150310 OTHER SWEETS
160110 MARGARINE
160211 FATS & OILS
160310 NONDAIRY CREAM SUBSTITUTES
180410 SALT/OTHER SEASONINGS & SPICES

180510 SAUCES AND GRAVIES
180520 OTHER CONDIMENTS

DRINKS

090110 FRESH MILK ALL TYPES
130110 FROZEN ORANGE JUICE
130122 FROZEN FRUIT JUICES
130211 FRESH FRUIT JUICE
130212 CANNED/BOTTLE FRUIT JUICE
140410 FROZEN VEGETABLE JUICES
140420 FRESH & CANNED VEGETABLE JUICES
170110 COLA DRINKS
170210 OTHER CARBONATED DRINKS
170310 ROASTED COFFEE
170410 INSTANT/FREEZE DRIED COFFEE
170510 NONCARB FRUT FLAV/LEMADE NONFROZ
170520 TEA
170530 OTHER NONCARB. BEVERAGES/ICE

FAH – OTHER

150110 CANDY AND CHEWING GUM
180620 BABY FOOD
180720 VITAMIN SUPPLEMENT

FAFH – FAST FOOD

190111 LUNCH AT FAST FOOD
190211 DINNER AT FAST FOOD
190311 SNACKS AT FAST FOOD
190321 BREAKFAST AT FAST FOOD

FAFH – FULL SERVICE

190112 LUNCH AT FULL SERVICE
190212 DINNER AT FULL SERVICE
190312 SNACKS AT FULL SERVICE
190322 BREAKFAST AT FULL SERVICE

FAFH – OTHER

190113 LUNCH AT VENDING MACHINE
190114 LUNCH AT EMPLOYER
190115 LUNCH AT BOARD
190116 LUNCH AT CATERED AFFAIRS
190213 DINNER AT VENDING MACHINE
190214 DINNER AT EMPLOYER
190215 DINNER AT BOARD
190216 DINNER AT CATERED AFFAIRS
190313 SNACKS AT VENDING MACHINE

190314 SNACKS AT EMPLOYER
190315 SNACKS AT BOARD
190316 SNACKS AT CATERED AFFAIRS
190323 BREAKFAST AT VENDING MACHINE
190324 BREAKFAST AT EMPLOYER
190325 BREAKFAST AT BOARD
190326 BREAKFAST AT CATERED AFFAIRS
190911 BOARD AT FAST FOOD
190912 BOARD AT FULL SERVICE
190913 BOARD AT VENDING MACHINE
190914 BOARD AT EMPLOYER
190915 BOARD AT BOARD
190916 BOARD AT CATERED AFFAIRS
190921 CATERED AFF AT FAST FOOD
190922 CATERED AFF AT FULL SERVICE
190923 CATERED AFF AT VEND MACHINE
190924 CATERED AFF AT EMPLOYER
190925 CATERED AFF AT BOARD
190926 CATERED AFF AT CATERED AFF

Chapter 5: Demographics of Food-Away-From-Home Frequency

This chapter focuses on the frequency of FAFH acquisitions per week. It uses data from the National Household Food Acquisition and Purchase Survey (FoodAPS) to examine whether the observed increases in expenditure shares on FAFH are driven by increases in FAFH acquisitions and variation in acquisitions by demographic group. Findings indicate a positive correlation between socioeconomic status and the number of FAFH acquisitions per week.

While the household budget share for FAFH has increased (chapter 3) with variation across socioeconomic groups (chapter 4), it is unclear whether these changes are related to increases in FAFH prices (chapter 1) or increases in quantities of FAFH purchased. Studying quantities gives additional information about the purchase behavior of households. This chapter examines whether the observed increase in expenditures on FAFH is a result of more frequent trips to FAFH outlets. Otherwise, expenditure increases may reflect larger purchases per FAFH event.[35] It also compares the average weekly frequency of FAFH acquisitions by demographic groups using data from USDA's National Household Food Acquisition Survey (FoodAPS) (see box "FoodAPS and Food Away From Home"). This analysis complements the analysis in chapter 8, which delves into the relationship between proximity to food outlets and diet quality by demographic group.

Data

Using FoodAPS data, frequencies of FAFH acquisitions were calculated per week per capita by counting the number of FAFH events, identified by a unique code, divided by the number of household members. No distinctions were made by where the FAFH was acquired. Thus, visits to fast-food and full-service restaurants were treated as commensurate events. To get average frequencies, weekly frequencies were grouped by the relevant demographic characteristic of the household head. Each adult group was split into 10-year age cohorts since evidence suggests that FAFH purchases vary across age groups (Kuhns and Saksena, 2017).

Appendix 5.1 shows the average number of times an adult purchased FAFH by 10-year age cohorts and corresponding demographic variables. Because of small sample sizes, households were top-coded at 75 years old and above for the household head. Similarly, appendix table 5.2 provides statistics for households with children, defined as individuals under the age of 19, grouped by the ages that correspond to grade, middle, and high school attendance. The data are disaggregated by age to highlight any age effects that may be driving FAFH acquisition frequency. As noted by Kuhns and Saksena (2017), food purchase behavior can vary by the age of the shopper. Although conducting the analysis at the individual level admittedly adds noise to the statistics reported here because the acquisition data are reported at the household level, this method allows the number of FAFH acquisitions of children to be analyzed.

[35]While chapter 3 analyzes food expenditures over time, this chapter's analysis is cross-sectional due to the data limitations of FoodAPS, which currently has only one round of data. This chapter highlights frequency of FAFH acquisitions, rather than the quantity purchased (e.g., grams or pounds) at each FAFH acquisition with an awareness that food expenditures have been increasing for the past 30 years.

FoodAPS and Food Away From Home

The National Household Food Acquisition and Purchase Survey (FoodAPS) is a dataset jointly sponsored by USDA's Economic Research Service and Food and Nutrition Service. The data contain comprehensive information on household food acquisitions for both food-at-home (FAH) and food-away-from-home (FAFH) consumption, collected between April 2012 and January 2013, for 4,826 sample households, with sampling weights to generalize to the U.S. population. Data collected include information about individual and household characteristics, food assistance participation, purchase prices, and nutritional content. As defined by the survey, the youngest adults in the survey were 19 years old, and the oldest were over 90. Children were defined as 18 years of age and younger.

In FoodAPS, FAFH and FAH are defined by where the food is acquired. FAFH include food acquisitions from restaurants (e.g., bakery/bagel/donut shops; buffet restaurants; burger/hot dog restaurants; cafés and bakery-cafes; chicken restaurants; coffee shops and teahouses; dairy dessert shops; drinking places; miscellaneous specialty shops such as candy, cheese, juice, pretzel, or popcorn; pizza restaurants; American restaurants; Asian restaurants; European restaurants; Mexican/Tex-Mex/Latin American restaurants; seafood restaurants; steak house restaurants; other restaurants; sandwich/deli/salad shops); travel places; vending machines and food trucks; recreational places (e.g., gyms; bowling alleys; casinos; colleges; country clubs; fairs, concerts, and amusement parks); fraternal organizations; hospitals; institutions; movie theaters; municipal offices; nonfood retailers; parks and community centers; multiple places; and unknown. Food that is acquired from a restaurant and brought home for consumption is also considered FAFH. For example, delivery pizza is considered FAFH, while an apple, which is also ready to eat but does not require preparation for it to be consumed, is considered FAH. FoodAPS considers food assistance programs that feed individuals outside the home as FAFH. Such programs include the National School Lunch Program.

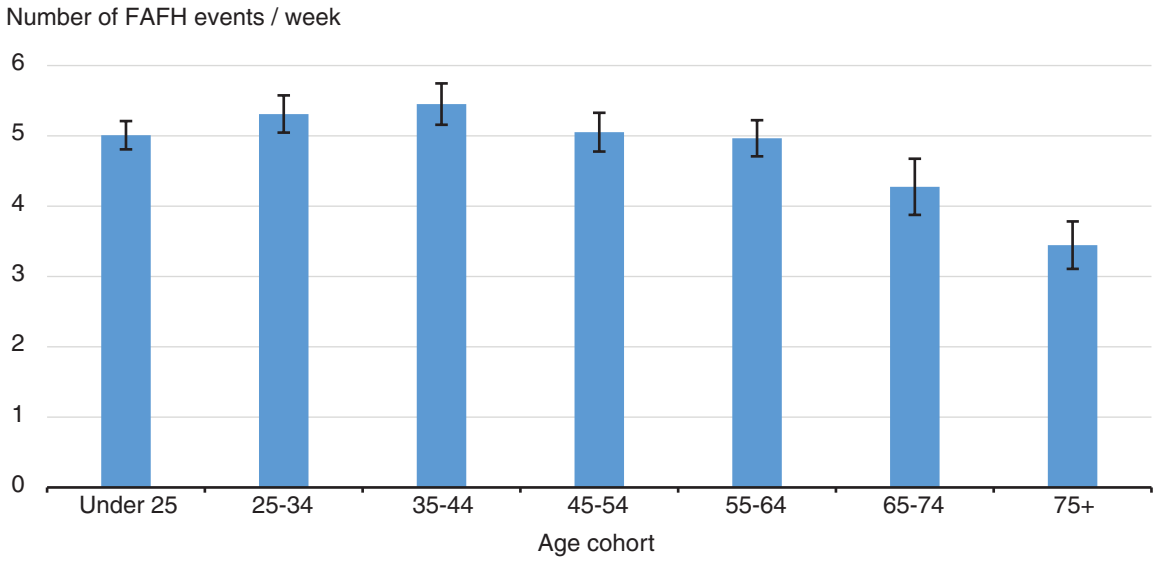
To get nationally representative results, FoodAPS provides replicate weights created by using a jackknife resampling technique. Jackknife resampling samples without replacement, dropping one observation for each permutation and is used to search for overly influential observations.

Age

Frequency of adult FAFH acquisitions is higher among younger cohorts, usually peaking with 35-44-year-olds and steadily decreasing with older cohorts (fig. 5.1). According to the U.S. Census Bureau, 25-34-year-olds have the highest labor force participation, while 45-54-year-olds have the highest average monthly earnings; 35-44-year-olds are between these two age groups in both categories. This hump-shaped pattern is consistent with lifecycle expenditure patterns of goods that are associated with labor participation (Aguiar and Hurst, 2013). Peak FAFH acquisitions among younger adults may also be attributable to more active social networks typical of this age (Bhattacharya et al., 2016), which might encourage eating out more frequently (Higgs and Thomas, 2016). Furst et al. (1996) note that convenience and social influences are important factors in making food choices. This finding is consistent with previous research that also indicates that younger adults eat out more often (Dave et al., 2009; Anderson et al., 2011; Van der Horst et al., 2011; Bezzerra et al., 2013).

Figure 5.1

Weekly frequency of FAFH by adults by age group



Note: FAFH = food away from home. Vertical error bars represent the standard error of the mean at the 95th percentile and the spread of data for each statistic.
Source: USDA, Economic Research Service using data from USDA's National Household Food Acquisition and Purchase Survey.

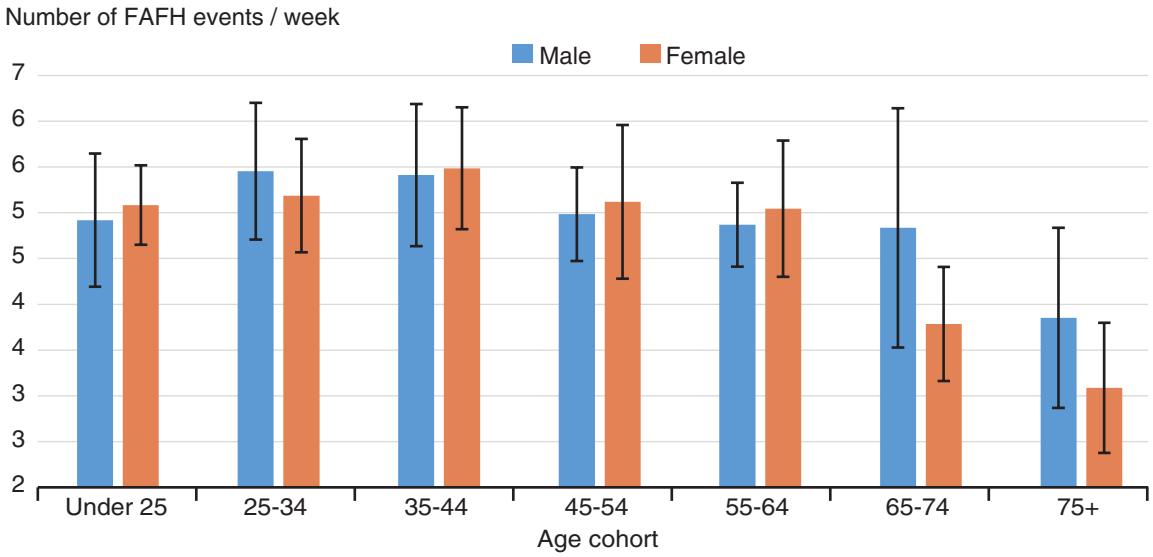
Race and Gender

Both men and women on average make five FAFH acquisitions per week. There do not seem to be statistical differences between men and women in terms of frequency of FAFH acquisitions within each age group, (fig. 5.2), a result confirmed by t-tests.[36] This is contrary to previous research that similarly compares FAFH by gender and finds that men are more frequent consumers of FAFH (Dave et al., 2009; Anderson et al., 2011; Van der Horst et al., 2011; Bezzerra et al., 2013; Seguin et al., 2016). Similarly, across all age groups, non-Hispanic Whites eat FAFH the most often, though the differences by race are small and were found not to be statistically significant (fig.5.3). It appears that the driving factor for frequency of FAFH acquisitions is age.

[36]Two-sample t-tests were performed when comparing means of demographic groups. A t-test is a statistical hypothesis test used to determine if the means of two groups, in this case frequency of FAFH acquisitions by demographic group, are equal.

Figure 5.2

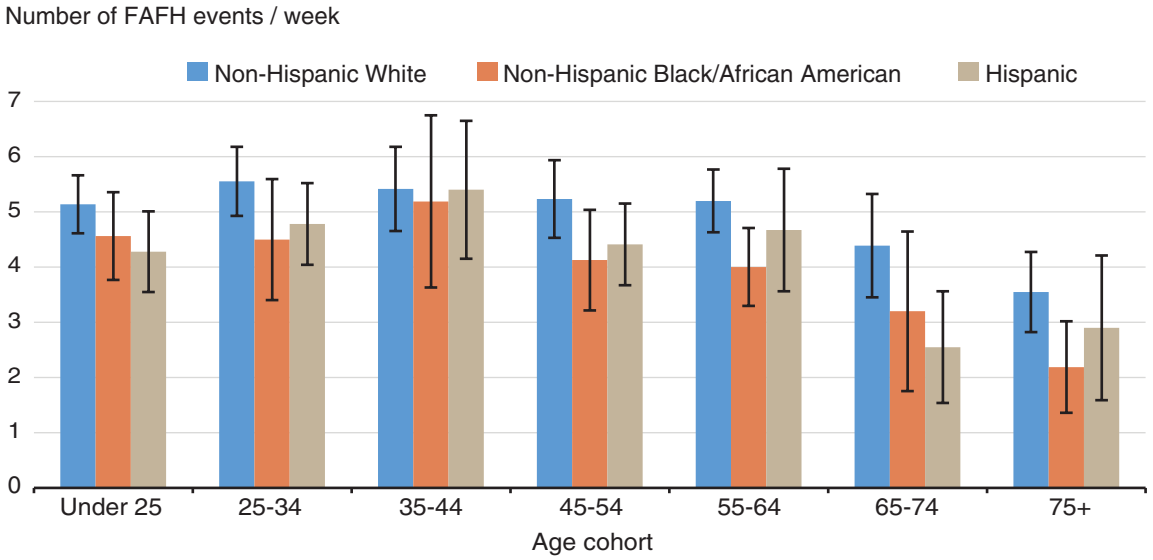
Weekly frequency of FAFH by adults by gender



Note: FAFH = food away from home. Vertical error bars represent the standard error of the mean at the 95th percentile and the spread of data for each statistic.
Source: USDA, Economic Research Service using data from USDA's National Household Food Acquisition and Purchase Survey.

Figure 5.3

Weekly frequency of FAFH by adults by race



Note: FAFH = food away from home. Vertical error bars represent the standard error of the mean at the 95th percentile and the spread of data for each statistic.
Source: USDA, Economic Research Service using data from USDA's National Household Food Acquisition and Purchase Survey.

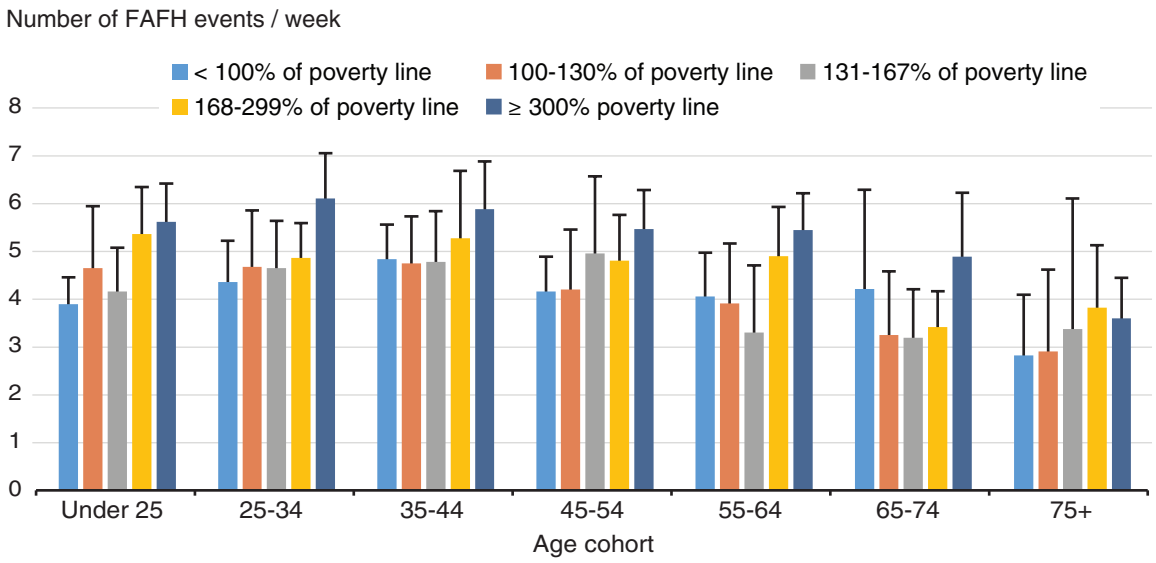
Socioeconomic Status: Income, Education, Employment, and Food Assistance Receipt

Frequency of FAFH acquisitions appears to be positively correlated with income within all age groups (fig. 5.4). Individuals whose incomes were less than 100 percent of the Federal poverty line acquired food from FAFH places much less frequently than those whose incomes were equal to or greater than 300 percent above the poverty line for the under 25, 25-34, 45-54, and 55-64 age groups. The general upward income trend (though not always statistically different across age groups) is consistent with other findings in this report, particularly that SNAP participants purchase FAFH less frequently (chapter 4) and that lower income individuals obtain an increasing number of calories from FAFH, but to a lesser extent than their higher income peers (chapter 7). In the FoodAPS survey, individuals with household income equal to or greater than 300 percent of the poverty line showed the highest number of FAFH acquisitions.[37]

Chapter 8 further delves into the frequency and nutritional content of households' food purchases by FAFH outlet type, finding that among household groups delineated by outlet-type patronage, "occasional fast food" households purchased the fewest number of calories on a weekly basis. In fact, "nonconsumers" of fast food purchased more calories. Along with the results in this chapter, this suggests that the increase in FAFH expenditures may not necessarily be the result of more frequent trips to FAFH outlets, but that individuals, especially those in households that do not patronize fast-food restaurants, may be purchasing larger quantities at each FAFH event.

Figure 5.4

Weekly frequency of FAFH by adults by percentage of poverty level



Note: FAFH = food away from home. Vertical error bars represent the standard error of the mean at the 95th percentile and the spread of data for each statistic.
Source: USDA, Economic Research Service using data from USDA's National Household Food Acquisition and Purchase Survey.

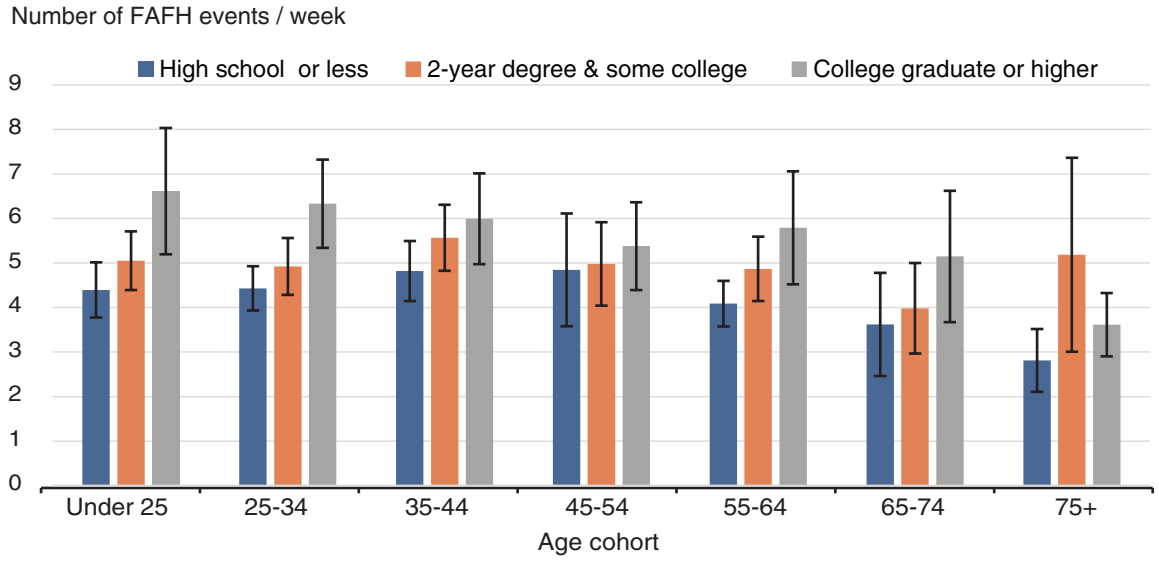
[37]Poverty thresholds are determined by the U. S. Census Bureau (2017).

Education is another indicator of socioeconomic status (SES). Highly educated individuals are more likely to have higher earnings and thus more discretionary income to spend on FAFH, possibly leading to more FAFH consumption (BLS, 2017). There is a consistent upward trend in the frequency of FAFH acquisitions from the least educated adults to the most, across all age groups except the 75+ group (fig. 5.5). The difference in acquisition rates between adults with a high school education or less and adults who are college graduates or higher is statistically significant for all but the 45-54 and 75+ age groups. A similar upward trend is found for employed versus unemployed adults (fig. 5.6). T-tests determined the differences were statistically significant for all age groups except 65-74 and 75+.[3]

Finally, when comparing adult participants in the Supplemental Nutrition Assistance Program (SNAP) with nonparticipants, SNAP participants acquire FAFH with far less frequency across all age groups (fig. 5.7). This result is consistent with the findings for education level and employment status that also indicate that adults with lower SES eat FAFH less frequently. The differences between SNAP participants and nonparticipants were statistically significant for all but the under 25 and 65-74 age cohorts.

Figure 5.5

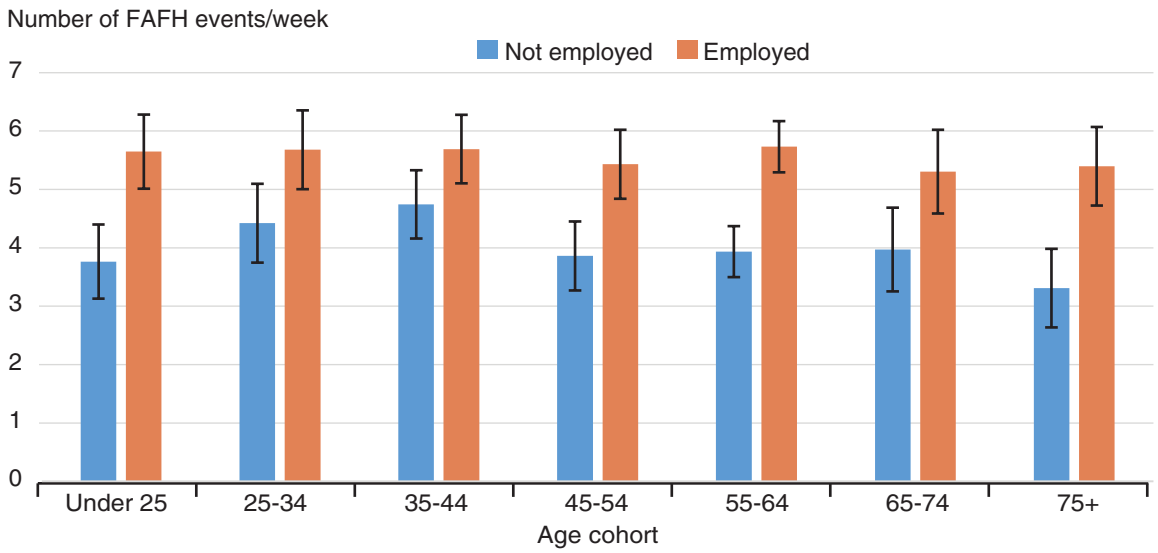
Weekly frequency of FAFH by adults by education



Note: FAFH = food away from home. Education levels are based on the individual's response to his or her highest attained level of education. Vertical error bars represent the standard error of the mean at the 95th percentile and the spread of data for each statistic.
Source: USDA, Economic Research Service using data from USDA's National Household Food Acquisition and Purchase Survey.

Figure 5.6

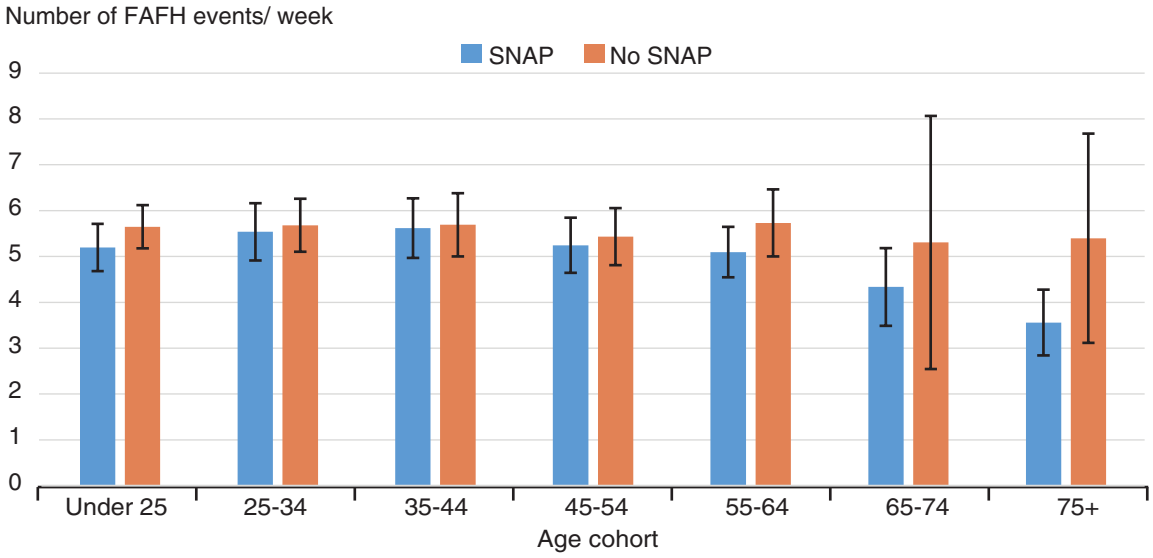
Weekly frequency of FAFH by adults by employment status



Note: FAFH = food away from home. Employment status is determined for the primary responder and corresponds to individual-level employment status, not household-level. Vertical error bars represent the standard error of the mean at the 95th percentile and the spread of data for each statistic.
Source: USDA, Economic Research Service using data from USDA's National Household Food Acquisition and Purchase Survey.

Figure 5.7

Weekly frequency of FAFH by adults by SNAP participation



Note: FAFH = food away from home. SNAP = Supplemental Nutrition Assistance Program. Vertical error bars represent the standard error of the mean at the 95th percentile and the spread of data for each statistic.
Source: USDA, Economic Research Service using data from USDA's National Household Food Acquisition and Purchase Survey.

Marital and Parental Status

Single adults age 44 and younger acquire FAFH with more frequency than their married/partnered counterparts, but this reverses beginning with the 45-54 age group (fig. 5.8). This analysis shows that adults with children in their household acquired FAFH less frequently than those without children cross all age groups (fig. 5.8). However, after testing for statistically significant differences, first between married and single adults and then between adults with and without children, no statistically significant differences between them within age groups are found.

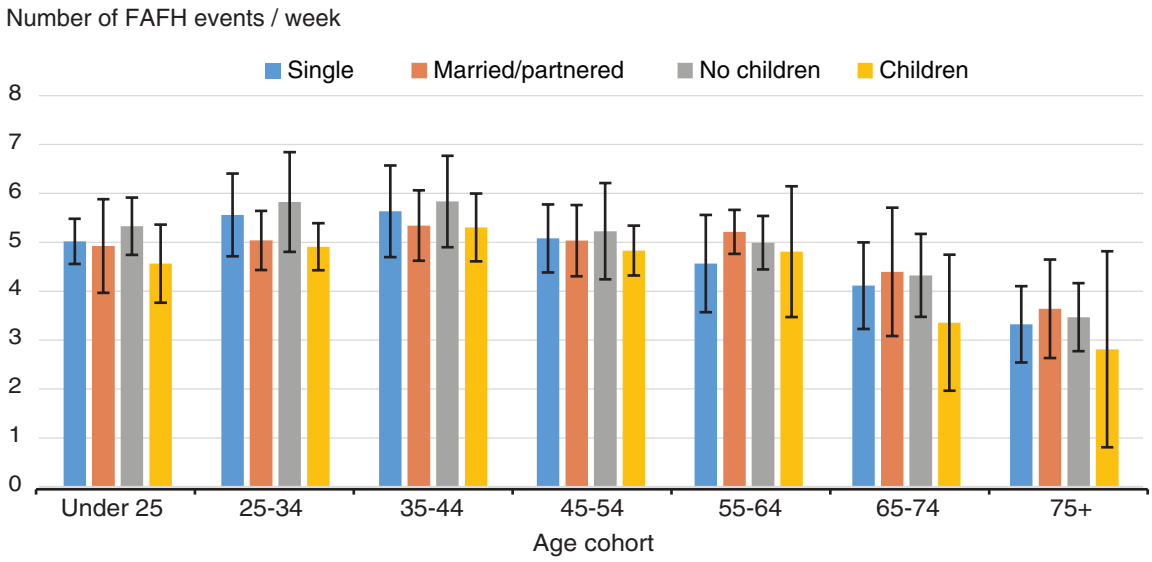
Differences in FAFH Frequency for Households with Children 0-18 Years Old Across Demographic Groups

Instead of 10-year age cohorts, households with children are clustered according to the age of the children in the household: child (0-l0 years of age), youth (11-13), and teen (14-18). At first glance, a general trend can be seen across the three age subgroups, showing that households with youths appear to acquire FAFH with the most frequency (figs. 5.9-5.11).[38]

Much like the adults, there was little variation in the frequency of FAFH acquisitions when disaggregating households with children by race. African-American and Hispanic youth and teens acquire FAFH with greater frequency than non-Hispanic White youth and teens, but these differences were found to be statistically insignificant.

Figure 5.8

Weekly frequency of FAFH by adults by household characteristics

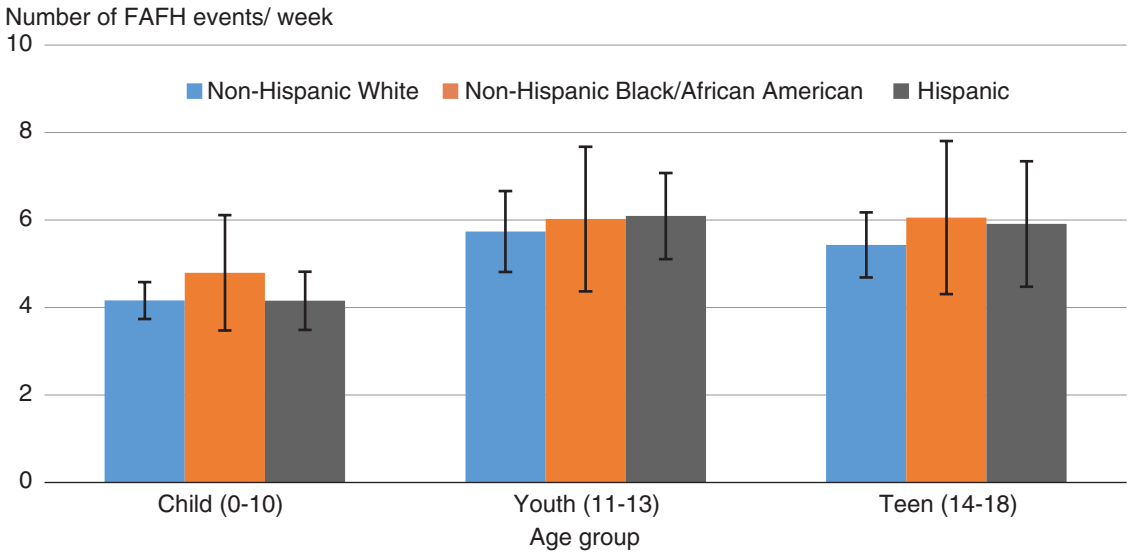


Note: FAFH = food away from home. Vertical error bars represent the standard error of the mean at the 95th percentile and the spread of data for each statistic.
Source: USDA, Economic Research Service using data from USDA's National Household Food Acquisition and Purchase Survey.

[38]Since children below 4 years of age are generally not yet attending school, we were asked for a separate designation for children not of school age.

Figure 5.9

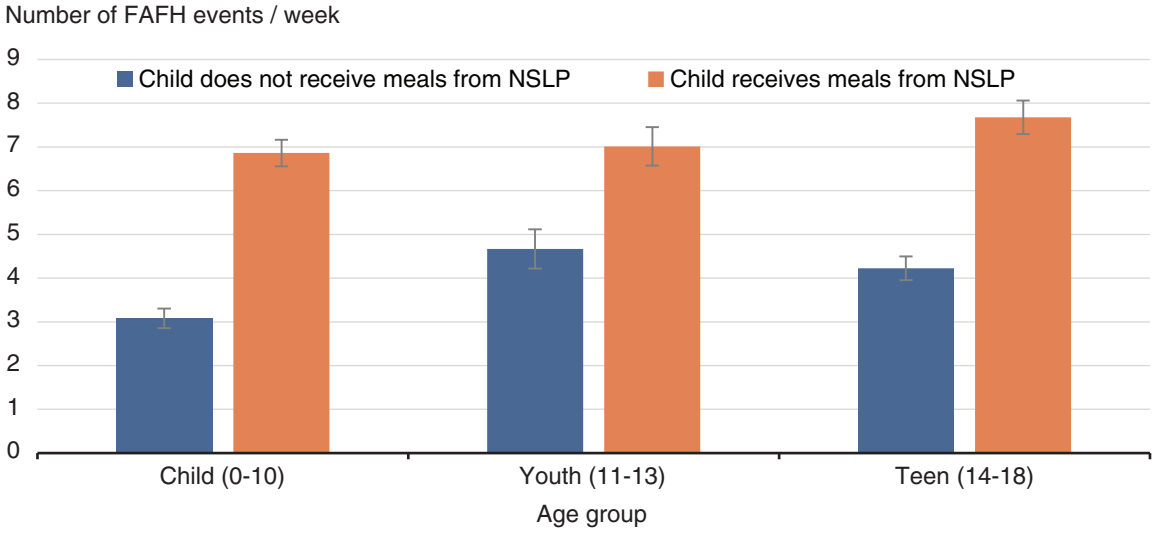
Weekly frequency of FAFH by children by race/ethnicity



Note: FAFH = food away from home. Vertical error bars represent the standard error of the mean at the 95th percentile and the spread of data for each statistic.
Source: USDA, Economic Research Service using data from USDA's National Household Food Acquisition and Purchase Survey .

Figure 5.10a

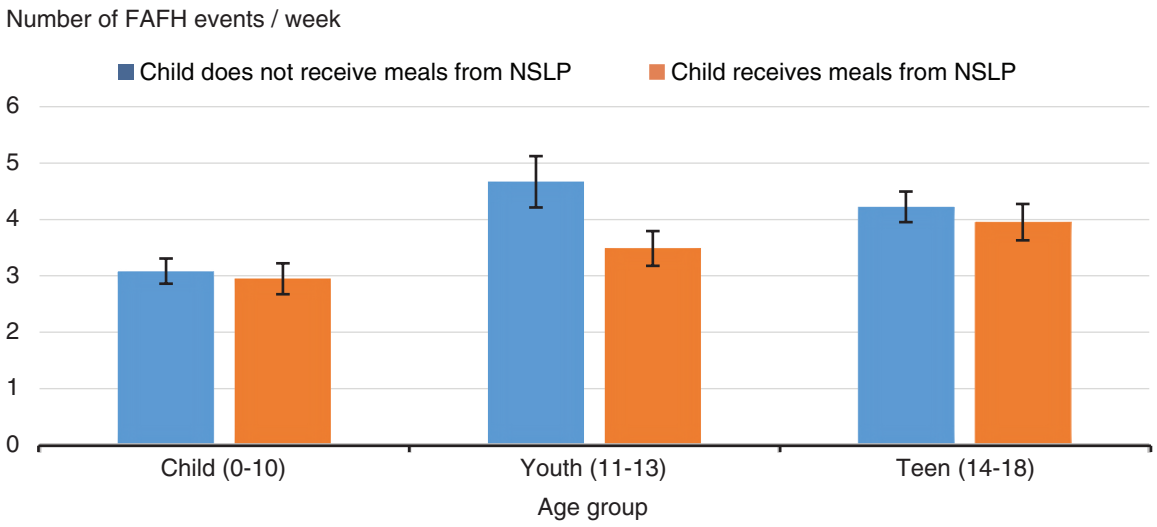
Weekly frequency of FAFH by children participating in the National School Lunch Program (NSLP), including NSLP meals



Note: FAFH = food away from home. Vertical error bars represent the standard error of the mean at the 95th percentile and the spread of data for each statistic.
Source: USDA, Economic Research Service using data from USDA's National Household Food Acquisition and Purchase Survey.

Figure 5.10b

Weekly frequency of FAFH by children participating in the National School Lunch Program (NSLP), including NSLP meals



Note: FAFH = food away from home. Vertical error bars represent the standard error of the mean at the 95th percentile and the spread of data for each statistic.
Source: USDA, Economic Research Service using data from USDA's National Household Food Acquisition and Purchase Survey.

National School Lunch Program

Previous research has analyzed the effect of Federal food assistance programs on shopping behaviors. Tuttle (2016) found that participation in the Supplemental Nutrition Assistance Program (SNAP) reduces expenditures on FAFH. Using the FoodAPS data, ERS researchers examine the correlation between FAFH acquisitions and participation in another Federal food assistance program, the National School Lunch Program (NSLP), among households with children.

Because school lunches must adhere to certain nutritional standards, they may not necessarily be considered typical FAFH fare. To control for this variation, frequency of FAFH acquisitions is calculated for households with children that do and do not receive lunches from the NSLP. Children who receive school lunches from NSLP acquire FAFH much more frequently than children who do not receive lunches from NSLP (fig. 5.11a). T-tests find the differences within each age group statistically significant. However, when NSLP acquisitions are excluded, the differences are negated and, in fact, children who do not receive lunches from NSLP acquire FAFH slightly more frequently, though the differences were statistically significant only for youth (fig. 5.11b). Nonetheless, the results are consistent with the findings of Tuttle (2016) and chapter 4 that households that participate in SNAP allocate a smaller share of their budget to FAFH and consume FAFH less frequently than nonparticipants. The parents of children who do not participate in NSLP are likely to be wealthier and able to afford to consume FAFH on a more regular basis. And since SNAP benefits cannot be used to purchase FAFH, and NSLP offers free or reduced-price lunches, participating households have less incentive than nonparticipants to consume FAFH.

Discussion

Americans are spending more on FAFH than ever before; however, the relationship between increased expenditures and food purchasing behavior is still unclear. Using FoodAPS data, this chapter explores whether and how observed increases in expenditure share (see chapter 3) on FAFH translate into differences in the frequency of FAFH acquisitions among various demographic groups within age cohorts. This analysis shows that 35-44-year-olds acquire FAFH with greater frequency than other adult age cohorts. However, after performing t-tests, these differences were found to be largely statistically insignificant. In addition, there were virtually no differences in frequency of FAFH acquisitions between men and women across all 10-year adult age groups, as well as when disaggregating the data by race, marital, and parental status. Similar insignificance was observed when analyzing FAFH frequency for households with children; there do not seem to be statistically significant differences when dividing the data by race.

The most compelling results were frequency differences by various measures of socioeconomic status (SES). When disaggregating the data by household income as a percentage of the poverty level, education level, employment status, and SNAP participation, adults with measurably higher SES acquired FAFH more frequently compared to their lower SES counterparts. A similar result was found with households with children. After controlling for NSLP meals, households with children who did not receive NSLP meals displayed more frequent FAFH acquisitions, though these differences were statistically insignificant except within the youth age group.

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Appendix table 5.1

Frequency of food-away-from-home (FAFH) events for adults, by age and demographic group

Cohort group by age	Under 25	95% CI		25-34	95% CI		35-44	95% CI		45-54	95% CI		55-64	95% CI	
Number of Individuals	1,093			1,716			1,419			1,396			1,049		
Demographic variables															
Age	5.01	4.60	5.41	5.31	4.78	5.84	5.45	4.86	6.04	5.05	4.50	5.60	4.96	4.45	5.48
Race															
Non-Hispanic White	5.14	4.61	5.64	5.55	4.92	6.23	5.42	4.66	6.20	5.23	4.53	5.87	5.20	4.63	5.77
Non-Hispanic Black/African American	4.56	3.77	5.36	4.50	3.40	5.69	5.19	3.63	6.70	4.13	3.22	5.13	4.00	3.29	4.68
American Indian or Alaska Native	7.63	3.70	9.29	7.05	1.10	11.35	7.76	2.91	8.61	4.82	2.15	6.89	3.63	2.37	7.38
Asian	4.83	3.48	6.26	4.32	3.22	5.42	5.67	3.18	7.95	5.70	3.57	8.66	2.63	1.82	3.45
Hispanic	4.28	3.55	5.00	4.78	4.04	5.52	5.40	4.15	6.66	4.41	3.67	5.14	4.67	3.56	5.79
Sex															
Male	4.92	4.19	5.65	5.45	4.71	6.20	5.41	4.64	6.19	4.98	4.47	5.49	4.87	4.41	5.33
Female	5.08	4.65	5.52	5.19	4.57	5.81	5.49	4.82	6.15	5.12	4.28	5.96	5.04	4.30	5.79
Race-sex															
White, male	5.11	4.06	6.16	5.77	4.86	6.68	5.35	4.42	6.28	5.04	4.38	5.70	4.96	4.30	5.61
Black, male	4.24	3.06	5.43	4.33	2.55	6.11	4.54	3.14	5.94	4.45	2.91	6.00	3.91	2.95	4.86
White, female	5.17	4.27	6.07	5.35	4.57	6.14	5.48	4.66	6.30	5.42	4.42	6.41	5.40	4.53	6.27
Black, female	4.80	3.75	5.85	4.63	3.44	5.82	5.64	3.75	7.53	3.86	2.82	4.90	4.08	2.91	5.25
Body weight classification															
Not overweight	4.91	4.23	5.59	5.45	4.57	6.34	5.64	4.60	6.69	5.37	4.12	6.61	4.94	3.66	6.22
Overweight	5.11	4.44	5.77	4.99	4.19	5.78	5.10	4.36	5.84	5.11	4.51	5.71	5.05	4.11	6.00
Obese	5.32	4.12	6.53	5.51	4.54	6.48	5.73	4.90	6.55	4.78	4.01	5.54	4.91	4.35	5.46
Socioeconomic variables															
Income (All races and genders)															
< 100% of poverty line	3.90	3.34	4.46	4.36	3.50	5.23	4.84	4.12	5.56	4.17	3.44	4.89	4.06	3.14	4.98
100-130% of poverty line	4.65	3.36	5.95	4.68	3.50	5.86	4.75	3.77	5.73	4.21	2.96	5.46	3.91	2.66	5.17
131-167% of poverty line	4.17	3.25	5.08	4.65	3.66	5.64	4.78	3.72	5.84	4.96	3.35	6.57	3.31	1.90	4.71
168-299% of poverty line	5.36	4.38	6.35	4.86	4.13	5.59	5.28	3.87	6.68	4.81	3.85	5.77	4.90	3.87	5.93
≥ 300% of poverty line	5.62	4.82	6.42	6.11	5.16	7.06	5.89	4.89	6.88	5.47	4.65	6.29	5.45	4.68	6.22
Income by race and gender															
< 100% of poverty line	3.33	2.22	4.43	4.68	2.96	6.39	4.62	3.07	6.16	3.71	2.63	4.79	4.23	2.26	6.20
White, male	2.97	1.72	4.22	3.89	1.32	6.47	4.62	1.80	7.43	3.64	2.36	4.93	4.29	1.52	7.06
Black, male	4.80	3.18	6.43	4.19	3.00	5.38	4.85	3.21	6.49	4.79	3.93	5.65	3.89	2.57	5.20
White, female	3.78	2.44	5.13	4.22	3.30	5.13	6.10	3.84	8.36	4.10	2.60	5.60	3.92	1.15	6.69
Black, female															
100-130% of poverty line															
White, male	4.39	2.51	6.26	3.20	2.22	4.18	4.47	2.22	6.72	3.46	1.51	5.41	3.12	2.15	4.09
Black, male	3.64	1.15	6.12	4.91	-0.05	9.87	5.49	0.22	10.76	6.90	4.72	9.07	4.51	0.52	8.49
White, female	4.59	2.26	6.92	4.07	2.31	5.83	4.63	2.99	6.28	3.76	2.10	5.42	4.72	2.44	7.00
Black, female	5.71	3.32	8.09	6.52	4.00	9.04	5.88	2.90	8.86	2.72	1.25	4.18	3.88	2.70	5.05
131-167% of poverty line															
White, male	4.25	2.91	5.59	4.61	3.34	5.88	4.41	2.09	6.73	4.85	2.08	7.62	2.85	0.77	4.92
Black, male	4.08	2.35	5.80	6.38	0.84	11.91	3.46	1.81	5.11	5.81	1.69	9.92	1.41	-0.38	3.19
White, female	4.62	3.04	6.21	4.64	3.28	6.00	4.99	3.62	6.35	4.57	2.81	6.32	3.87	1.60	6.14
Black, female	3.82	0.05	7.58	5.64	1.34	9.95	6.16	3.10	9.22	4.24	-1.88	10.36	3.74	0.74	6.74

Continued—

Cohort group by age	Under 25	95% CI		25-34	95% CI		35-44	95% CI		45-54	95% CI		55-64	95% CI	
168-299% of poverty line															
White, male	5.60	4.26	6.94	5.35	4.20	6.49	5.17	3.28	7.05	5.19	3.32	7.07	4.64	2.60	6.67
Black, male	5.07	2.41	7.72	3.52	0.50	6.54	3.88	2.24	5.52	4.64	1.15	8.13	4.52	-0.05	9.09
White, female	5.01	3.17	6.86	4.65	3.73	5.57	5.07	3.27	6.86	5.20	3.99	6.42	4.95	3.76	6.14
Black, female	6.17	3.62	8.71	3.46	0.61	6.32	4.78	2.00	7.55	3.97	1.60	6.34	6.53	1.03	12.03
≥ 300% of poverty line															
White, male	5.76	3.74	7.78	6.69	5.23	8.15	5.78	4.24	7.31	5.40	4.65	6.16	5.44	4.61	6.27
Black, male	4.54	3.39	5.70	4.14	2.12	6.16	4.70	0.72	8.68	4.64	1.84	7.44	3.19	1.55	4.82
White, female	5.61	3.63	7.60	6.50	5.04	7.96	6.08	4.72	7.44	5.78	4.33	7.23	6.06	4.68	7.44
Black, female	4.67	1.29	8.04	4.94	1.65	8.22	5.47	1.35	9.60	3.83	1.79	5.87	3.68	2.32	5.03
Not employed	3.76	3.13	4.40	4.42	3.75	5.10	4.74	4.16	5.33	3.86	3.27	4.45	3.93	3.50	4.37
Employed	5.65	5.18	6.12	5.68	5.10	6.26	5.69	5.00	6.38	5.43	4.81	6.06	5.73	5.00	6.46
No SNAP	5.19	4.68	5.71	5.54	4.91	6.16	5.62	4.97	6.27	5.24	4.64	5.85	5.10	4.55	5.65
SNAP	4.14	3.25	5.03	4.25	3.72	4.78	4.27	3.48	5.07	3.56	3.06	4.07	3.69	2.82	4.56
Education															
High school or less	4.39	3.77	5.01	4.43	3.93	4.93	4.82	4.15	5.50	4.85	3.58	6.11	4.09	3.57	4.60
2-year degree and some college	5.05	4.39	5.71	4.92	4.28	5.56	5.57	4.83	6.31	4.98	4.04	5.92	4.87	4.15	5.59
College graduate or higher	6.62	5.20	8.03	6.33	5.34	7.32	6.00	4.98	7.01	5.38	4.39	6.37	5.79	4.52	7.06
Household characteristics															
Single	5.02	4.56	5.48	5.56	4.71	6.41	5.63	4.70	6.57	5.08	4.39	5.77	4.57	3.57	5.56
Married/partnered	4.92	3.97	5.88	5.04	4.43	5.64	5.34	4.62	6.06	5.03	4.31	5.76	5.21	4.76	5.66
No children	5.33	4.74	5.91	5.82	4.81	6.84	5.83	4.90	6.77	5.23	4.24	6.21	4.99	4.44	5.54
Children	4.56	3.77	5.36	4.91	4.43	5.39	5.30	4.61	6.00	4.83	4.32	5.34	4.81	3.47	6.15
Lifestyle variables															
< Median commuter time (15 minutes)	5.61	5.14	6.08	5.66	5.05	6.26	5.77	5.09	6.46	5.43	4.80	6.07	5.64	4.88	6.40
≥ Median commuter time (15 minutes)	3.76	3.13	4.39	4.21	3.49	4.92	4.39	3.86	4.93	3.78	3.28	4.29	3.96	3.47	4.45
Not vegetarian	5.03	4.65	5.41	5.31	4.78	5.83	5.42	4.86	5.97	5.04	4.47	5.61	5.04	4.57	5.51
Vegetarian	4.44	1.52	7.35	5.44	2.16	8.73	7.00	2.28	11.71	5.74	0.96	10.53	2.42	1.11	3.73
Not dieting	5.08	4.55	5.61	5.25	4.74	5.77	5.38	4.72	6.03	5.20	4.50	5.90	4.86	4.35	5.37
Dieting	4.43	2.69	6.17	5.70	3.88	7.51	5.76	4.87	6.65	4.55	3.49	5.60	5.19	3.91	6.47
Health status															
Excellent	4.81	3.44	6.18	5.88	4.00	7.76	5.40	4.12	6.68	4.84	3.88	5.80	4.75	3.58	5.93
Fair	4.84	3.53	6.15	5.80	3.88	7.72	5.53	4.63	6.44	5.08	4.14	6.01	4.05	3.40	4.70
Nonsmoker	5.10	4.68	5.52	5.27	4.72	5.83	5.47	4.79	6.15	5.18	4.62	5.75	5.15	4.53	5.77
Smoker	4.73	3.83	5.63	5.42	4.44	6.40	5.39	4.25	6.53	4.59	3.80	5.37	4.09	3.20	4.97
Census region															
Northeast (CT, ME, MA, NH, RI, VT, NJ, NY, PA)	5.07	4.15	5.98	4.79	3.54	6.04	4.74	3.71	5.77	4.74	4.12	5.35	5.06	3.75	6.37
Midwest (IL, IN, MI, OH, WI, IA, KS, MN, MO, NE, ND, SD)	5.11	4.17	6.04	5.40	4.31	6.49	5.36	4.15	6.57	5.69	4.87	6.51	4.63	4.13	5.12
South (DE, DC, FL, GA, MD, NC, SC, VA, WV, AL, KY, MS, TN, AK, LA, OK, TX)	5.17	4.34	6.00	5.64	4.68	6.60	6.02	5.35	6.70	4.58	3.62	5.55	5.50	4.29	6.71
West (AZ, CO, ID, MT, NV, NM, UT, WY, AK, CA, HI, OR, WA)	4.53	3.78	5.29	5.05	4.60	5.50	5.28	4.02	6.55	5.06	3.53	6.58	4.35	3.39	5.32

Continued—

Cohort group by age	65-74	95% CI		75+	95% CI		N	95% CI	
Number of individuals	629			337			6,673		
Demographic variables									
Age	4.28	3.48	5.08	3.44	2.77	4.12	4.96	4.72	5.20
Race									
Non-Hispanic White	4.39	3.45	5.32	3.55	2.82	4.29	5.07	4.78	5.36
Non-Hispanic Black/African American	3.20	1.75	4.57	2.19	1.36	2.93	4.36	3.79	4.92
American Indian or Alaska Native	4.00	0.89	9.83	1.00	-1.71	9.05	6.37	4.39	8.36
Asian	3.09	0.00	6.17	2.79	-2.00	7.59	4.47	3.61	5.33
Hispanic	2.55	1.54	3.56	2.90	1.59	4.22	4.56	4.17	4.94
Sex	4.83	3.53	6.14	3.85	2.87	4.84	5.03	4.71	5.36
Male	3.78	3.16	4.41	3.09	2.38	3.80	4.90	4.64	5.16
Female									
Race-sex									
White, male	5.07	3.57	6.57	3.97	2.93	5.01	5.13	4.71	5.55
Black, male	3.54	1.29	5.78	2.40	1.26	3.55	4.23	3.62	4.85
White, female	3.78	3.10	4.45	3.17	2.39	3.95	5.01	4.75	5.28
Black, female	2.82	1.08	4.56	2.10	1.14	3.06	4.45	3.72	5.18
Weight classification									
Not overweight	4.87	3.11	6.63	3.55	2.71	4.38	5.12	4.68	5.56
Overweight	4.07	3.11	5.02	3.06	2.37	3.75	4.81	4.44	5.19
Obese	4.01	3.13	4.89	3.91	2.25	5.57	4.98	4.72	5.25
Socioeconomic variables									
Income (all races and genders)									
< 100% of poverty line	4.22	2.14	6.29	2.83	1.56	4.10	4.16	3.75	4.58
100-130% of poverty line	3.25	1.92	4.58	2.91	1.20	4.62	4.16	3.58	4.75
131-167% of poverty line	3.20	2.18	4.21	3.38	0.65	6.11	4.21	3.61	4.82
168-299% of poverty line	3.42	2.67	4.17	3.82	2.52	5.13	4.76	4.30	5.23
≥ 300% of poverty line	4.89	3.55	6.23	3.60	2.76	4.45	5.50	5.11	5.89
Income by race and gender									
< 100% of poverty line	7.37	1.77	12.96	2.76	0.98	4.53	4.31	3.49	5.12
White, male	3.19	0.92	5.47	2.77	-2.73	8.27	4.05	3.06	4.72
Black, male	2.87	1.84	3.90	2.96	1.26	4.66	4.32	3.61	4.52
White, female	2.02	0.08	3.95	1.46	0.20	2.72	3.89	3.33	5.24
Black, female									
100-130% of poverty line									
White, male	3.66	1.14	6.19	3.43	-1.68	8.54	4.75	2.65	4.58
Black, male	1.00	-0.99	2.99				4.10	2.80	7.50
White, female	3.16	1.87	4.46	3.03	1.74	4.31	3.61	3.42	4.68
Black, female	1.05	-0.84	2.94	2.17	-1.87	6.21	5.13	2.82	6.27
131-167% of poverty line									
White, male	2.64	1.80	3.47	3.17	-0.71	7.06	4.56	2.99	4.97
Black, male	3.08	-1.17	7.33	1.00	-0.99	2.99	4.27	1.91	6.91
White, female	3.41	2.40	4.42	3.65	0.02	7.28	3.99	3.64	4.94
Black, female	3.16	-0.15	6.46	1.00	1.00	1.00	4.44	2.42	6.58
168-299% of poverty line									
White, male	3.87	2.42	5.32	4.39	2.06	6.72	4.56	4.33	5.52
Black, male	4.31	0.99	7.63	2.29	-0.76	5.33	4.64	2.88	5.63
White, female	3.07	2.64	3.51	3.13	2.45	3.82	4.94	3.96	5.21
Black, female	2.96	-1.36	7.29	4.18	0.30	8.06	4.19	3.56	5.54
≥ 300% of poverty line									
White, male	5.51	3.07	7.95	4.11	3.09	5.14	5.63	4.95	6.30
Black, male	4.45	-3.60	12.50	2.88	-0.13	5.89	4.28	3.03	5.52
White, female	4.47	3.34	5.60	3.21	1.93	4.49	5.69	5.29	6.09
Black, female	6.38	3.26	9.49	1.91	0.09	3.73	4.51	2.66	6.36
Not employed	3.97	3.25	4.69	3.31	2.64	3.98	4.00	3.76	4.24
Employed	5.31	2.54	8.07	5.40	3.11	7.68	5.60	5.26	5.94
No SNAP	4.34	3.49	5.18	3.56	2.84	4.27	5.11	4.84	5.38
SNAP	3.44	2.65	4.22	2.12	1.02	3.21	3.91	3.57	4.25

Continued—

Cohort group by age	65-74	95% CI		75+	95% CI		N	95% CI	
Education									
High school or less	3.62	2.46	4.78	2.81	2.11	3.52	4.29	3.91	4.67
2-year degree and some college	3.98	2.97	5.00	5.19	3.01	7.37	4.96	4.58	5.33
College graduate or higher	5.15	3.67	6.62	3.61	2.90	4.33	7.00	5.18	6.21
Household characteristics									
Single	4.11	3.23	5.00	3.32	2.54	4.10	4.92	4.66	5.19
Married/partnered	4.40	3.08	5.71	3.64	2.63	4.65	5.00	4.65	5.36
No children	4.32	3.47	5.17	3.47	2.77	4.16	4.98	4.63	5.32
Children	3.36	1.97	4.75	2.81	0.81	4.82	4.94	4.69	5.20
Lifestyle variables									
< Median commuter time (15 minutes)	5.34	2.46	8.22	5.40	3.11	7.68	5.59	5.25	5.94
≥ Median commuter time (15 minutes)	3.90	3.17	4.63	3.31	2.64	3.98	3.90	3.65	4.15
Not vegetarian	4.26	3.46	5.06	3.50	2.79	4.22	4.98	4.73	5.22
Vegetarian	4.82	-3.18	12.82	2.20	0.83	3.57	4.57	3.46	5.69
Not dieting	4.50	3.56	5.43	3.29	2.69	3.90	5.01	4.71	5.30
Dieting	3.82	2.85	4.79	3.74	2.37	5.11	4.82	4.35	5.28
Health status									
Excellent	6.13	2.68	9.58	2.84	1.60	4.08	5.12	4.35	5.90
Fair	3.12	2.42	3.82	3.39	0.70	6.08	4.76	4.35	5.17
Nonsmoker	4.20	3.38	5.02	3.39	2.68	4.11	4.99	4.74	5.25
Smoker	4.79	2.52	7.05	3.86	2.54	5.17	4.86	4.37	5.34
Census region									
Northeast (CT, ME, MA, NH, RI, VT, NJ, NY, PA)	4.62	3.27	5.97	3.23	1.96	4.50	4.74	4.39	5.10
Midwest (IL, IN, MI, OH, WI, IA, KS, MN, MO, NE, ND, SD)	4.44	2.94	5.94	3.83	2.60	5.07	5.07	4.73	5.41
South (DE, DC, FL, GA, MD, NC, SC, VA, WV, AL, KY, MS, TN, AK, LA, OK, TX)	4.05	2.27	5.83	3.48	2.28	4.68	5.11	4.48	5.75
West (AZ, CO, ID, MT, NV, NM, UT, WY, AK, CA, HI, OR, WA)	4.00	2.85	5.16	2.63	1.33	3.93	4.73	4.26	5.19

Note: SNAP = Supplemental Nutrition Assistance Program.

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

Appendix table 5.2

Weekly frequency of food-away-from-home events for children, by age and demographic group

Cohort group by age	Child (0-10)	95% CI		Youth (11-13)	95% CI		Teen (14-18)	95% CI		All Individuals	95% CI	
Number of Individuals	1,994			627			967			3,589		
Demographic variables												
Race												
Non-Hispanic White	4.16	3.74	4.58	5.74	4.81	6.66	5.43	4.69	6.18	4.80	4.34	5.25
Non-Hispanic Black/African American	4.80	3.48	6.11	6.02	4.37	7.67	6.06	4.30	7.81	5.43	4.68	6.18
American Indian or Alaska Native	6.14	4.54	7.75	7.47	4.17	10.78	6.56	2.19	10.93	6.60	4.62	8.57
Asian	4.76	2.03	7.50	5.10	0.77	9.44	5.20	-0.39	10.79	4.91	1.75	8.08
Sex												
Boys	4.28	3.77	4.80	5.73	4.51	6.96	5.63	4.71	6.55	4.93	4.41	5.44
Girls	4.34	3.91	4.77	5.95	5.09	6.80	5.65	4.94	6.37	4.98	4.63	5.32
Race-sex												
White, male	3.99	3.44	4.53	5.87	4.12	7.62	5.67	4.56	6.77	4.83	4.21	5.46
Black, male	5.04	3.16	6.93	5.72	3.37	8.08	5.58	3.84	7.32	5.35	4.21	6.49
White, female	4.30	3.80	4.81	5.62	4.34	6.90	5.18	4.59	5.78	4.76	4.25	5.27
Black, female	4.51	3.25	5.78	6.52	3.91	9.13	6.55	4.60	8.50	5.52	4.75	6.29
Body weight classification												
Not overweight	4.41	3.74	5.08	5.72	4.94	6.51	5.51	4.74	6.27	5.06	4.56	5.55
Overweight	3.84	2.94	4.74	5.84	4.54	7.14	6.22	4.86	7.58	5.11	4.30	5.92
Obese	4.39	3.74	5.05	6.85	4.98	8.72	5.45	4.26	6.64	4.95	4.40	5.49
Body weight classification, male												
Not overweight	4.38	3.38	5.38	5.64	4.40	6.88	5.57	4.50	6.64	5.05	4.37	5.73
Overweight	3.99	2.58	5.39	6.25	3.88	8.61	5.74	3.78	7.69	5.10	3.82	6.39
Obese	4.40	3.53	5.27	6.56	3.93	9.19	5.56	3.62	7.49	5.00	4.17	5.82
Body weight classification, female												
Not overweight	4.44	3.79	5.09	5.79	4.69	6.89	5.45	4.71	6.18	5.06	4.58	5.54
Overweight	3.70	2.66	4.74	5.51	4.31	6.70	6.80	5.01	8.59	5.13	4.24	6.01
Obese	4.39	3.43	5.35	7.47	3.40	11.54	5.28	4.14	6.42	4.87	3.96	5.79
Socioeconomic variables												
Income by race and gender												
< 100% of poverty line												
White, male	3.79	2.81	4.76	4.92	3.90	5.95	4.91	3.39	6.43	4.34	3.65	5.04
Black, male	3.91	2.43	5.39	7.00	5.00	9.00	5.31	3.98	6.64	5.01	3.73	6.30
White, female	4.32	3.22	5.42	5.09	3.57	6.60	4.23	3.12	5.34	4.47	3.63	5.30
Black, female	5.06	2.93	7.20	5.66	0.53	10.78	4.61	2.09	7.13	5.01	3.67	6.35
100-130% of poverty line												
White, male	4.15	2.78	5.51	4.42	2.24	6.61	6.86	4.88	8.84	4.69	3.54	5.85
Black, male	5.11	3.39	6.83	7.03	-0.91	14.96	7.24	3.22	11.25	6.00	3.09	8.90
White, female	4.57	1.61	7.54	6.11	3.26	8.96	6.49	3.79	9.20	5.37	3.65	7.10
Black, female	5.22	2.51	7.93	9.01	1.69	16.33	8.92	6.47	11.38	7.00	4.82	9.17
131-167% of poverty line												
White, male	3.86	3.04	4.69	5.88	3.72	8.04	5.47	3.22	7.72	4.73	3.72	5.74
Black, male	4.63	1.55	7.72	6.59	2.15	11.03	6.53	3.30	9.77	5.31	2.62	8.01
White, female	3.88	2.11	5.65	3.71	1.39	6.04	6.61	3.75	9.46	4.66	3.45	5.87
Black, female	4.31	1.05	7.57	6.66	3.28	10.04	7.24	1.64	12.83	5.43	3.43	7.44
168 299% of poverty line												
White, male	3.85	3.12	4.58	5.72	2.31	9.12	5.48	3.17	7.79	4.60	3.32	5.87
Black, male	9.34	2.96	15.73	4.20	0.09	8.31	7.40	5.50	9.30	8.09	3.57	12.61
White, female	4.25	3.37	5.14	6.39	4.18	8.60	5.38	3.79	6.97	4.93	4.00	5.85
Black, female	3.82	1.03	6.61	5.73	4.54	6.91	7.14	3.79	10.49	4.76	2.88	6.65

Continued—

Cohort group by age	Child (0-10)	95% CI		Youth (11-13)	95% CI		Teen (14-18)	95% CI		All Individuals	95% CI	
≥ 300% of poverty line												
White, male	4.23	2.64	5.83	6.93	3.91	9.94	6.06	4.59	7.53	5.33	4.25	6.40
Black, male	2.99	0.61	5.38	3.84	-1.89	9.57	5.08	1.55	8.61	4.20	2.34	6.06
White, female	4.37	3.28	5.45	5.66	3.50	7.82	4.91	3.97	5.85	4.69	3.71	5.67
Black, female	3.09	2.35	3.83	7.08	1.29	12.88	7.04	2.03	12.05	6.08	3.42	8.74
No SNAP	4.34	3.95	4.73	5.83	4.90	6.76	5.72	4.90	6.55	5.01	4.61	5.41
SNAP	4.23	3.65	4.80	5.89	4.78	7.01	5.23	4.40	6.06	4.73	4.31	5.15
Schooling												
Grade school or less										4.31	3.95	4.67
Middle school										5.84	5.15	6.53
High school										5.64	4.92	6.36
NSLP events included in FAFH tally												
Child does not receive meals from NSLP	3.08	2.63	3.53	4.67	3.76	5.58	4.22	3.68	4.76	3.61	3.30	3.92
Child receives meals from NSLP	6.86	6.25	7.47	7.01	6.13	7.89	7.68	6.91	8.44	7.14	6.75	7.54
NSLP events not included in FAFH tally												
Child does not receive meals from NSLP	3.08	2.63	3.53	4.67	3.76	5.58	4.22	3.68	4.76	3.61	3.30	3.92
Child receives meals from NSLP	2.95	2.40	3.50	3.49	2.87	4.11	3.95	3.30	4.60	3.42	3.10	3.73
Lifestyle variables												
Not vegetarian	4.31	3.95	4.68	5.89	5.18	6.60	5.64	4.90	6.38	4.96	4.61	5.30
Vegetarian	4.25	2.17	6.34	3.52	0.28	6.76	5.60	2.65	8.55	4.70	3.48	5.91
Not dieting	4.30	3.93	4.67	5.89	5.20	6.59	5.65	4.91	6.39	4.95	4.59	5.31
Dieting	4.77	3.06	6.48	4.64	1.94	7.34	5.43	3.50	7.36	4.97	3.89	6.06
Census region												
Northeast (CT, ME, MA, NH, RI, VT, NJ, NY, PA)	4.57	3.52	5.62	4.79	3.46	6.12	5.51	4.75	6.26	4.89	4.39	5.40
Midwest (IL, IN, MI, OH, WI, IA, KS, MN, MO, NE, ND, SD)	4.46	3.75	5.16	5.94	4.78	7.10	5.16	4.13	6.19	4.90	4.27	5.52
South (DE, DC, FL, GA, MD, NC, SC, VA, WV, AL, KY, MS, TN, AK, LA, OK, TX)	4.17	3.62	4.72	6.20	5.04	7.37	6.26	4.75	7.76	5.12	4.35	5.88
West (AZ, CO, ID, MT, NV, NM, UT, WY, AK, CA, HI, OR, WA)	4.12	3.35	4.89	6.06	4.77	7.36	5.38	4.56	6.21	4.79	4.43	5.16

Note: SNAP = Supplemental Nutrition Assistance Program; NSLP = National School Lunch Program.

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

Chapter 6: Evolution of the Food-Away-From-Home Industry: Recent and Emerging Trends

This chapter uses publicly and commercially available data to characterize changes in the supply-side of food away from home (FAFH) from 2000 to 2015. The number of food service establishments operating in the United States between 2000 and 2015 has increased more than 8 percent, and geographic variation in growth is consistent with patterns of rural-urban migration. Roughly 40 percent of these establishments are chains, as defined according to criteria set forth by an U.S. Food and Drug Administration (FDA) ruling on menu calorie labeling.

Chapter 2 outlines the evolution of the supply of food away from home (FAFH) to meet American's demand for fast, convenient food options. The increasingly dominant role of FAFH in Americans' food consumption shapes the food industry and has implications for dietary quality. For instance, the food service industry's general growth as well as the proliferation of certain subsegments is partly a response to these shifts in consumption patterns. However, the influence may go both ways: just as consumer preferences can shape the food industry, so, too, the omnipresence of FAFH outlets may sway consumer preferences (chapter 8). With public policy concerns in mind about how FAFH may affect Americans' diets, this chapter segues from a consumer-focused analysis into profiling changes in the commercial FAFH industry that occurred from 2000 to 2015.

By drawing on both publicly available and proprietary commercial sources, this chapter focuses on changes in industry size and composition, as well as on new trends in menu offerings. First, the findings from this chapter support previously observed trends (Stewart 2011; Pullman and Wu 2012), although this analysis shows more pronounced differences across types of foodservice establishments than earlier research found previously. In 2000-15, the supply of FAFH grew in terms of sales and number of establishments, and the composition and structure of firms changed. Over 630,000 commercial quick-service (QSR) and full-service (FSR) restaurants[39] operated in the United States as of March 2015, more than an 8-percent increase since 2000. Roughly 54 percent of all FAFH establishments in 2015 were QSRs, over 60 percent of which were chains.[40] QSR chains were the fastest growing subsegment of recent years, even growing during the Great Recession and outpacing the number of independent FSRs.[41] Across the country, chain restaurants in both segments constitute roughly 40 percent of all establishments, although their prevalence varies geographically.

Second, the analysis in this chapter documents the recent proliferation of the so-called fast-casual restaurant. Fast-casual restaurants are generally characterized as QSRs that offer mainly counter service, while maintaining an ambiance and food quality similar to FSRs. Industrywide, these restaurants have been seen as creative leaders in the trend toward better meeting consumers' sometimes-competing preferences for healthiness, convenience, and value. In part, because of the

[39]Throughout the report, the terms *fast food*, *limited service,* and *quick service* are used interchangeably to denote restaurants that offer counter service, but do not have wait staff that continually tend to customers. Within this outlet type, *fast-casual* restaurants offer mainly just counter service, but servers may bring food to individual tables. *Full-service* denotes restaurants where wait staff continually serve seated customers throughout their meal.

[40]The definition of restaurant chain is based on the Food and Drug Administration's (FDA) ruling on national restaurant menu labeling standards stemming from the Affordable Care Act of 2010: that is, a restaurant brand is a chain if it has 20 or more establishments. See chapter 10 for a detailed discussion of menu labeling in the United States.

[41]The Great Recession corresponds to the economic downturn of December 2007 to June 2009. See National Bureau of Economic Research for U.S. business cycle dates (online).

emphasis on higher quality ingredients, many consumers perceive fast-casual meals to be healthier than those of other QSRs, although it is unclear whether or not fast-casual meals tend to be higher in calories. Fast casuals were the fastest growing QSR subsegment in terms of numbers of outlets and sales. Constituting an estimated 3.6 percent of all QSRs in 2002, fast casuals made up roughly 10.5 percent of all QSRs nationwide as of 2015.

Third, the analysis shows that, in recent years, much of the growth in FAFH establishments occurred in urban U.S. counties in ways consistent with patterns of urban and rural migration. In many locales with large population increases, the number of QSRs has likewise risen sharply and the number of FSRs, modestly. Rural regions with population declines saw many FSRs close, leaving QSRs to dominate their FAFH options.[42] This shift may have implications for the healthiness of FAFH environments in these regions, as QSRs may tend to offer less nutritious and more calorie-dense food than FSRs do (Binkley, 2008; Lin and Guthrie, 2012; chapter 4).

Data

This chapter draws from several commercial data sources for foodservice location and branded sales information, including NPD ReCount and Euromonitor Passport. Retail sales and prices from publically available data sources like U.S. Census Bureau and the Bureau of Labor Statistics are also used in the analysis.

NPD ReCount

The primary data source tracking the economic geography of FAFH is NPD ReCount, a commercial data set that contains information on nearly all FAFH brick-and-mortar establishments operating in the United States from 2000 to 2015. To collect information on food-service locations, NPD employs a multi-pronged approach that surveys multiple commercially and publicly available sources, including chain directories from company headquarters, restaurants guides and industry magazines, various business lists, as well as Internet and phone verifications. For every outlet conducting business in 2000-15, a record is entered in the dataset at the first observed date the outlet is open. From that time, data collection for each operational establishment occurs on an ongoing semiannual basis and ceases once the establishment closes. NPD ReCount tracks the following relevant variables: firm-level characteristics (such as establishment name), exact geographic location, segment (i.e., quick-service versus full-service), restaurant type (e.g., hamburger, Mexican, etc.), chain membership, open date, and close date (if applicable).[43]

The nature of the data collection presents challenges for capturing a yearly snapshot. NPD semiannually publishes new versions of the ReCount data set, accounting for all open restaurants at the end of every March and September. One issue that arises is a restaurant that appears, for example, for the first time in the data in March 2015 could have opened any time between the end of September 2014 and the end of March 2015: any opening in this time range would be recorded as a March 2015 release. Given that a similar issue exists in tracking restaurants closing, characterizing the supply of restaurants in a given year poses a challenge. Because the March 2015 release is the latest version of

[42]Definitions of rural and urban areas are at the county level and come from the 2003 and 2013 ERS Rural-Urban Continuum Codes.

[43]Note that ReCount may classify some establishments as quick-service that other data sources, such as the U.S. Census County Business Patterns (CPB), classify differently. For example, a specialty food or dessert business that sells items for on-site consumption may be classified as something other than a QSR. The result may be discrepancies in establishment counts dues to classification differences.

ERS's available data, March of each year is used to provide annual snapshots in presenting the state of the FAFH industry.

Another point of consideration in defining variables is how to assign the designation of "chain" to a particular establishment. For this analysis, a chain is defined as a brand of restaurants that operated 20 or more outlets in 2015. This definition is consistent with the language of the FDA ruling on calorie labeling for restaurant menus, which is more relevant for diet and nutrition policies than a definition based on business structure would be.[44] In addition, chains that fit this definition in 2015 were more likely than chains that fit the definition prior years to be covered by any future labeling regulation. Thus, restaurant brands that grew to 20 or more outlets by 2015 (but had fewer prior to then) count as chains, but brands that shrank to fewer than 20 outlets by 2015 do not count as chains (but had more previously).[45] Although the summary of the NPD ReCount data is retrospective, this analytical choice allows for the characterization of the future FAFH landscape.

The geographic variables are used to characterize the spatial distribution of FAFH establishments over time. In particular, the growth in several key segments of foodservice industry (e.g., QSRs, chains) is examined by comparing maps of summary statistics by U.S. counties. The summary statistics include the share of a restaurant subset in a county, the number of outlets per county, and the percentage growth from 2000 to 2015.

The outlet name reported in the NPD ReCount data is used to integrate secondary data sources that include additional information on FAFH establishments. One such source is a binary variable indicating whether or not a particular establishment is a fast-casual restaurant. Over 200 unique foodservice brands in NPD ReCount are labeled as fast casuals using information from the annually published "Top 100 Movers & Shakers" reports from 2009 and from 2011 to 2015 by FastCasual.com. NPD ReCount considers a restaurant to fit the fast-casual subsegment if it "creates a unique value and quality experience, with gourmet-level food or drink, that delivers an interior that wows the guest, all at a price that is driven by value" (FastCasual.com, 2009).[46] This list is likely not exhaustive and excludes non-chains, but it positively identifies many high-profile fast-casual chains.

Euromonitor Passport

Euromonitor Passport provides historical data on the value of consumer food sales by local brand names (e.g., Burger King of Yum! Brands) from 2006 to 2014 for FSRs and QSRs. The dataset includes both private and publicly traded companies, which allows for a full composition of industry sales. These data are used to compute the sales concentration ratios of FAFH brands over time, which involves first constructing an ordinal ranking of firms by sales for a given year. Then, sales for the top four firms are summed, for example, and divided by the total value of sales in the segment in that year.

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[44]The specific language is that a covered outlet has "20 or more locations doing business under the same name (regardless of the type of ownership of the locations) and offering for sale substantially the same menu items." In addition, an FAFH establishment must offer "restaurant-type food," or essentially food for immediate consumption. All businesses included in NPD ReCount fit this criterion. The complete version of the FDA ruling can be found online.

[45]For example, several present-day leaders in the QSR fast-casual subsegment operated a small number of outlets in the early 2000s, and thus, the calorie labeling law would not have applied to them if it was hypothetically enacted then. That these businesses are prolific today means that they have a greater effect on the food environment, health, and nutrition of today's consumers than do businesses that closed many locations. Hence, this analysis tracks over time the types of chains that are available to consumers today.

[46]It is worth noting that one of the original contributors of these reports and founder of FastCasual.com is Paul Barron, who is credited with pioneering the term "fast casual."

In addition, brand names from Passport are merged with unique outlet names in NPD ReCount to obtain the restaurant category (e.g., hamburger, subs/deli/other sandwich, pizza/Italian, Mexican, and other). The restaurant categories used herein do not exactly reflect those in NPD ReCount, and to simplify, some are combined (e.g., "subs" and "other sandwich.") Much like the individual brands, sales concentration ratios for restaurant categories are computed over time.

Publicly Available Sources

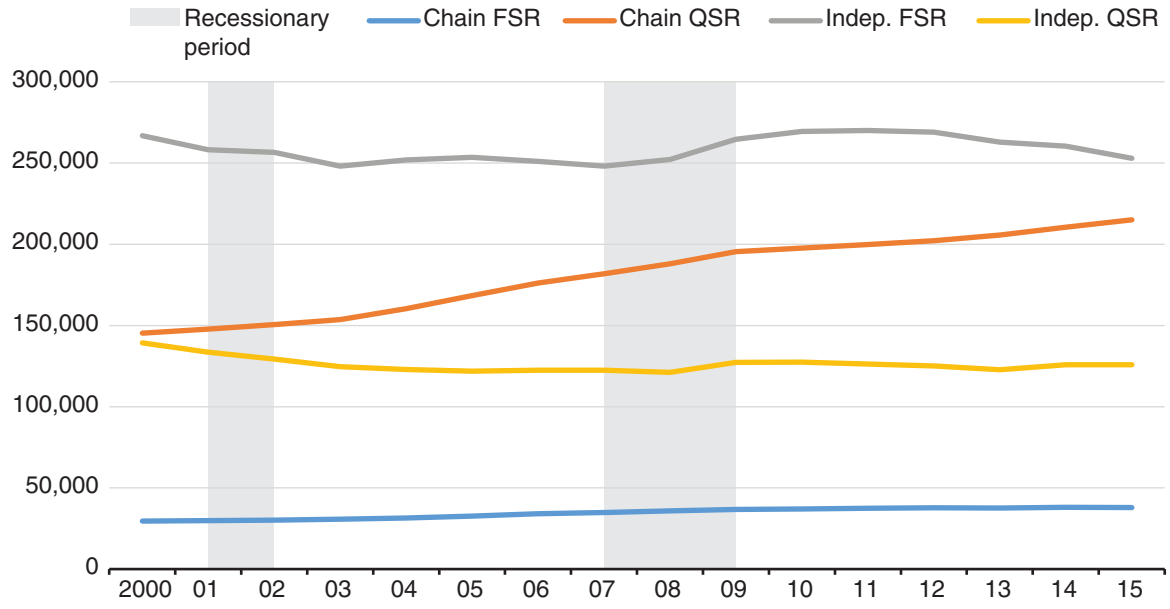
The proprietary data are augmented with a number of publicly available data sources to characterize total sales by segment and food costs faced by restaurant operators. The U.S. Census Bureau's Monthly Retail Trade and Foodservices series and the Quarterly Census of Employment and Earnings provide (unadjusted for seasonal factors) monthly sales in millions of dollars reported in FSR and QSR segments covering 2000 to 2015. Nominal dollars are deflated with the Bureau of Labor Statistics Urban Consumer FAFH Consumer Price Index so that all relevant units are in 2015 dollars.

Market Size and Structure From 2000 to 2015

In 2000-15, both the total value of sales and the number of restaurants operating in the United States grew significantly, extending long observed industry trends, despite two major recessions. Chain QSRs generated most of this growth, while other subsegments stagnated or slightly declined in numbers (fig. 6.1). Therefore, QSRs continue to outnumber FSRs as the majority establishment type, as they have done for over a decade (Stewart, 2011), accounting for roughly 54 percent of all restaurants in the Nation as of 2015. Because QSRs tend to offer less nutritious yet calorie-dense food at low prices (Lin and Guthrie 2012; chapter 3), the trend may mean some food environments saw a decline in the healthiness of available foods.

Figure 6.1

Number of food-away-from-home outlets by segment and chain status, 2000-15



Note: Shaded area indicates recessions. Indep. = independent.
Source: USDA, Economic Research Service calculations from NPD ReCount data.

Between the recession of 2001 and the Great Recession, the FSR segment remained mostly stagnant. FSR numbers rose briefly after 2007: their greatest increase in the study period was roughly 4.7 percent between 2008 and 2009, similar to the QSR segment's growth during this time. This growth may have been driven by increases in FAFH expenditures (especially by higher income Americans), which peaked just prior to the Great Recession (chapter 4).

In contrast with the drop in the number of FSR and QSR establishments in the recession of 2001, the number of establishments in both segments grew during the Great Recession, with FSRs leveling off just after it ended. The apparent delay in the slowdown of new growth is partially an artifact of data collection: the number of restaurants open in 2008 was measured in March of that year, potentially including many establishments beginning to operate before the start of the recession. QSRs continued to show strong growth, albeit at a seemingly lesser rate, perhaps due to Americans shifting their FAFH spending to cheaper fast-food options.[47] FSRs' prevalence dropped over 5 percent since the peak observed in 2009. A notably slow recovery in general employment delayed the return to previous patterns of FAFH consumption for many consumers (chapter 3). Some of the FSRs that strived to stay open through the lean time have since shut down.

QSR and FSR growth between 2000 and 2015 was heterogeneous across the United States (figs. 6.2 and 6.3). The number of QSR establishments expanded in most regions of the country, with the sharpest increases—amounting to more than a 30-percent change in 2000-15—concentrated in the Mid-Atlantic and Southeast (fig. 6.2). Although the greatest growth in these areas occurred in urban counties, QSRs increased in many rural counties as well. The relatively equal number of establishments in both industry segments in 2015, combined with comparatively modest growth in FSRs (fig 6.3), suggests an FAFH landscape increasingly dominated by QSRs.

In the urban centers nationwide, QSRs and FSRs showed strong positive growth. For instance, in metropolitan counties in the Northeastern and Western regions, each of these restaurant segments grew more than 30 percent in 2000-15.[48] Sharper positive growth occurred in several urban regions, such as the Las Vegas metro area—a hotspot for chain and smaller FSR brands seeking publicity by catering to this region's many tourists.[49] Large FSR expansions also took place also in regions just outside of city cores, including in the western suburbs of Chicago; the counties contiguous to Nashville's Davidson County; Loudon County, VA, west of Washington, DC; and many of the urban counties in eastern Texas. This pattern may reflect significant, recent population increases in these regions.

Echoing patterns of rural-urban migration, many rural counties sustained losses in both restaurant segments, especially in the central United States (USDA, ERS, 2016). For instance, in many of the counties in agriculture-dominated Nebraska and Kansas counties, population decreased in 2010-15.

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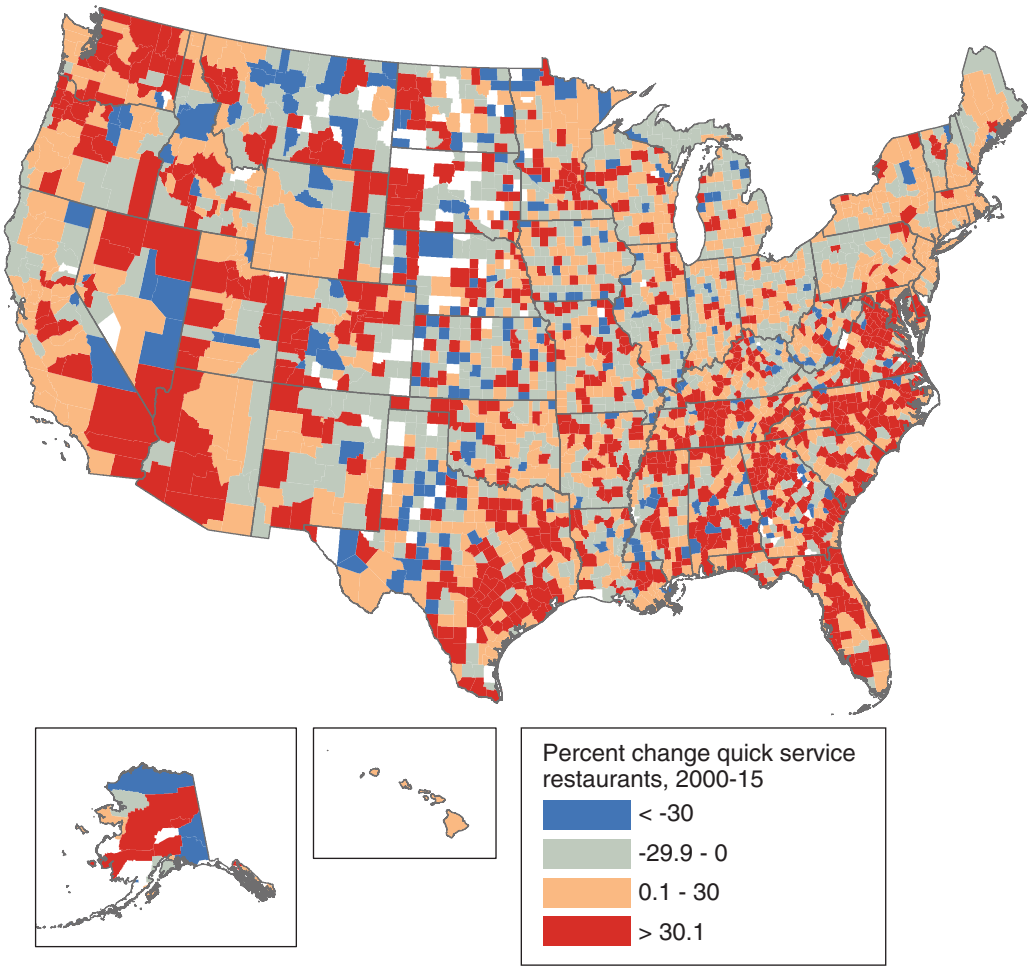
[47]In addition, an observed increase in the diversity (as measured by the predominance of menu categories) of QSRs compared to FSRs in 2000-15 may have helped QSRs retain their attractiveness during this time. The relative number of the top three menu categories of QSRs ("hamburger," "pizza/Italian," and "frozen sweets" in 2000 or "subs" in 2015) fell from 49.3 percent in 2000 to 46.1 percent in 2015. FSRs, on the other hand, had an increase in the relative number of the top three menu categories of FSRs ("Asian-casual dining," "bar and grill," and "family style") from 41.9 percent in 2000 to 47.4 percent in 2015. Although this change was observed over a long time period, it was observed between 2007 and 2010 (i.e., both before and after the Great Recession) suggesting QSR options were increasingly varied.

[48]The definitions of rural and urban areas are at the county level and come from the 2003 and 2013 ERS Rural-Urban Continuum Codes.

[49]The Las Vegas region also experienced high growth in QSRs.

Figure 6.2

Percent growth in quick-service restaurants in 2000-15 by U.S. county



Note: The white areas on the map indicate missing data.
Source: USDA, Economic Research Service calculations from NPD ReCount data.

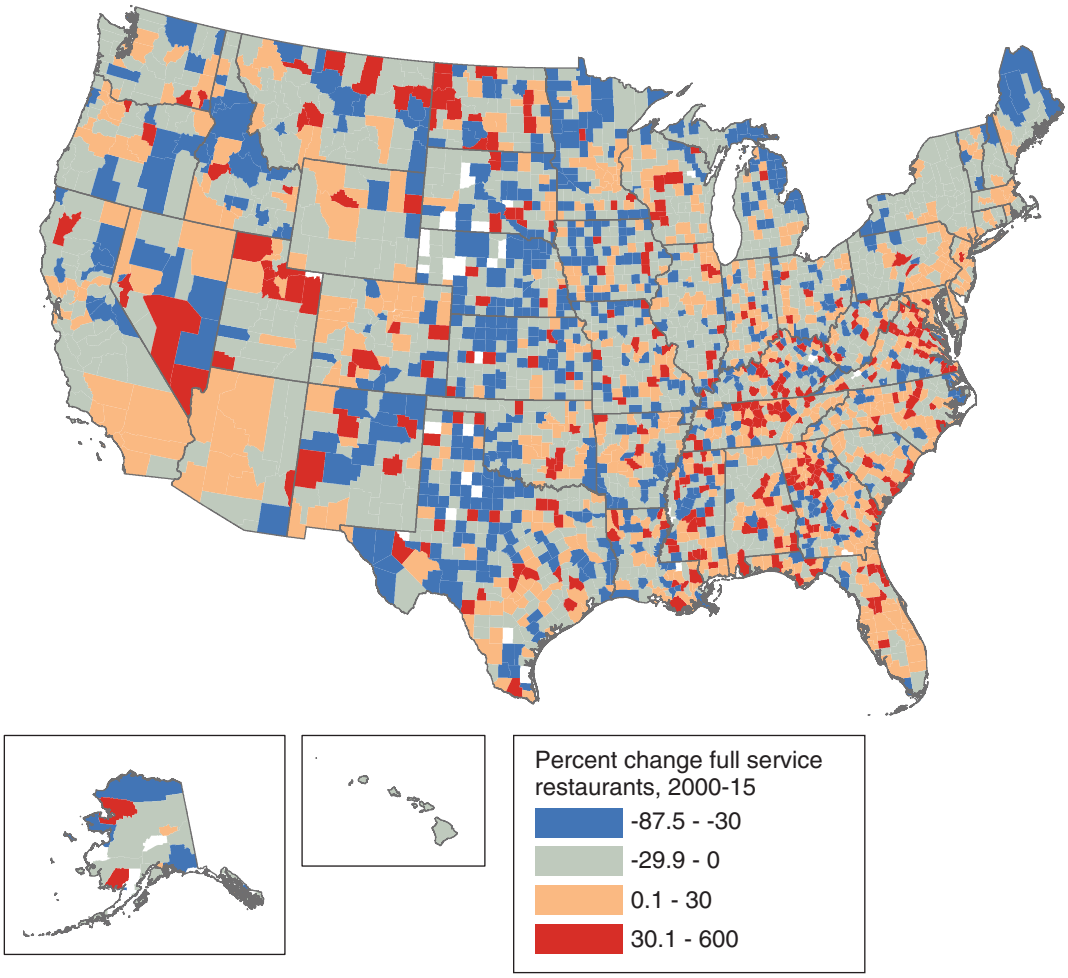
From 2000 to 2015, the total number of restaurants (FSRs and QSRs) fell 30 to 87.5 percent in these counties.

However, migration patterns and restaurant growth rates did not parallel each other in all regions. For some regions, such as rural counties in southern Texas and central Tennessee, population and restaurant growth rates did mirror each other: both increased. On the other hand (as a counterexample), much of Wyoming and western Montana saw net population increases, but FSR numbers dropped steeply in many Wyoming and Montana counties—although some counties did have significant positive growth in QSRs, even while losing restaurants overall. Many of the counties with significant population increases were primarily economically engaged in mining, including coal, which saw significant increases in employment in 2000-15.[50]

[50]ERS county typology codes are used to determine a county's primary industry. According to Bureau of Labor Statistics's Quarterly Census of Employment and Wages, employment levels for coal mining (2012 North American Industry Classification System code: 2121) grew by 30 percent in Wyoming and 54.5 percent in Montana, statewide, in 2005-14.

Figure 6.3

Percent growth in full-service restaurants in 2000-15 by U.S. county

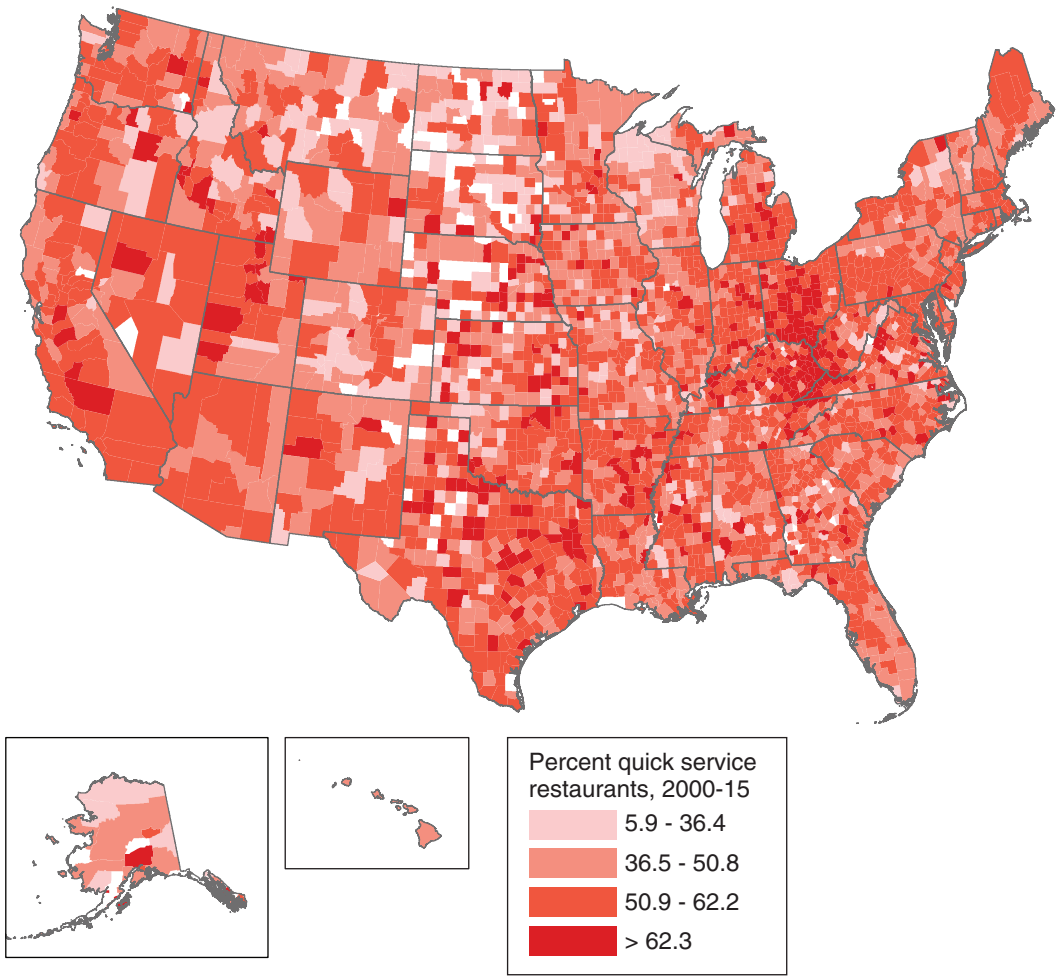


The white areas on the map indicate missing data.
Source: USDA, Economic Research Service calculations from NPD ReCount data.

In 2015, as a result of the past 15 years of growth, the numbers of QSRs and FSRs were roughly equal in most counties, especially urban counties, although a significant number of counties did not follow this pattern (fig. 6.4). By this time, the restaurant options in many relatively rural counties in the Northern and Southern Central U.S. regions consisted mainly of FSRs. For example, only 1 in 17 restaurants in Buffalo County, WI, was a QSR in 2015. In contrast, QSRs dominated the FAFH landscape in rural Ohio, Kentucky, and West Virginia in 2015. One such county—Lawrence County, KY—over 80 percent of its 26 observed restaurants were QSRs, which included mostly chain hamburger restaurants and both chain and independent pizza restaurants. However, despite the relative dominance of QSRs in rural America, the number of QSRs per capita in rural America is well below their prevalence in urban areas (fig. 6.5).

Figure 6.4

Share of quick-service restaurants among all restaurants in 2015 by U.S. county



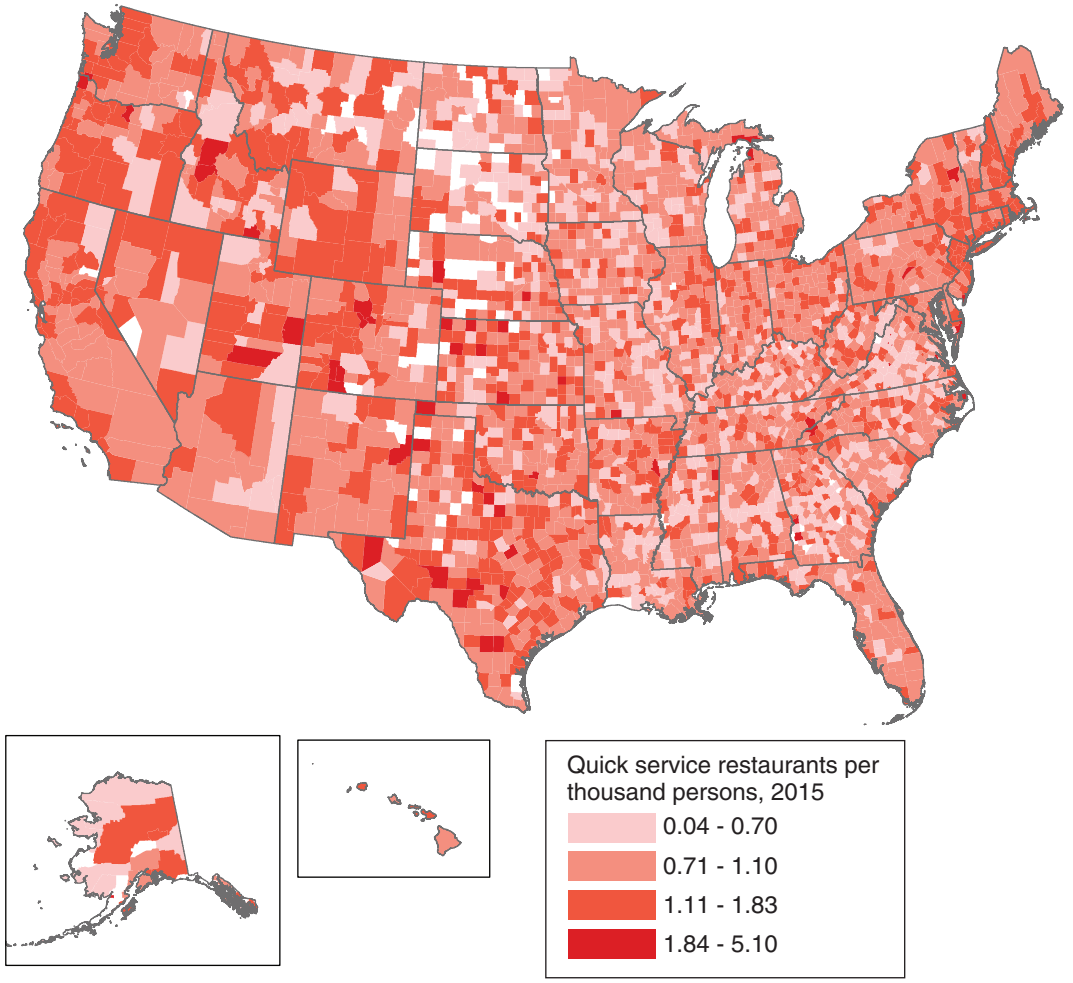
The white areas on the map indicate missing data.
Source: USDA, Economic Research Service calculations from NPD ReCount data.

Growth of Chain Restaurants

In 2015, chain outlets (defined as operating 20 or more outlets), including FSRs and QSRs, accounted for over 250,000 restaurants nationwide, or roughly 40 percent. This represents a 44.7-percent increase from 2000, when chains were roughly 30.1 percent of all FAFH outlets. The QSR sector was mainly responsible for the rise of chains (fig. 6.1). In recent years, the prevalence of the chain-QSR subsegment has approached that of the long-predominant independent-FSR subsegment. Chain FSRs, on the other hand, have remained relatively stagnant. A few possible reasons that most of the new chain outlets have been QSRs include the following: (1) many QSRs are franchised and require significantly less start-up capital than FSRs require; (2) QSRs comprise the quickly growing fast-casual subsegment, which contains many large chains; and (3) few FSR brands operate more than 1 restaurant, let alone 20.

Figure 6.5

Number of quick-service restaurants per 1,000 persons in 2015 by U.S. county



The white areas on the map indicate missing data.
Source: USDA, Economic Research Service calculations from NPD ReCount data.

In some regions of the country, independents tended to overshadow chains (fig. 6.6). For example, in 2015, chains constituted at most 35.4 percent of FAFH establishments in the majority of counties in the Northeast. New York City was a case in point. Given the city's small share of restaurants (relative to the rest of the country) that met the Federal regulatory definition of a chain, New York's support for calorie labeling regulations was somewhat unexpected.[51] As of 2015, New York City's share of chain restaurants that would be affected by Federal calorie labeling laws was 14 to 24.4 percent, depending on the specific borough.[52]

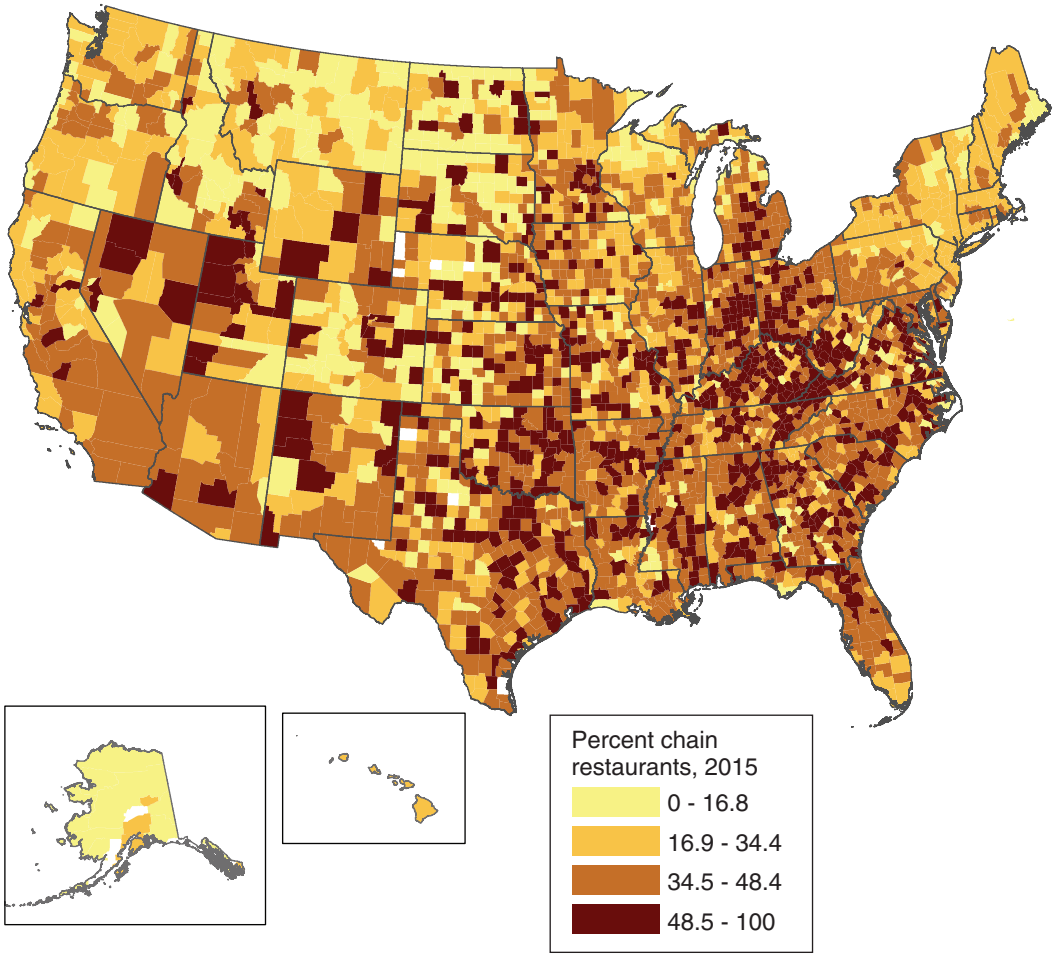
Yet, in many U.S. regions, the restaurant landscape comprises mostly chains, especially in the South, Midwest, and West, where at least 50 percent of the restaurants are chains under the FDA definition.

[51]A higher share were affected under current standing New York City law, which considers a brand with 15 outlets to be chain, rather than the federally mandated 20.

[52]The estimated 2015 shares of chain restaurants in all five counties that make up New York City were 14 percent in Kings County (Brooklyn), 14.9 percent in New York County (Manhattan), 19.2 percent in Bronx County (Bronx), 19.3 percent in Queens County (Queens), and 24.4 percent in Richmond County (Staten Island).

Figure 6.6

Share of chain restaurants among all restaurants in 2000-15 by U.S. county



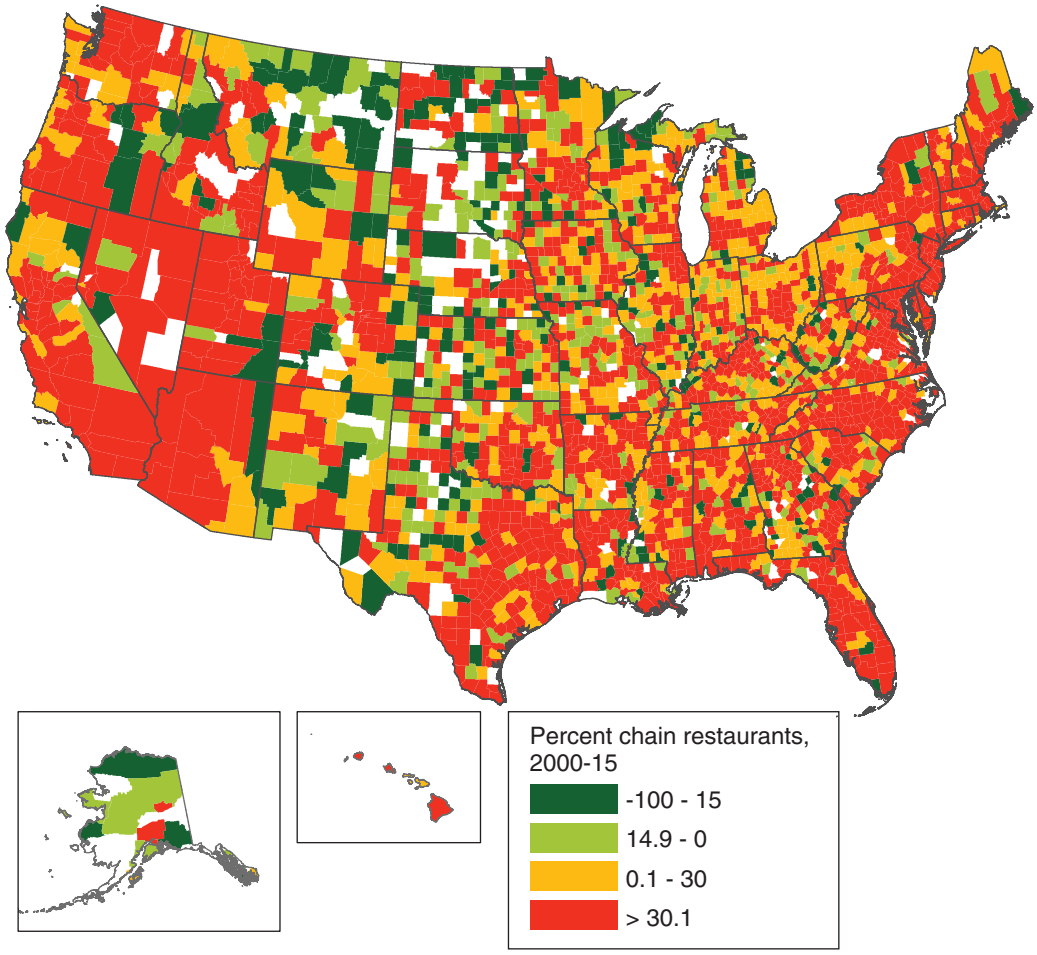
The white areas on the map indicate missing data.
Source: USDA, Economic Research Service calculations from NPD ReCount data.

This disparity suggest that any impact of the impending FDA menu-labeling regulations (requiring calorie counts) may be felt unevenly in consumers from different regions across the country. Notably, many of the chain-dominated regions also experience some of the country's highest rates of obesity. Hence, if the new calorie-count menu labels prompt consumers to consume less calorie-dense food, then these chain-dominated regions may reap significant improvements in public health outcomes. Chapter 10 discusses the evidence to date on how consumers have responded to menu labeling.

Despite the overall surge in growth of chains in 2000-15, restaurants in the relatively chain-free Northeast grew more than many chain-dominated regions grew in that period (fig. 6.7). The relatively high share of independent operators in these areas may be explained by the dense concentrations of people with higher incomes, who are the typical FSR customers (chapter 8) and by the fact that most FSRs are not chains. However, the higher FAFH spending of higher income consumers across all restaurant segments likely supports the expansion of chains in the Northeast, as well as in other urban regions. For example, although QSRs form a small share of New York City restaurants, the number of chains per capita is similar to that of most other U.S. regions (fig. 6.8). Nevertheless, the effect of Federal calorie labeling laws will be limited by the healthiness of the food offerings of the available chains, as well as by regional variations in tastes and eating habits.

Figure 6.7

Percent growth in chain restaurants in 2000-15 by U.S. county



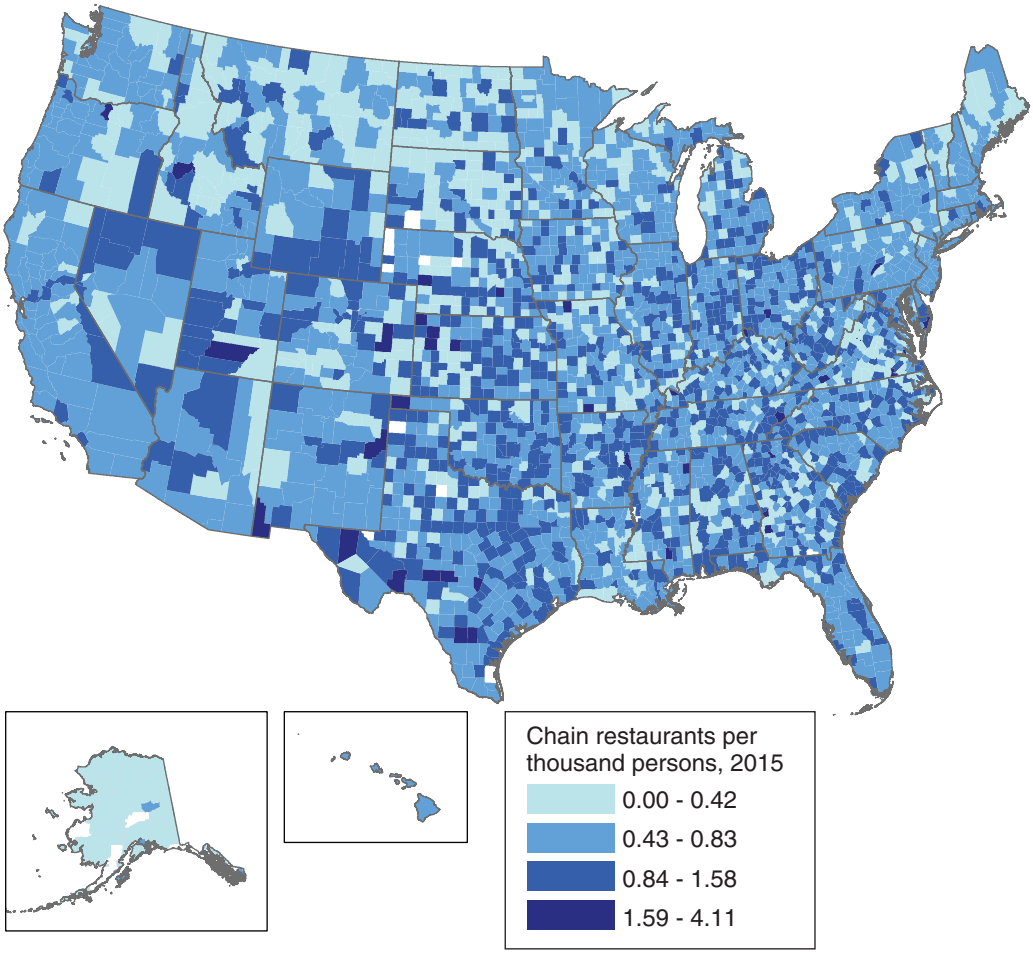
The white areas on the map indicate missing data.
Source: USDA, Economic Research Service calculations from NPD ReCount data.

Emergence of New Foodservice Subsegments

The past decade also saw the emergence of several unconventional restaurant subsegments, including one of the most prolific: the "fast casual." Although no formal industry definition exists, a fast-casual restaurant can be loosely defined as a hybrid of QSR and FSR restaurants. QSRs offer mainly counter service (instead of servers taking orders), convenience (e.g., food prepared quickly in assembly line format), and lower prices than FSRs. However, fast casuals retain FSRs' perceived higher quality of menu offerings and ingredients, as well as FSRs' ambiance. The fast-casual trend synchs with larger consumer-driven trends toward higher quality and potentially healthier menu items offered at relatively low prices. Nonetheless, recently, the nutritional value of fast-casual menu offerings has been called into question, with evidence that fast-casual meals contain more calories than fast-food meals (Schoffman et al., 2016).

Figure 6.8

Number of chain restaurants per 1,000 persons in 2015 by U.S. county



The white areas on the map indicate missing data.
Source: USDA, Economic Research Service calculations from NPD ReCount data.

The idea of fast casuals first emerged, primarily as an industry-specific term, some time in the late 1990s to early 2000s. Much of the early fast-casual market comprised large chains with menus other than the typical QSR fare, including Chipotle Mexican Grill, Noodles & Co., and Panera Bread. Since then, fast casuals have continued to offer options different than the typical QSR menus and consistently grown more quickly than any other FAFH subsegment. Although the sales of fast-casual chains have not yet rivaled those of historic QSR juggernauts (e.g., McDonald's), this segment saw 13 percent and 16 percent in sales growth in 2012 and 2013, respectively (National Restaurant Association, 2015). This growth more than doubled that of the QSR segment as a whole in 2012 and 2013.

As of 2015, fast-casual restaurants made up 10.5 percent of all QSRs, up from less than 5 percent 10 years prior (fig. 6.9), but this growth spurt did not manifest itself equally (or at all) in all regions (fig. 6.10). Urban counties, especially coastal ones, saw a massive expansion of fast casuals, and some metropolitan areas, such as in Washington, DC, and San Francisco, CA, underwent more than a five-fold increase in 2000-15. In many urban areas, a significant share of QSRs are fast casuals, and there are a high number of fast casuals relative to local population (fig. 6.11); in urban areas, this emergence of fast casuals has driven the growth of the QSR segment.

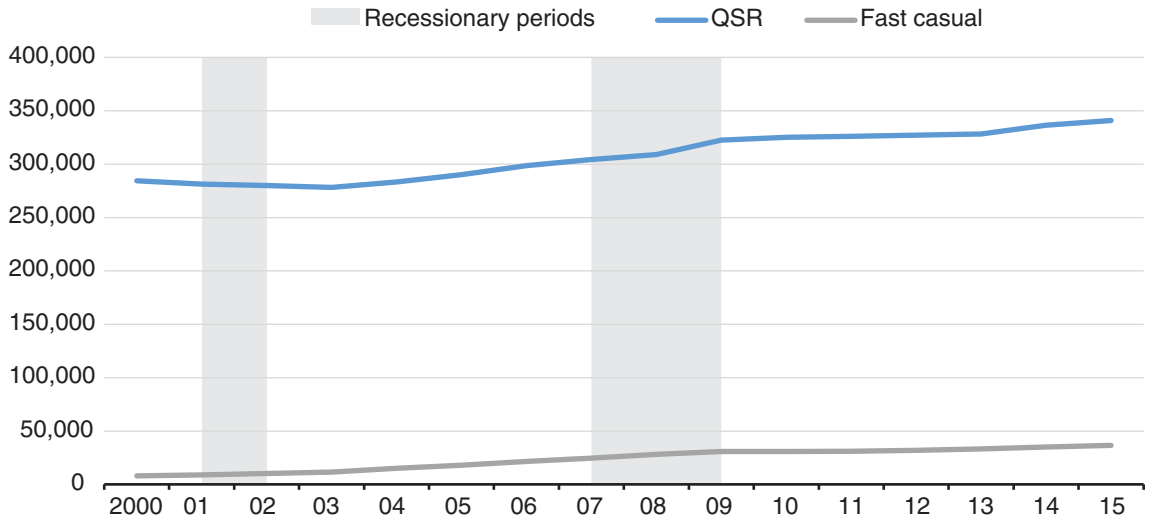
Rural America, on other hand, appears to have been mostly passed over by the fast-casual expansions. The vast majority of rural counties have few if any restaurants, despite the relative dominance of the QSR segment. In fact, in 2015, Los Angeles County contained more than five times as many fast-casual restaurants per capita than most rural U.S. counties. One possible explanation: lower (and shrinking) incomes and, thus, lower FAFH spending in many rural counties have not been able to sustain fast casuals, because despite their purportedly lower prices, fast casuals are not as inexpensive as fast food. Nevertheless, fast-casual numbers did rise in some rural counties. For example, in 2015, some rural counties of western Colorado had fast-casual shares on par with most urban regions. This anomaly may be due to additional revenue from outdoor-recreation tourism in this area, as well as the proximity to metropolitan Colorado, the birthplace of many prominent fast-casual chains such as Chipotle.

The number of mobile foodservice (e.g., food trucks) nearly doubled from 2009 to 2015 (fig. 6.12).[53] Setting themselves apart from food trucks' historical reputation for lower quality, many new mobile operations not only offer low cost staple items, but also specialize in higher quality or gourmet offerings (Crowther, 2013). In this way, while bearing comparatively lower operating and start-up costs than fast casuals, mobile foodservice leverages the same demand for higher quality and varied meals that gave rise to fast casuals (Gold, 2012). These factors may partially explain why the surge in mobile foodservice operators began during the Great Recession, when consumers sought cheaper food options and investments in brick-and-mortar operations were either prohibitively expensive or risky. The popularity of mobile foodservice endured even as consumer spending recovered along with the economy.

[53]Note that mobile foodservice operations do not appear in NPD ReCount, which collects only data on brick-and-mortar commercial establishments.

Figure 6.9

Number of quick-service restaurants (QSRs) and fast-casual restaurants, 2000-15

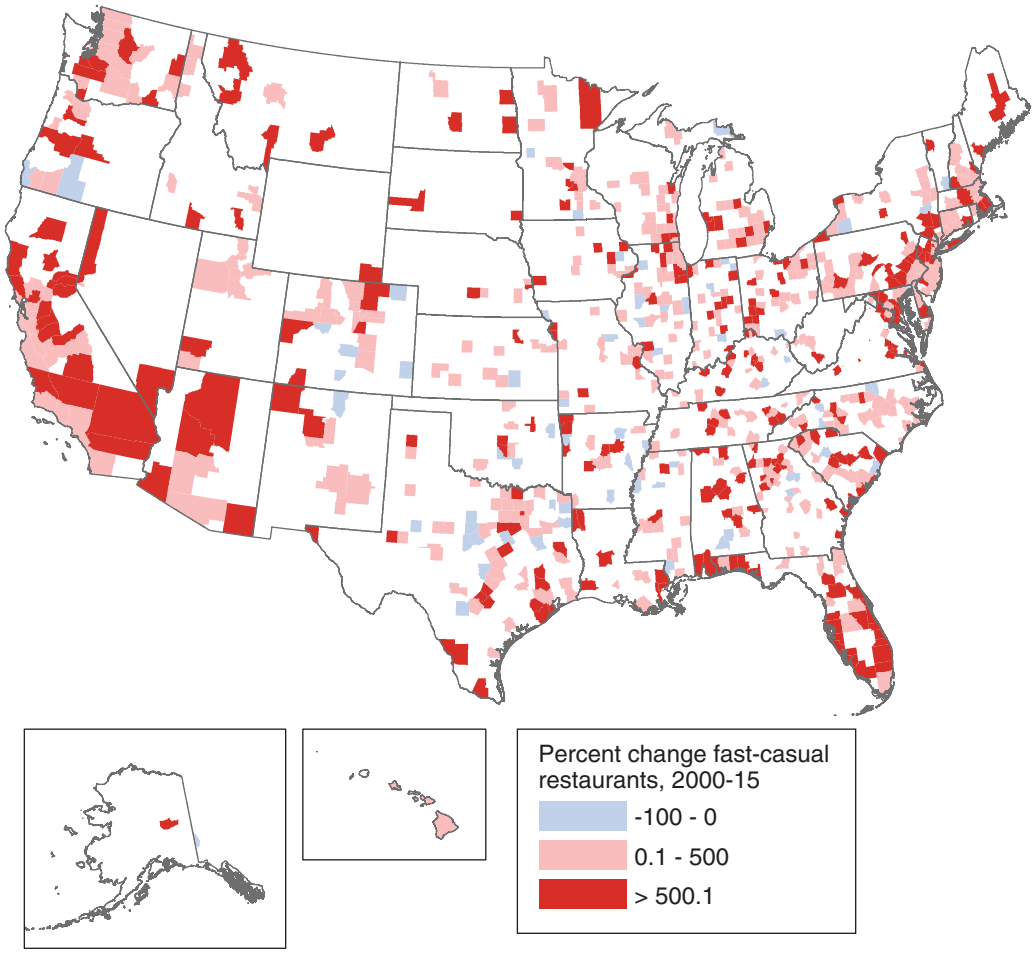


Note: Shaded areas indicate recessions.
Source: U.S. Department of Labor, Bureau of Labor Statistics Quarterly Census of Employment and Wages.

Processed food manufacturers that typically market food-at-home (FAH) products are also tapping into the FAFH market with brand-driven restaurants aimed at presenting products in new ways. For example, Kellogg's most recently opened a restaurant New York City's Times Square that serves the company's ready-to-eat breakfast cereals with the addition of fruits, nuts, spices, and herbs (Black, 2016). Not only does this foray into FAFH allow FAH manufacturers to directly compete with FAFH purveyors in their own marketplace, it also allows FAH companies to test new items. The focus of FAH-brand-driven eatery resembles that of fast casuals and traditional FSRs—i.e., as much about crafting an experiential good as selling food products. The marketing of these "forward integrated" establishments often mimics that of higher quality FSRs, with catchphrases like "artisanal" and "natural" that may soften consumers' perception of products as being massed-produced commodities.

Figure 6.10

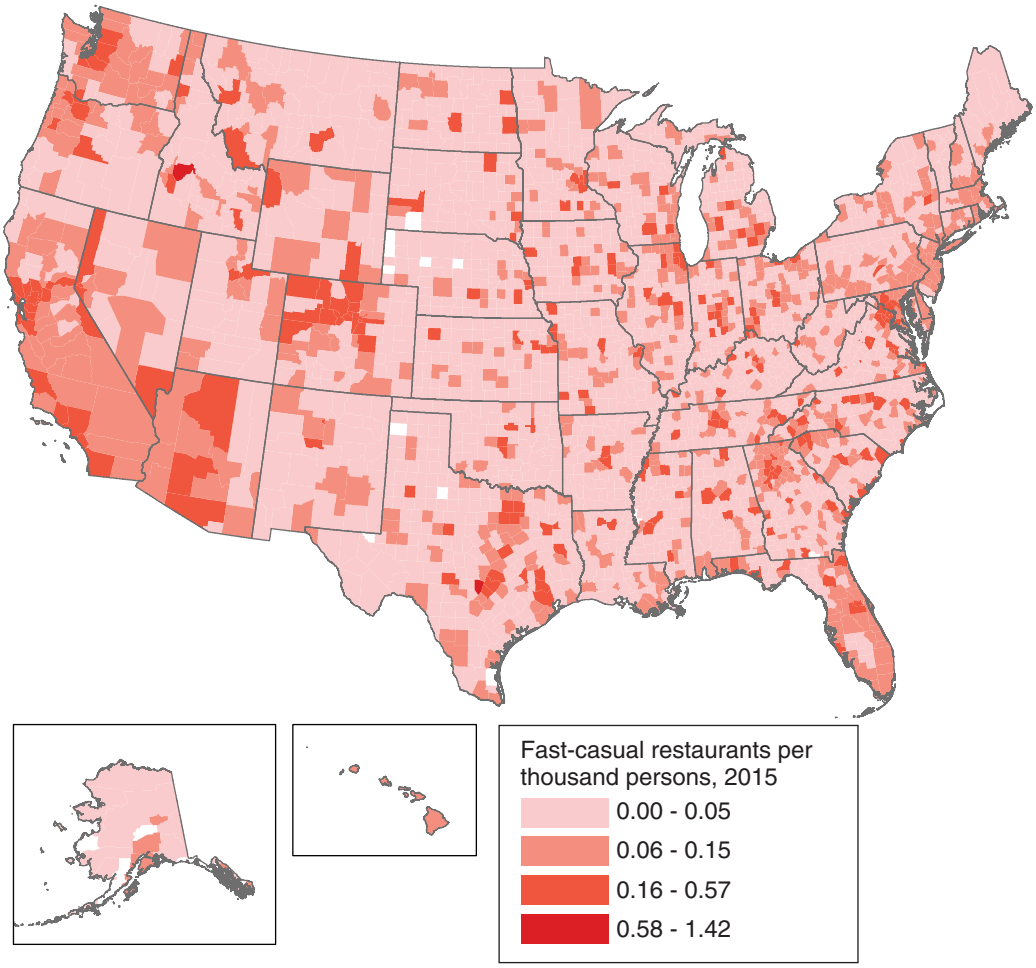
Percent growth in fast-casual restaurants by U.S. county, 2000-15



The white areas on the map indicate missing data.
Source: USDA, Economic Research Service calculations from NPD ReCount data.

Figure 6.11

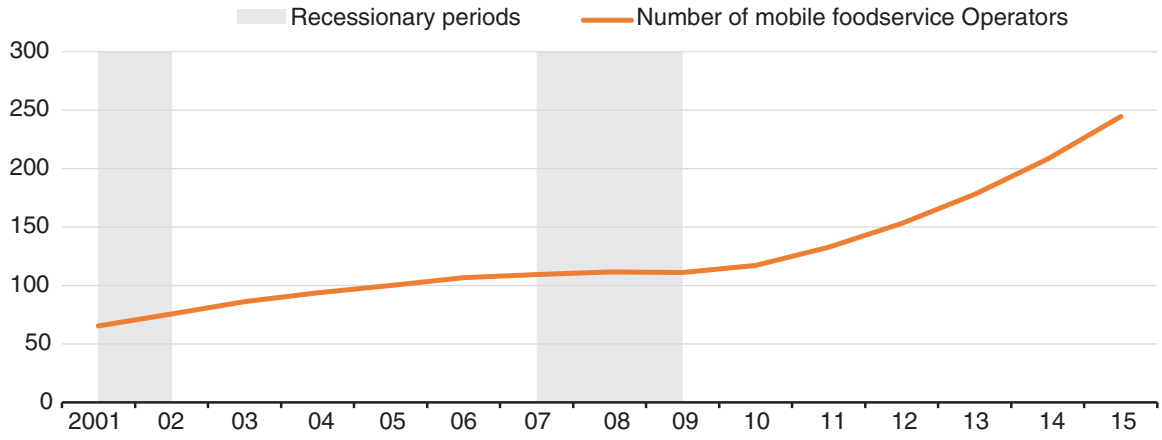
Number of fast-casual restaurants per 1,000 persons in 2015 by U.S. county



The white areas on the map indicate missing data.
Source: USDA, Economic Research Service calculations from NPD ReCount data.

Figure 6.12

Number of mobile foodservice operators in the United States by year



Note: Shaded areas indicate recessions.
Source: U.S. Department of Labor, Bureau of Labor Statistics' Quarterly Census of Employment and Wages, NAICS 72233.

Food-Away-From-Home Sales

From 2010 to 2015, the average monthly real value of FAFH sales climbed to over $20 billion each for QSRs and FSRs (table 6.1). These real sales were up from $16.8 billion for FSRs in 2000 and up from slightly under $16 billion for QSRs 2001, with sales steadily growing in the years preceding the Great Recession years. FAFH sales maintained positive growth even during recessionary period of 2001, albeit than in the 6 years that followed. In addition, growth and levels of FSR sales exceeded those of QSRs in 2000-15.

FSRs' dominance in sales began to wane with the onset of the Great Recession, fulfilling economists' prediction made of the late 1990s that QSR sales would exceed FSR sales (Stewart et al. 2004). During the Great Recession, while FSRs lost the real value of all sales gained in 2005-07, QSR sales grew slightly. QSRs' position strengthened as consumers shifted FAFH consumption to less costly QSRs and the number of QSR outlets grew steadily. With the economic recovery, both sectors returned to previous sales trends with average annual growth over 3 percent each. Both segments now have roughly equal shares of all commercial FAFH expenditures in the United States.

Generally, in 2000-15, sales revenue in the FAFH sector remained diffused across brands in line with the characteristic competitiveness of this industry, despite several high-profile mergers and acquisitions among key brands.[54] In 2005-15, FSR sales revenue remained extremely diffused, with roughly 7 percent of sales revenue going to the top 4 brands and 16 percent going to the top 20 brands. The QSR sector, on the other hand, stayed comparatively more concentrated, with 30 percent of all sales revenue accruing to the top four brand owners (fig. 6.13).

[54]For example, Restaurant Brands International owned by the private equity firm 3G Capital acquired Burger King and Tim Hortons. Both of these brands consistently rank among the top 10 of all QSRs.

Table 6.1

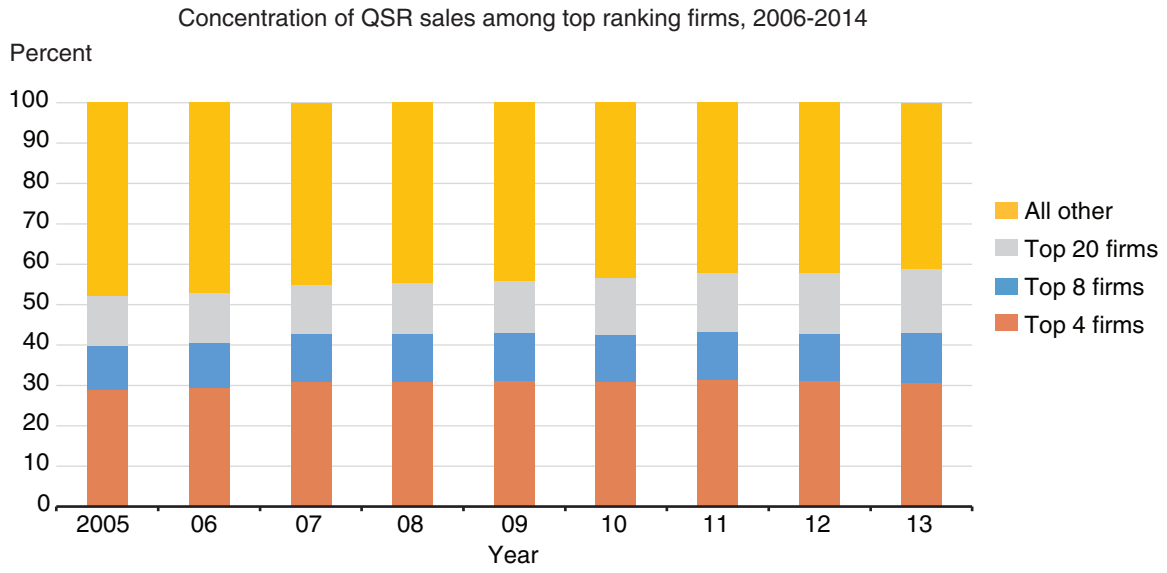
Growth rates of total sales for full-service restaurants (FSRs) and quick-service restaurants (QSRs)

Years	Average annualized growth rate		Average value of monthly sales	
	FSR	QSR	FSR	QSR
	Percent	*Percent*	*Billion $*	*Billion $*
2000-01	1.90	1.04	16.827	15.994
2002-04	3.21	3.52	17.999	16.802
2005-07	2.55	1.50	19.535	18.748
2007-10	-2.33	0.07	19.023	18.833
2011-15	3.77	3.18	20.793	20.629

Source: U.S. Census Bureau Monthly Retail Trade and Foodservices.

Figure 6.13

Concentration of quick-service restaurant (QSR) sales among top-ranking firms, 2006-14



Source: USDA, Economic Research Service calculations from Euromonitor Passport data.

In general, the relative position of dominant brands remained constant in 2006-14 (fig. 6.13).[55] The shares of sales to QSR restaurant categories remained the same. One exception is the share of QSR sales revenue going to the top 20 QSR brands—a share that grew by nearly 10 percent from 2006 to 2014. This rise reflects the growing dominance of fast-casual chains in QSRs. For example, the top fast-casual chains ranked either near 20th place or below in terms of QSR sales share in 2006, but climbed to nearly the top 10 by 2014. For QSR menu categories, the most sales revenue accrued to the fast-food burger market throughout 2006 to 2014 (table 6.2). However, the "hamburger" category's share showed a modest decline, and the shares of the "subs/deli/other sandwich" and "Mexican" categories showed small upticks. This change is attributable to the growth of sales by Panera and Chipotle, the two largest fast-casual chains.

Table 6.2
Concentrations of quick service restaurant sales among top ranking menu categories, 2006-14

Category	2006-08	2009-11	2012-14
		Percent	
Hamburger	44.9	44.4	42.4
Subs/deli/ other sandwich	14.8	16.6	17.6
Pizza/Italian	10.6	10.3	10.5
Mexican	6.6	6.9	7.6
Other	23.1	21.8	22.0

Source: USDA Economic Research Service calculations from Euromonitor Passport data.

[55]That is, one QSR brand (McDonald's) retained its first-ranked position in share of sales throughout 2006-14.

Conclusion

The recent increase in the supply of FAFH is partly driven by the rising dominance of chain QSR restaurants. Growth in QSRs outpaced that of FSRs for most years in 2000-15, which resulted in QSR sales now nearly equaling those of FSRs. As of 2015, well over half of all restaurants were either a QSR, a chain, or both. Most U.S. regions, including the independent-restaurant-heavy Northeast, saw significantly large growth in chain QSRs. With the chain QSR subsegment, hamburger-centric brands accounted for 42.5 to 44.9 percent of all QSR sales in 2006-15.

Along with the strong growth of QSR chains, the emergence of the fast-casual restaurant and large gains in mobile foodservice combined to further expand the QSR market share. Responding to the bar set by fast casuals for perceived healthiness, high quality, and competitive prices, many traditional QSRs were incentivized to improve these value markers in their own outlets. During the Great Recession and subsequent sluggish recovery, fast casuals and other subsegments such as mobile foodservice were able to thrive while many traditional QSRs and FSRs struggled. As of 2015, the fast-casual subsegment alone accounted for roughly 10 percent of all QSRs and overtook many longstanding QSRs in terms of sales. Two large fast-casual chains have even overtaken longstanding traditional QSRs firms in terms of the rankings of sales by chain.

However, these broad industry trends did not manifest uniformly across the country. Growing urban population centers of the United States saw the most growth in commercial FAFH establishments of all types but especially QSR fast casuals. Yet, the restaurant landscape in rural counties told a different story. There, FSRs declined to the point that, by 2015, many rural counties that had been served mainly by FSRs in 2000 came to be served mainly by QSRs. Although QSRs' dominance in rural areas mirrored the rest of the Nation, the rise of the fast-casual subsegment, so pronounced elsewhere, mostly passed over rural America (with several notable exceptions). The general shift from FSRs toward QSRs in rural areas may have health implications insofar as FSRs and QSRs differ in the healthiness of their menus.

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Chapter 7: Impacts on Nutrient Intakes From Increased Food-Away-From-Home Consumption

This chapter examines the growth in consumption of foods prepared away from home (FAFH), the nutritional differences in foods consumed by source, and the implications for Federal efforts to improve the diets of Americans. The analysis finds that, on the whole, FAFH contained more saturated fats and sodium and less calcium, iron, and fiber than FAH, but nutrient composition varied across source of FAFH and over time.

The shift in consumer preferences toward FAFH is driven by numerous factors, including socioeconomic and lifestyle changes (see chapters 3 and 4) and increased availability of FAFH options (see chapters 6 and 8). This chapter examines the nutritional implications of this shift using national data from Federal surveys of Americans' dietary intakes. National food consumption survey data collected from 1977-78 to 2014 are used to compare intakes of selected nutrients by sources to examine the shift in food consumption from food prepared at home and away from home over time.

Observed changes in dietary patterns over time may come from a variety of sources, including an aging U.S. population, the changing racial and ethnic makeup of the U.S. population, and other socioeconomic factors (e.g., single-parent households) that may influence food consumption decisions. The report compares mean dietary patterns over time without statistically testing the differences across survey years or adjusting for changing age, racial, and ethnic composition. Further research would be needed to identify the role of such factors. Despite these limitations, the findings provide information on the role of FAFH in the U.S. diet and the nutritional implications.

The analysis in this chapter finds that the nutritional composition of FAFH across all income levels and all FAFH types (except school food) was consistently lower quality and more caloric than that of FAH. With the exception of school meals and other foods obtained at school (a type of FAFH), FAFH generally contained more saturated fats and sodium, and less calcium, iron, and fiber than FAH. In 2009-12, the fat content of school meals was almost identical to that of FAH (33 percent) while the fat content of fast foods averaged 39 percent. The FAFH share of total average daily energy intake increased from 17 percent in 1977-78 to 34 percent in 2011-12, and consumption of QSR (Quick Service Brand) foods was the largest source of this growth. Consistent with FAFH expenditure patterns discussed in chapters 3 and 4, calories from FAFH sources declined in the most recent economic downturn in 2007-10, but by 2011-12, consumption of FAFH had rebounded. While food from FAFH sources is less healthy compared to most FAH sources, it is not clear whether FAFH consumption is correlated with diminished overall diet quality of Americans. Chapters 8 and 9 discuss in more detail how FAFH consumption contributes to diet quality.

Data and Methods

This analysis uses several federally collected national surveys to track nutrient consumption by source:[56]

- USDA Nationwide Food Consumption Survey (NFCS) 1977-78,
- USDA Continuing Survey of Food Intakes by Individuals (CSFII) 1989-91 and 1994-98, and

[56]Information on USDA surveys can be found at USDA's Agricultural Research Service website. Information on NHANES can be found at the website for the Centers for Disease Control and Prevention.

- The National Health and Nutrition Examination Survey (NHANES) 2003-04, 2005-06, 2007-08, 2009-10, 2011-12, and 2013-14.

These surveys collected information on the types and amounts of foods eaten by respondents, as well as information on where the food was obtained. In keeping with most analyses using national food consumption survey data, respondents under age 2 were excluded. Using this information in conjunction with its nutrient databases, USDA estimated amounts of food energy (calories) and nutrients consumed by individuals.[57] Each survey employed a complex design with stratified sampling to efficiently obtain a large national sample of Americans. Sample weights were calculated to adjust for variable probability of selection and survey nonresponse to yield nationally representative estimates. However, since participation was voluntary, there may have been self-selection bias that was not perfectly corrected by weighting.

Each survey was conducted using the best methodology available at the time. Although each survey drew on the methodology of the previous survey, they were not completely consistent in all measures. The authors have recoded data using consistent food source definitions to better investigate longrun trends in consumption of food prepared away from home (Guthrie et al., 2016).

It should be noted that changes in survey methods—particularly as they pertain to collection methods of food intake data from survey participants—create difficulties in comparing statistical results across time. In particular, earlier surveys (1977-78 and 1989-91) collected 3 consecutive days of dietary intake data—the first day employing the 24-hour recall methodology and the latter days obtaining data from food records kept by respondents. Later surveys employed only the 24-hour recall method and collected data over 2 nonconsecutive days.

To minimize differences that could be attributed to these changes in methodology, only day 1 intake data were used from each survey, which in all cases was collected via 24-hour recall. Other changes, however, may also have had an impact on the data. Most notably, a five-step Automated Multiple-Pass Method (AMPM) designed to improve the completeness of data collection has been employed in NHANES but not in NFCS or CSFII (Raper et al., 2004). Adopting AMPM may have reduced underreporting, resulting in an increase in reported food intake, but the extent of its contribution is unknown.

This analysis examines changes in share of intake from FAH and FAFH sources and changes in nutrient densities associated with those changes over time, rather than changes in absolute amounts, which may mitigate differences that are an artifact of more complete reporting. However, improvements in reporting may have affected some categories of intake or nutrients more than others—for example, probing may result in survey respondents remembering small items like spreads and condiments that could be disproportionately high in sodium or fat. Therefore, the potential impact of underreporting may have been present in the estimates but no attempt was made to adjust for it.

Trends in food energy intake by food source (see box, "Definitions of Food Sources")—FAH and FAFH, with FAFH further disaggregated into restaurant, fast food, school/day care, and other—were estimated using the mean proportion approach (Krebs-Smith et al., 1989). Shares of food energy intake by food source were calculated for each respondent, and then the sample weights were used to calculate the weighted average shares of food energy intake by food source for the U.S. population and for population subgroups, such as children and youth (age 2 to 19) versus adults

[57]USDA nutrient databases are regularly updated to include the best available information on foods consumed. Nevertheless, there may be limitations. For example, some schools serve products (e.g., frozen pizzas) specially formulated for sale to school foodservices that may differ somewhat from standard products.

(age 20 and older) or low income (at or below 185 percent of the Federal poverty level) versus high income (above 185 percent). The mean proportion approach generated the weighted average shares by food source for a representative respondent in the population in question.

This report used the population proportion approach, the recommended method for this analysis, to calculating and comparing nutrient density, defined as nutrients per 1,000 kilocalories, by food source for two periods—1977-78 and 2011-14 (Freedman et al., 2008). Following this method, the weighted total intakes for a given nutrient and kilocalories were calculated for a food source (e.g., FAH, FAFH) among the total population as well as population subgroups. The nutrient densities for total diet, FAH, FAFH, and the four subcategories of FAFH—for the total population as well as for population subgroups—were expressed per 1,000 kilocalories, except for total fat and saturated fat, which were expressed as percent of calories, following the convention of the *Dietary Guidelines for Americans* (USDHHS and USDA, 2015).

To demonstrate, the population proportion approach can be applied in calculating the calcium density of foods obtained at school cafeterias among children. Using the mean proportion method, the weighted sums of calcium and calorie intakes obtained at school cafeterias among children are first calculated; second, the calcium density is calculated as the ratio of total calcium to total calories. The mean proportion method is chosen because, on a given day, some individuals may obtain foods exclusively from either FAH or FAFH. As a result, the mean proportion method (i.e., calculating nutrient density based on the intake of each individual and then averaging intake densities) may generate nutrient density values for the total diet that fall outside the densities for FAH and FAFH. This seemingly counterintuitive result can be prevented by using the population proportion approach (Freedman et al., 2008; Lin et al., 2016).

30-Year Rise in Food Prepared Away From Home Briefly Reversed in 2007-10 and Then Rebounded

The share of calories obtained from FAFH rose from 17.8 percent in 1977-78 to 33.7 percent in 2005-06 (figure 7.1). Increased consumption of fast food had the strongest influence on this trend, with the share of calories obtained from fast food increasing from 5.7 percent in 1977-78 to 15.6 percent in 2005-06. The increase in share of calories from full-service restaurant food, the second-highest source of FAFH, was from 3.2 percent to 9.9 percent.

Between 2007 and 2010, the share of calories obtained away from home briefly dipped to 29.1 percent in 2009-10, while calories obtained from fast food, the leading FAFH source, dropped to 13.2 percent. This period roughly corresponds to the 2007-09 recession in the United States—the most severe recession since the 1930s—where the share of household food expenditures on FAFH declined for the first time in several decades (chapters 3 and 4).[58] These findings demonstrate that Americans economized by eating less FAFH. The larger decline in consumption at full-service restaurants (on a percentage basis) than at fast-food establishments indicates some economizing within FAFH options, consistent with expenditure patterns discussed in chapter 4. But, by 2011-12, FAFH rose again to 34 percent of calories and fast food grew to 15.8 percent of calories, and this resurgence continued through 2013-14 with total FAFH at 33.7 percent and fast food at 15.9 percent of calories, respectively. This quick rebound suggests that FAFH is now an ingrained preference that Americans quickly return to when economic conditions permit.

[58]The National Bureau of Economic Research's Business Cycle Dating Committee determined that the recession began in December 2007 and ended in June 2009.

Definitions of Food Sources

Across all surveys, food sources are classified into two main categories, defined by where the food was purchased. Food from supermarkets, smaller grocery stores, supercenters, or other retailers is defined as food prepared at home (FAH) although it could include prepared or semi-prepared items such as rotisserie chicken or bagged salad. Food prepared away from home (FAFH) includes foods obtained from full-service restaurants with wait staff, fast-food establishments with no wait staff, food obtained at school or day care, and a catchall "other" subcategory that includes vending machines, common coffee pot/snack tray, Meals on Wheels, from someone else, street vendor, etc.

The food source coding scheme differs between USDA's Nationwide Food Consumption Survey (NFCS), Continuing Survey of Food Intakes by Individuals (CSFII), and What We Eat in America (WWEIA)/National Health and Nutrition Examination Survey, but many sources are common in all surveys, such as grocery store, restaurant with waiter/waitress service, fast food, and school cafeteria. In this report, food sources are aggregated into two broad categories—FAH and FAFH—and FAFH is further disaggregated into restaurant, fast food, school, and other FAFH.

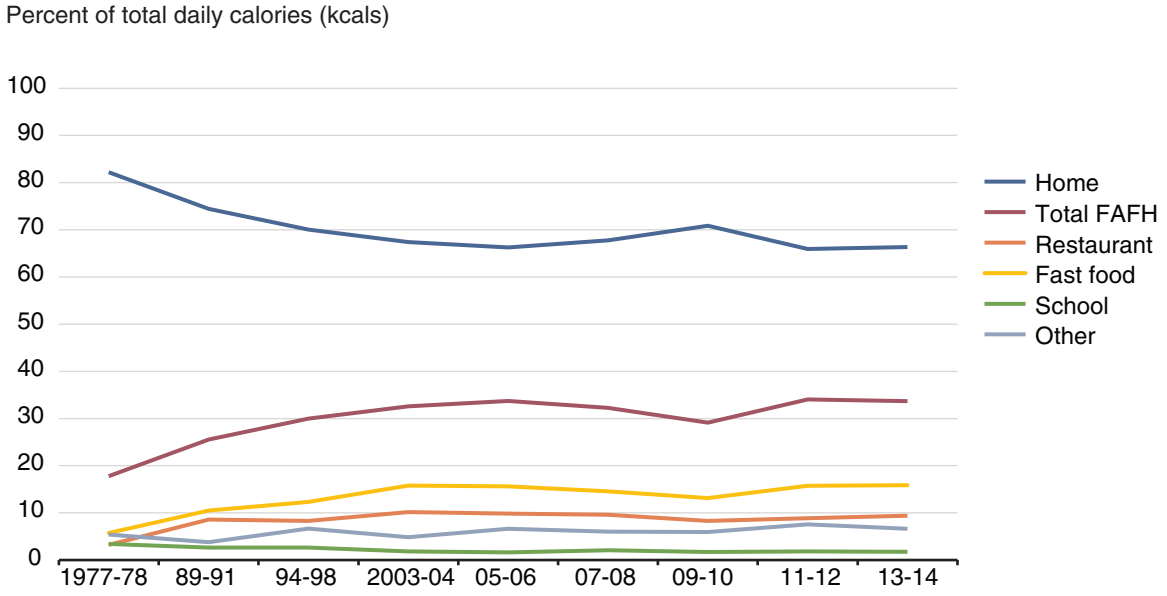
The definitions of FAH and FAFH are anchored on where the food was obtained. FAH food can be eaten away from home and FAFH food can be eaten at home. For example, FAH includes breads and peanut butter purchased at grocery stores and eaten as a peanut butter sandwich at home, school, or work. Meanwhile, home delivery or takeout from a pizza parlor is classified as FAFH even if it is eaten at home.

The restaurant category includes restaurants with waiter service. Fast-food establishments include restaurants without waiter service, fast food, pizza, and cafeterias at work or residential facilities. Several eating places—including bar, tavern, lounge, sport, recreation, and entertainment facilities—are in categories separated from "restaurant with waiter service" in all surveys, but not identified in the 1977-78 NFCS. There is no cut-and-dried rule as to whether they should be included in restaurant or fast food; in this study, these eating places (as well as vending machines) are included in the fast-food category. The school category includes school cafeterias (meals and a la carte), daycare, and summer camp.

The FAH category includes foods purchased from grocery and other stores (e.g., convenience and drug stores), mail order, and foods grown or caught by the respondent or someone else. Foods obtained at a soup kitchen, food pantry, or community feeding program are classified as either FAH (if eaten at home) or other FAFH (if eaten away from home).

Figure 7.1

Share of mean daily energy intake from food prepared at home and away from home, U.S. population age 2 and older



Note: FAFH = food away from home.
Source: USDA, Economic Research Service using data from the USDA Nationwide Food Consumption Survey (NFCS), 1977-78; USDA Continuing Survey of Food Intakes by Individuals (CSFII), 1989-91 and 1994-98; and the National Health and Nutrition Examination Survey (NHANES), 2003-04, 2005-06, 2007-08, 2009-10, 2011-12, 2013-14.

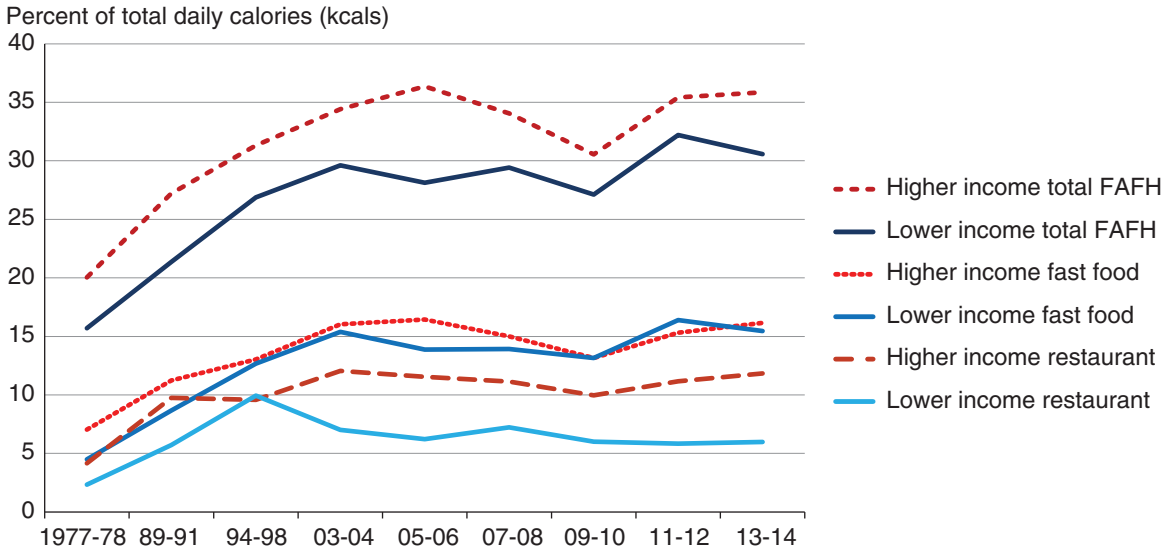
The shift to more FAFH was broad-based, although the extent of change varied across income and age groups, as did the importance of specific FAFH sources (Guthrie et al., 2016). Comparing individuals living in higher income households (above 185 percent of the Federal poverty level[59]) with those in lower income households (at or below 185 percent), lower income individuals participated in the trend toward consuming more FAFH, but to a lesser extent (figure 7.2). Choices within the FAFH sectors also varied: both higher and lower income individuals increased fast-food consumption, but consuming food from restaurants with wait staff was less common for lower income individuals, which is not surprising given its typically higher price.

In 1977-78, FAFH made up 18.8 percent of the diets of children and youth ages 2-19. Over time, their intake of FAFH—particularly from fast food—grew in parallel to that of adults (figure 7.3). In 1977-78, fast food provided less than 4 percent of the mean daily energy intake of children and youth. Their intake of calories from fast food peaked at 16.5 percent of total calories in 2003-04, declined to 12.6 percent in 2009-10, and rose again to 16 percent in 2013-14. At the same time, the importance of school foods diminished. In 1977-78, school foods provided 8.9 percent of total calories, but just 6-7 percent of calories for those age 2-19 since 2003. Lower income children and youth ate more school foods at all time periods, probably because they are eligible for free or reduced-price USDA school meals (figure 7.4). In earlier time periods, lower income children and youth ate less fast food than their higher income counterparts. In 2011-12, their FAFH intakes were very similar—14.2

[59]The 185 percent of poverty threshold is the cutoff for income eligibility to such public food assistance as the Special Supplemental Program for Women, Infants, and Children (WIC) and reduced-price USDA school meals, and is therefore frequently used to group households by income.

Figure 7.2

Share of mean daily energy intake from food away from home sources, by income, U.S. population age 2 and older



Notes: FAFH = food away from home. Restaurant = full-service restaurant (with wait staff). Fast food = restaurant with counter service only. Higher income defined as household income above 185 percent of the Federal poverty level. Lower income defined as household income at or below 185 percent of the Federal poverty level.
Source: USDA, Economic Research Service using data from the USDA Nationwide Food Consumption Survey (NFCS), 1977-78; USDA Continuing Survey of Food Intakes by Individuals (CSFII), 1989-91 and 1994-98; and the National Health and Nutrition Examination Survey (NHANES), 2003-04, 2005-06, 2007-08, 2009-10, 2011-12, 2013-14.

percent of calories for lower income children and youth and 14.4 percent for higher income children and youth. However, in 2013-14, the disparity widened once more, with higher income children consuming 16.8 percent of calories from fast food, compared to lower-income children at 15.2 percent of calories.

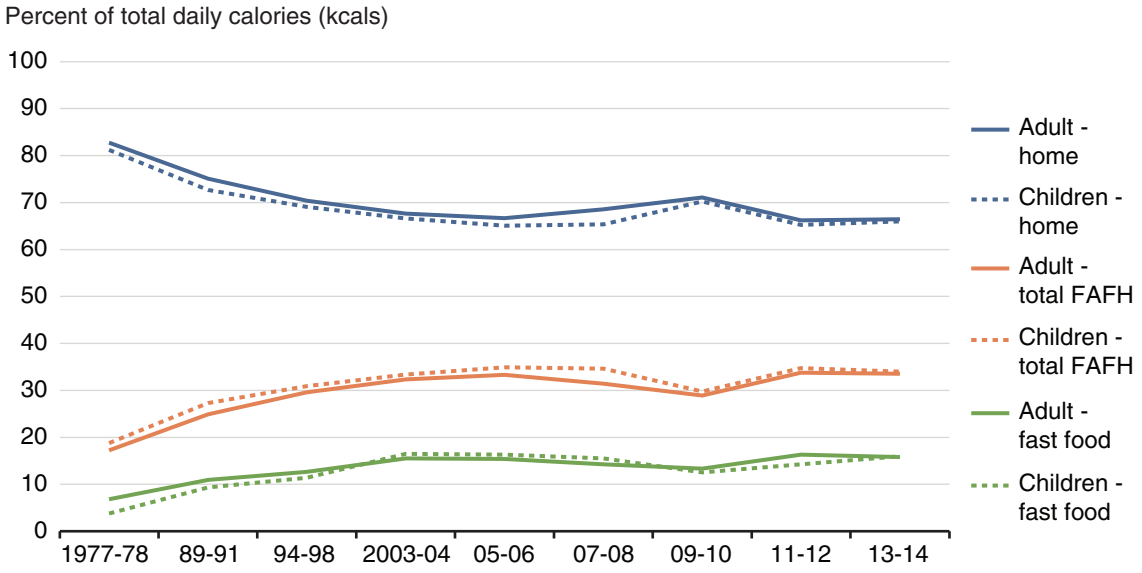
Nutrient Differences Between FAH and FAFH

In the 1990s, the nutritional quality of FAFH was inferior to FAH (Guthrie et al., 2002). In recent years, the nutritional quality of restaurant and fast-food meals has been subject to more scrutiny, with several major chains offering healthier options. At the same time, grocers and supermarkets are offering more prepared options. These changes may have narrowed the differences in caloric intake and nutritional density between FAH and FAFH.

However, changes in nutrient databases make it difficult to assess changes in the nutritional composition of FAH and FAFH over time. For perspective, the focus of this analysis is on changes in the fat composition of FAH and FAFH at two time points: 1977-78 and 2011-14. There are two reasons for focusing on fat. First, unlike some other nutritionally important components, such as saturated fat, dietary fat totals are available at both time points. Second, during the time period in question (1977-2014), reduction in the fat content of diets was a major focus of attention from both nutritionists and the general public. For example, the Nutrition Facts panel on packaged goods, as implemented in 1994, required information on both grams of fat in the product and calories from fat. (The most recent edition of the Federal *Dietary Guidelines for Americans* (USDHHS and USDA, 2015) shifted focus to the type of fat consumed, recommending replacing saturated fats with oils.)

Figure 7.3

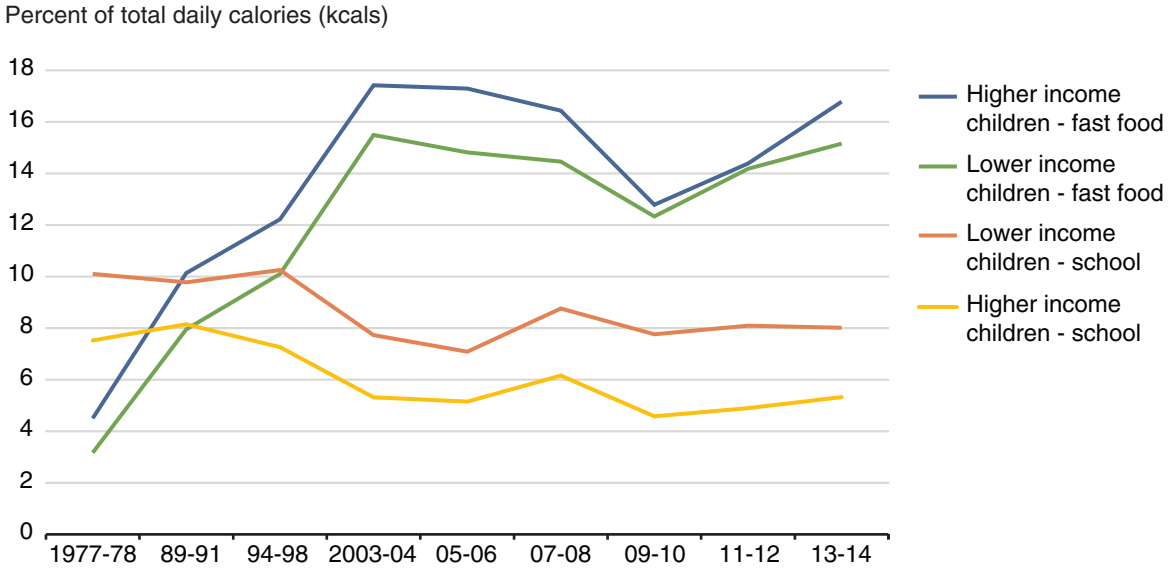
Share of mean daily energy intake from food at home, total food away from home, and FAFH-fast food, children ages 2-19 and adults



Notes: FAFH = food away from home.
Source: USDA, Economic Research Service using data from the USDA Nationwide Food Consumption Survey (NFCS), 1977-78; USDA Continuing Survey of Food Intakes by Individuals (CSFII), 1989-91 and 1994-98; and the National Health and Nutrition Examination Survey (NHANES), 2003-04, 2005-06, 2007-08, 2009-10, 2011-12, 2013-14.

Figure 7.4

Calorie intake by U.S. lower income households with children and youth ages 2-19 from consuming fast food versus school meals



Notes: Higher income defined as household income above 185 percent of the Federal poverty level. Lower income defined as household income at or below 185 percent of the Federal poverty level.
Source: USDA, Economic Research Service using data from the USDA Nationwide Food Consumption Survey (NFCS), 1977-78; USDA Continuing Survey of Food Intakes by Individuals (CSFII), 1989-91 and 1994-98; and the National Health and Nutrition Examination Survey (NHANES), 2003-04, 2005-06, 2007-08, 2009-10, 2011-12, 2013-14.

If FAH and FAFH changed in response to public interest in nutritional quality, change in the fat composition of these sources would be most likely to be apparent. These changes could occur because of different choices being made by consumers (e.g., choosing a lean grilled chicken sandwich instead of fried chicken), changes in product formulation (e.g., food manufacturers developing a lower fat lasagna), or both.

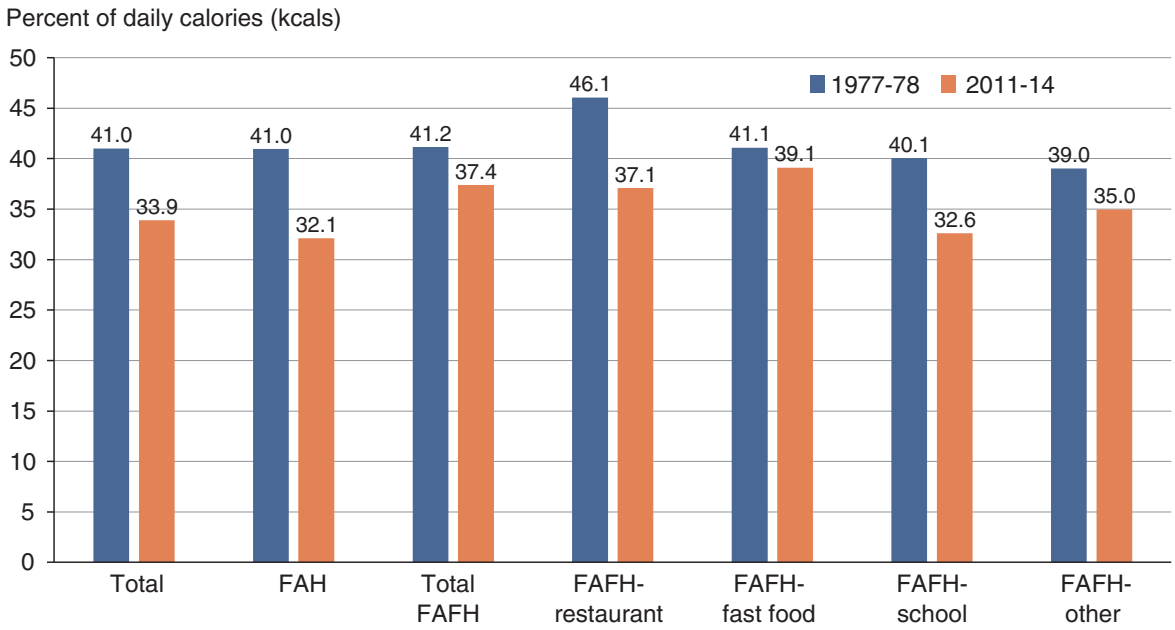
In addition to fat composition, the nutrient density of five additional dietary components is examined—saturated fat, sodium, calcium, iron, and dietary fiber—using 2011-12 data. For all components except dietary fat and saturated fat, density is defined as amount per 1,000 calories; for dietary fat and saturated fat, it is defined as percent of total calories.

Change in Fat Content of FAH and FAFH: 1977-78 and 2009-12

Total fat content of FAH and FAFH as a percent of total calories was essentially identical in 1977-78, at 41 and 41.2 percent of calories, respectively (figure 7.5). By 2011-14, the fat content of FAH was significantly lower than that of FAFH. Fat in FAH had dropped to 32.1 percent of calories, below the upper limit of 35 percent recommended by the Food and Nutrition Board of the National Academies of Sciences (FNB, 2002). For FAFH, the drop was less precipitous, going from 41.2 percent to 37.4 percent. Moreover, that drop masked considerable variation within FAFH categories. The fat content of school meals dropped almost as much as FAH, going from 40.1 percent to 32.6 percent of calories. The fat content of fast food, on the other hand, changed very little, going from 41.1 percent in 1977-78 to 39.1 percent in 2011-14.

Figure 7.5

Fat density of all food sources, food at home and food away from home



Notes: FAH = food at home. FAFH = food away from home.
Source: USDA, Economic Research Service using data from the USDA Nationwide Food Consumption Survey (NFCS), 1977-78 and the National Health and Nutrition Examination Survey (NHANES), 20011-14.

Nutrient Densities of FAH and FAFH and Differences in Contribution to Total Intake

Table 7.1 presents differences in the nutrient density of FAH and FAFH in 2011-14. The selected dietary components can be subdivided into those for which a lower density diet would be optimal—saturated fats and sodium—and those for which a more dense diet would be optimal—calcium, iron, and dietary fiber.

The most recent Federal *Dietary Guidelines for Americans* recommends that Americans consume less than 10 percent of calories per day from saturated fats. Both FAH and FAFH density exceeded that standard in 2011-14, but FAH, at 10.6 percent of calories, is significantly lower than FAFH at 12.2 percent. The saturated fat density of fast food is particularly high at 13 percent of calories (table 7.1).

The Healthy Eating Index-2010—developed by USDA's Center for Nutrition Policy and Promotion in collaboration with the National Cancer Institute (Guenther et al., 2013)—is used to measure how well diet quality conforms to Federal dietary recommendations. Its sodium standard sets the maximum sodium density of the diet at no more than 1,100 milligrams per 1,000 calories (see data box in chapter 8). Both FAFH and FAH exceed that standard, but again FAFH was significantly higher in 2011-14—1,796 mg/1,000 calories versus 1,535 mg/1,000 calories for FAH. Wait-staff restaurant and fast-food sources are both high in sodium density at 1,962 mg and 1,833 mg per 1,000 calories, respectively (table 7.1).

Calcium density is significantly higher for FAH than for FAFH sources, with one notable exception. School food, at 725 mg/1,000 calories, has significantly higher calcium density than any source. Milk is served with USDA-funded school breakfasts and lunches, and cheese is an ingredient in popular school foods such as pizza. Since dairy foods are the largest contributors to calcium intake, school foods are particularly calcium-rich.

Table 7.1
Nutrient density by food source, 2011-14

Nutrient	Food sources						
	Total	FAH	Total FAFH	Full-service restaurant	Fast food	School	Other FAFH
	Percent of calories						
Saturated fats	11.16 (11.05-11.27)	10.63 (10.51-10.76)	12.16 (12.03-12.30)	11.28 (11.01-11.55)	12.98 (12.80-13.16)	11.83 (11.55-12.12)	11.58 (11.26-11.91)
	Per 1,000 calories						
Sodium (mg)	1,625 (1,614-1,635)	1,535 (1,523-1,547)	1,796 (1,777-1,815)	1,962 (1,923-2,001)	1,833 (1,812-1,853)	1,651 (1,608-1,693)	1,532 (1,489-1,575)
Calcium (mg)	466 (460-471)	503 (496-511)	394 (387-400)	336 (325-346)	419 (409-429)	725 (704-746)	342 (329-354)
Iron (mg)	7.03 (6.97-7.09)	7.53 (7.45-7.61)	6.07 (6.01-6.13)	5.97 (5.86-6.07)	6.07 (5.99-6.15)	6.99 (6.81-7.17)	6.02 (5.88-6.15)
Fiber (g)	7.77 (7.65-7.89)	8.38 (8.21-8.55)	6.60 (6.50-6.69)	6.81 (6.56-7.06)	6.31 (6.19-6.43)	8.13 (7.89-8.37)	6.62 (6.40-6.85)

Note: FAH = food at home. FAFH = food away from home. Numbers in parentheses indicate the 95% confidence interval.

Source: USDA, Economic Research Service using data from the National Health and Nutrition Examination Survey (NHANES) 2011-14.

Iron and dietary fiber density of FAH are both significantly higher than for total FAFH. However, iron density of school foods is significantly higher than for other FAFH sources, while dietary fiber densities of FAH and school foods are not significantly different (table 7.1). School breakfasts and lunches provided through USDA-funded meal programs are expected to meet nutrition standards established by USDA, resulting in those meals having a different nutrient profile than other FAFH sources.

Conclusion and Discussion

This chapter presents data from large, nationally representative food consumption surveys that provide insights into how the shift from FAH to FAFH may have affected the nutritional quality of diets. The analysis is not without weaknesses. Changes in survey methodology, especially methods of collecting food intake data, may affect the comparability of data collected by the individual surveys, as may the problems of underreporting and self-selection that plague surveys of dietary intake. In addition, descriptive studies cannot draw causal interpretations. More sophisticated multivariate analysis is needed to fully assess the determinants of this trend. Nevertheless, these descriptive findings provide information that can guide discussion and inform future analyses.

Over the past four decades, food prepared away from home has almost doubled as a share of the average caloric intake of Americans. The strongest economic downturn since the 1930s resulted in a decline in FAFH in 2007-10, but by 2011-12, consumption of FAFH had rebounded (consistent with expenditure patterns discussed in chapters 3 and 5). This indicates the strength of consumers' desire to include FAFH in their diets.

Lower income Americans participated in the shift to more FAFH, though to a lesser extent than higher income consumers, and chose proportionately more of the lower cost, fast-food option. Compared to their higher income peers, lower income children also obtained a larger share of daily calorie intake from school, where they are income-eligible for free or reduced-price meals through USDA's National School Lunch Program.

Of particular interest is FAFH consumption by children. School foods in this analysis include both foods provided as part of USDA-funded school meals (breakfast and lunch) and other foods obtained at school. Non-USDA school foods are sometimes termed "competitive foods" because their sale can be seen as competition with USDA school meals (Guthrie et al., 2013). Although FAFH as a whole is less nutritious than FAH, school foods are more calcium-dense than home foods, similar to home foods in dietary fiber content, and more iron-dense than other FAFH.

In 2011-12, USDA-sponsored school meals had nutrition standards specifying that the meals would contain minimum amounts of calcium, iron, and other dietary essentials, and limiting fat and saturated fat levels. In the school year of 2012-13, USDA required schools participating in its National School Lunch Program (NSLP) to begin serving lunches that met updated nutrition standards, requiring lowfat milk, fruits, a healthier mix of vegetables, and more whole grains (Guthrie and Newman, 2013). In 2013-14, new standards for school breakfasts were implemented requiring lowfat milk, more whole fruit, and whole grains. These updated standards could be expected to impact school foods consumed by children in 2012-14. However, either in anticipation of new standards or because of their own desire to offer the most nutritious meals possible, some school foodservices began offering healthier meals even before the required dates of implementation. In addition, some vendors serving the school foodservice market had begun offering healthier products, such as pizzas with whole grain-rich crusts. These changes had already led to some improvement in the nutritional quality of foods consumed (Newman, 2013; Fox et al., 2010).

During the data collection time period, few limits were placed on competitive foods, and the most commonly purchased items were desserts, sweetened beverages, and salty snacks (Guthrie et al., 2013). In 2014-15, new standards for competitive foods were implemented, requiring limits on sodium, fat, and sugars (Guthrie and Newman, 2013). These changes would be expected to further improve the nutritional profile of school foods. A number of small studies suggest that at least in some schools, students are reacting positively to the changes and eating the healthy foods offered to them (Ralston and Newman, 2015; Johnson et al., 2016).

There are some encouraging signs of change in nonschool FAFH, particularly related to children's options. With growing social awareness of the problem of childhood obesity, more parents have become concerned about the FAFH choices offered to children. Recent years have seen an increase in healthier options as part of children's meals served at restaurants and fast-food establishments (CBS News, 2011). Some establishments have even begun offering them as the default—that is, the standard children's meal comes with a healthier beverage or side item, such as fruit, possibly with other options, such as fried potatoes, available upon request (Wootan, 2012). Some fast-food companies have agreed to voluntary standards limiting advertising of less nutritious foods to children (Kolish et al., 2015). Some studies have reported positive changes in the nutritional content of children's meal orders, indicating these efforts may be paying off (Wansink and Hanks, 2014; Peters et al., 2016). Some restaurants may brand themselves as promoting healthful options for children and families, further shifting norms (Peters et al., 2016).

Looking forward, the visibility and ubiquity of healthful FAFH options may make healthful choices more normative. Ideally, this could create a virtuous circle in which changes in social attitudes lead to increased demand for healthier options, generating a supply-side response that makes it ever easier to prioritize health. Such changes are unlikely overnight and may be more pronounced in certain segments of the population. Parents may be quicker to make changes for their children. Among adults, menu labeling likely will appeal disproportionately to health-conscious consumers (see chapter 10). Less health-conscious consumers might experience the spillover benefit of availability of healthier versions of popular items. Or, given a dynamic marketplace, some FAFH establishments might specialize in more indulgent items, appeasing less health-conscious consumers.

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

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

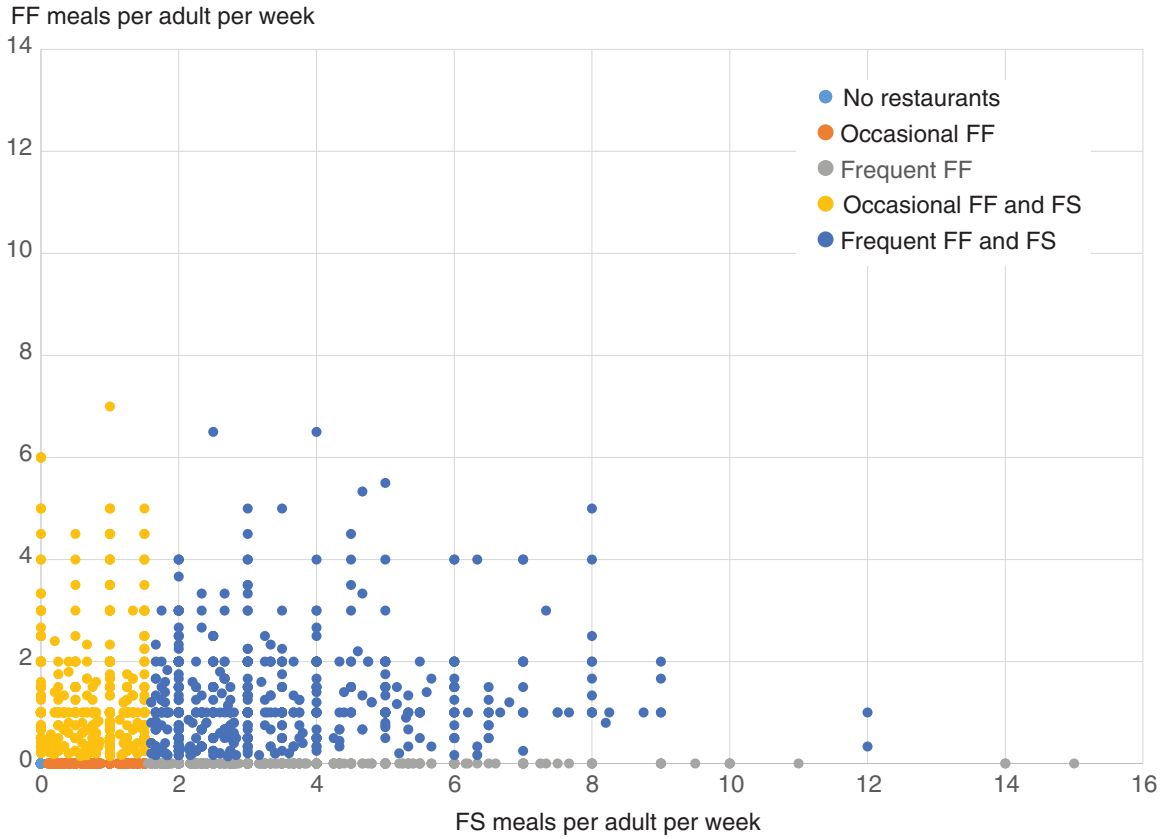
	Maximum score	Standard for maximum score[1]	Standard for minimum score of zero
Adequacy :			
Total fruits	5	≥0.8 cup	No fruits
Whole fruits	5	≥0.4 cup	No whole fruits
Total vegetables	5	≥1.1 cup	No vegetables
Greens and beans	5	≥0.2 cup	No dark green vegetables or legumes
Whole grains	10	≥1.5 oz	No whole 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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Chapter 9: What Role Does Food Away From Home Play in the Diets of Food Assistance Recipients?

Using data from the National Household Food Acquisition and Purchase Survey (FoodAPS), this chapter examines the diet quality of food away from home (FAFH) consumed by food assistance recipients. The average 2010 Healthy Eating Index (HEI-2010) score for FAFH was lower than for food at home (FAH) for all households by income and participation in the Supplemental Nutrition Assistance Program (SNAP).

Several policies have been proposed to help consumers opt for healthier food choices. Food assistance is intended to increase food security and support healthy diet quality for the low-income elderly, individuals with disabilities, and children. USDA's Supplemental Nutrition Assistance Program (SNAP) is a Federal program designed to increase the food purchasing power of low-income participants. Households qualify for the program if their income is below 130 percent of the Federal poverty threshold;[69] households are also able to categorically qualify for the program if they participate in other Federal assistance programs. As of June 2017, 41 million individuals participated in SNAP, which is a decrease from a high of 47 million in the aftermath of the Great Recession.

The role of food away from home (FAFH) in the diets of SNAP recipient households is of concern, as previous studies have found that FAFH reduces diet quality[70] (Todd et al., 2010), and overall diet quality is lower for SNAP recipient households than for nonrecipients (Condon et al., 2015). While SNAP benefits cannot be used directly to purchase FAFH in most circumstances, SNAP recipient households do purchase FAFH with other resources. Yet little is known about the relationship between FAFH, dietary quality, and SNAP participation.

Chapter 8 discusses the associations between purchase frequency of FAFH and diet quality. This chapter focuses on the importance of FAFH in the diets of a subset of individuals who participate in food assistance programs, using the Healthy Eating Index -2010 (HEI-2010). The HEI-2010 was developed to measure how well individuals meet the *2010 Dietary Guidelines for Americans*; it can also be used to measure the nutritional quality of the food supply, foods available in a grocery store, or two different market baskets (Strasser et al., 2015). The National Household Food Acquisition and Purchase Survey (FoodAPS) collects data on all foods purchased or otherwise acquired for all household members, so the HEI can be used to measure how closely the reported household-level acquisitions over a week match dietary recommendations.

FoodAPS is used to calculate Healthy Eating Index (HEI-2010) scores for SNAP recipient households, as well as for low-income and higher income nonparticipants (see data box in chapter 5

[69]The U.S. Census Bureau calculates the poverty threshold annually based on a minimum income level for a given number of household members in order to provide an income measure of poverty for the current year. Household income can then be reported relative to the threshold, i.e., 130 percent of the threshold, 180 percent of the threshold, etc. The poverty threshold for a family of 4 in 2016 was $24,300.

[70]The literature on food away from home varies somewhat in what is included. Todd's study of adults counted a meal as FAFH if the majority of calories were obtained from fast food, table-service restaurants, cafeterias, or taverns. This study includes the following categories in FAFH: eating places (restaurants, fast-food outlet, carry out, coffee shop, vending machine, etc.); schools; noncommercial places (family, friends, parties, and places of worship); work (any event reported at work); and food banks and Meals on Wheels. The nutritional quality of these sources would be expected to differ, but in the FoodAPS survey all FAFH sources have lower HEI-2010 scores than FAH, and diet quality for food from family, friends, parties and places of worship was similar to that of food from restaurants and other eating places (Mancino et al., 2018a).

for details on FoodAPS). Diet quality of FAFH for SNAP recipient households is compared to nonparticipants at different income levels, as well as potential factors that could affect this outcome. Because diet quality of children is a concern and because households with children may receive food assistance through school meals, adult-only households are analyzed separately from those with children. This chapter addresses the following questions:

1. How does diet quality for FAFH compare to diet quality for FAH among SNAP recipient households and nonparticipant households at different income levels?
2. How does diet quality for FAFH among SNAP recipient households with adults only compare to other segments of the population?
3. How does diet quality for FAFH among SNAP recipient households with children compare to other segments of the population?
4. Do SNAP recipient households with working members obtain higher diet quality from FAFH?
5. Do SNAP recipient households with a higher level of nutrition knowledge acquire FAFH with higher diet quality?
6. How does the diet quality of school meals compare to other FAFH acquired by households with children?

Previous Related Research

Per capita FAFH expenditures are significantly less for SNAP recipient households than for eligible nonparticipant households and considerably less than for households above 185 percent of the Federal poverty threshold. Tiehen and colleagues (2017) found that weekly expenditures on restaurants and other eating places for SNAP recipient households were about $11 per adult-male equivalent[71] (AME) compared to $21 per AME for eligible nonparticipant households and $30 per AME for households above 185 percent of the Federal poverty threshold.

On a nutrient basis, however, the differences are much narrower and reveal the importance of FAFH in the diets of individuals across the income spectrum. Other studies using FoodAPS found that FAFH accounted for 31 percent of calories in SNAP recipient households' acquisitions, only slightly less than the 34-percent share for households above 185 percent of the poverty threshold (Mancino et al., 2018).[72] The greater similarity in share of calories than in total expenditures suggests that SNAP households likely choose lower cost FAFH options. Average daily calories per person in SNAP households (in FoodAPS) totaled 3,055 kcal per AME, almost as many as for households above

[71]An AME is a normalized consumption unit requiring 2,200 calories per day, similar to the standard adult equivalent requiring 2,000 calories per day, discussed in Chapter 8. To compare households of different sizes and age compositions, the number of normalized units is calculated by weighting household members by their daily calorie requirements as a fraction of the standard.

[72]These calorie shares are lower than overall share of calories from FAFH reported by Lin and Guthrie (2012) based on the 2005-08 National Health and Nutrition Examination Survey (NHANES) (32 percent), and calorie totals are higher than the average daily per capita calorie intake from NHANES (2,002). The difference in results may reflect the fact that NHANES measures food consumption using two nonconsecutive 24-hour dietary recalls, while FoodAPS measures food acquisition rather than consumption. If the gap between acquisition and consumption is smaller for FAFH than for FAH, that could partially account for the higher share of calories from FAFH estimated from NHANES. Note also that the calories from FAH are based on food acquired that may not be consumed in the same week, while calories from FAFH are based on food purchases that are likely consumed immediately.

185 percent of poverty (3,209), and more than for nonparticipant households at 100-185 percent of poverty (2,800).[73]

Davis (2014) examined why FAFH accounts for a substantial portion of food intake by SNAP recipient households even though their incomes are low and benefits cannot be used for FAFH directly. Using a theoretical model of household decisions, Davis explained that households' decisions about how much FAH and FAFH used in meeting food needs are influenced by the opportunity cost of time, the share of time cost in the total cost of meeting household food needs, and the elasticity of substitution between time and goods in meeting household food needs. Davis reviewed the available literature on these factors to show that the cost of time in food acquisition and preparation is high and that the elasticity of substitution between time and goods in meeting household food needs is low. These conditions, Davis argued, help explain the use of FAFH for a substantial portion of food needs on a calorie basis in households facing time pressure, with SNAP benefits freeing up resources for use in purchasing FAFH, even when the benefits cannot be used directly.

You and colleagues (2009) showed that including moderate FAFH spending in the Thrifty Food Plan (TFP) calculation can result in nutrient consumption similar to the original TFP, while allowing for convenience and practicality in feeding a family. Still, FAFH has been found to degrade diet quality, on average. Todd and colleagues (2010) found that every meal eaten away from home in 2003-04 lowered intake of fruit, dark green/orange vegetables, and whole grains, while increasing consumption of saturated fat. Lin and Guthrie (2012) examined data from 2005 to 2008 and found that FAFH was higher in sodium and lower in fiber than food prepared at home. Guthrie, Lin, and Smith (Chapter 7) similarly found FAH is typically nutritionally superior to FAFH—richer in underconsumed nutrients and less dense in overconsumed nutrients. Foods obtained at school, however, were found to be more calcium-rich than FAH and more nutritionally similar to FAH. Mancino and colleagues (2010) also found FAFH to degrade children's diets.

Todd (2014) recently found the nutritional profile of FAFH chosen by consumers has improved, with lower levels of cholesterol and sodium per 1,000 calories, and higher levels of fiber in 2009-10 compared to 2005-06. Todd also found that FAFH consumption declined over 2005-10 due to the 2007-09 Great Recession, but concluded that the recession itself did not cause a change in the nutrients consumed. Todd documented improvements in nutrition awareness over the same period, and cited these improvements as a likely explanation for the change in foods chosen. Increasing nutrition awareness may also prompt vendors to offer more healthy alternatives.

Improvements in diet quality for FAFH would benefit all consumers, but especially SNAP recipient households whose diet quality is inferior to SNAP nonparticipants. Using data from the National Health and Nutrition Examination Survey (NHANES) 2007-10, Condon and colleagues (2015) found that—compared to both income-eligible nonparticipants and higher income nonparticipants—adult SNAP participants consumed less whole fruit, total vegetables, dark green vegetables, orange vegetables, and legumes; and more empty calories (solid fats added sugars, and alcohol).[74] Similarly, consumption of dark green/orange vegetables and legumes was lower for children in SNAP households than for income-eligible and higher income nonparticipants.

[73]Calorie intake at different income levels may also reflect differences in job-related energy expenditures for workers involved in heavy manual labor.

[74]Condon's analysis was based on the 2005 Healthy Eating Index, an earlier version of the measure used in this report.

Data and Methodology

Data from FoodAPS collected in 2012 and 2013 (see data box in chapter 5 for more details on FoodAPS) are used in this analysis. FoodAPS oversampled SNAP recipient households and other low-income households, providing improved information on food acquisitions for this group. FoodAPS is the first survey to provide detailed information on food obtained from all sources for all members of the household, providing a clearer picture of diet quality at the household level for SNAP recipient households. Further, because SNAP reporting status in FoodAPS was confirmed through matching with program administrative data in 22 out of the 27 States covered in the survey, FoodAPS allows for greater accuracy in comparing diet quality of SNAP recipient households and nonrecipient households, as other surveys that include dietary intake are thought to underreport SNAP participation (Kreider et al., 2012).

FoodAPS converts all foods acquired to equivalent amounts of food groups targeted by the *2010 Dietary Guidelines for Americans*, making it possible to assess the diet quality of FAFH using the 2010 Healthy Eating Index (HEI-2010), a scoring system that indicates relative adherence to the Guidelines. The total HEI-2010 score is calculated as the sum of subscores based on adherence to nine targets for foods encouraged by the Guidelines (total vegetables, green vegetables and legumes, total fruit, whole fruit, dairy, whole grains, total protein, seafood and plant protein, and fatty acids as a share of calories) and three targets for moderation (empty calories, or calories from solid fats, added sugars and alcohol; refined grains; and sodium). (See box in chapter 8 for more information about HEI.)

There remain some limitations in using the HEI-2010, versus food intake data, to measure diet quality from food acquisition data. First, the HEI-2010 calculated here is based on food acquisitions over a week but does not take into account food stored by a household before the observation week or foods acquired and reported during the data collection week that may be stored for later use. While this could introduce some variance into a measure of diet quality for an individual, this variance may be diminished for an HEI-2010 score averaged over a population group. Second, the HEI-2010 measure from FoodAPS counts food acquired even if it is not consumed. This is a more serious limitation, since food waste is not evenly distributed across the diet, but rather is higher for fruits and vegetables that are underconsumed. Overall, however, Mancino and colleagues (2018b) found that the HEI-2010 scores and component densities from FoodAPS were similar to HEI-2010 scores based on dietary recall data from the NHANES for 2011-12.

FoodAPS uses detailed data collected on income together with household size to construct an estimate of the household's income as a percent of the Federal poverty line. FoodAPS also collected responses on nutrition knowledge and attitudes from a primary respondent in each sampled household. This analysis investigates the healthfulness of FAFH purchases by SNAP and non-SNAP households by income group (less than 130 percent of the poverty threshold, which is the cutoff for SNAP eligibility; 130-185 percent of the poverty threshold, since 185 percent confers income eligibility in other food assistance programs; and above 185 percent of the poverty threshold); by household type (with and without children); and by employment status. Differences in HEI-2010 for FAFH between households with higher levels of nutrition awareness and those with less awareness are also explored. To adjust for the stratified sample design of FoodAPS, jackknife weights were used (USDA/ERS, 2016) to calculate average estimates and variance; estimates that are statistically significant at 1, 5, or 10 percent are discussed.

2010 Healthy Eating Index Scores for Food Away From Home Versus Food at Home

Looking at HEI-2010 scores for all households, the average HEI-2010 score for FAFH is significantly lower than for FAH in all non-SNAP income categories, but not for SNAP recipient households (fig. 9.1). The difference between scores for FAFH and FAH increased with income, as the spread across income and SNAP participation groups was smaller for FAFH than for FAH. While HEI-2010 scores for FAH ranged from 46 to 54 across income and SNAP participation groups, scores for FAFH ranged from 42 to 45. Only households above 185 percent of the poverty level had significantly higher HEI scores than SNAP recipient households for FAFH, while all income groups had significantly higher FAH scores than SNAP households. The results suggest that food choices away from home are more similar across the income spectrum than food choices at home, which could reflect consumer preferences as well as the offerings made available by vendors in response to those preferences. `

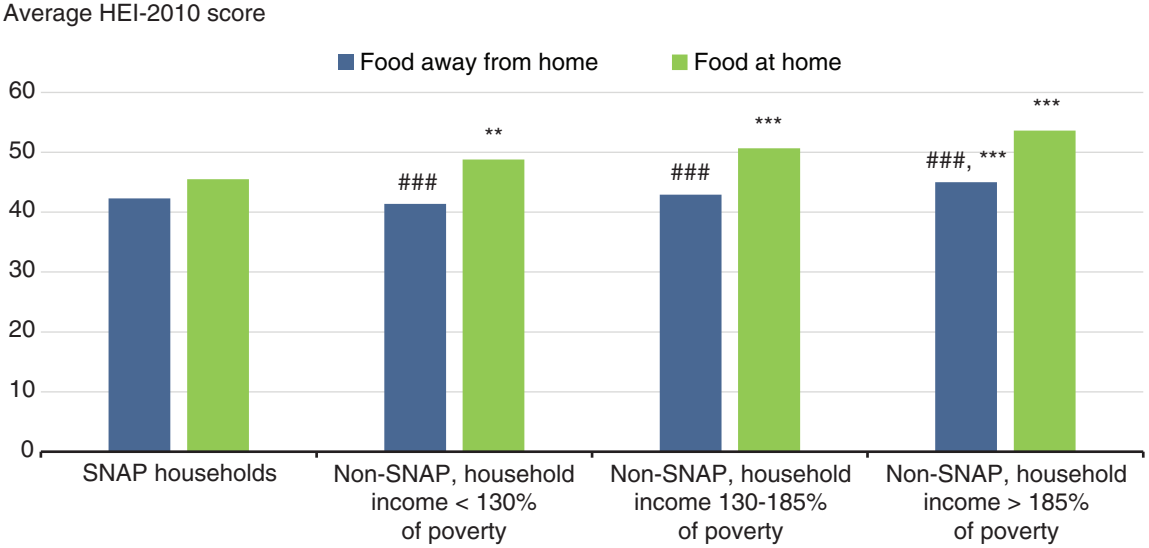
The FoodAPS data do not allow for attribution of food acquisition events to either adults or children, but they do allow for examination of the HEI-2010 score for FAFH acquired by households with only adults and for those with children. The results, then, are indicative of the nutritional quality of foods in households with different age ranges rather than a comparison of nutritional quality between adults and children.

Households Without Children

For households with adults only, average HEI-2010 scores for FAFH (HEI-FAFH) are also narrowly distributed across income and SNAP participation groups, ranging from 40 to 45 (fig. 9.2), suggesting low levels of adherence to the *2010 Dietary Guidelines* across the income distribution, similar to the results for all households. Differences in total HEI-FAFH scores compared to SNAP recipient households were statistically significant at the 10-percent level for households at 130-185 percent of the poverty line and statistically significant at the 1-percent level for households above 185 percent of the poverty level. The HEI-FAFH score for nonrecipient households below 130 percent of the poverty level was not statistically different from SNAP recipient households.

Figure 9.1

HEI-2010 scores for food at home and food away from home, by income and participation in USDA's Supplemental Nutrition Assistance Program (SNAP)

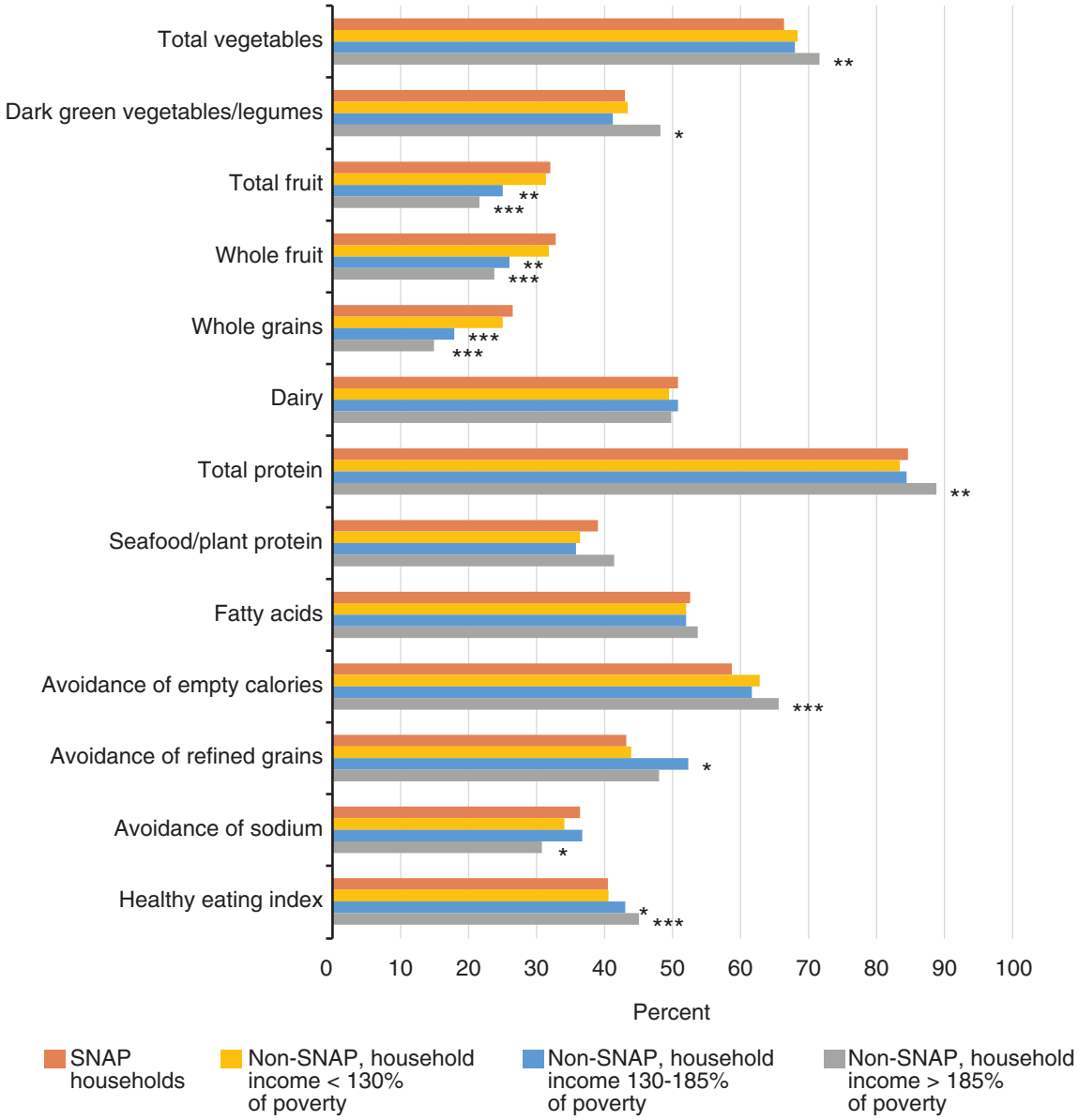


= Significantly different from food at home at the 1-percent level. ** = Significantly different from SNAP households at the 5-percent level, *** = Significantly different from SNAP households at the 1-percent level.
Note: 2010 Healthy Eating Index (HEI-2010) scores presented here provide a profile of foods, as purchased or acquired, relative to the 2010 Dietary Guidelines for Americans, without adjustment for what portion of foods acquired during the observation week were consumed during the week.
Source: USDA, Economic Research Service estimates using National Household Food Acquisition and Purchase Survey, collected 2012 and 2013.

HEI-FAFH subscores for each component, expressed as a percent of the maximum score for the component, were also not significantly different (from SNAP recipient households) in any category for nonrecipient adult households below 130 percent of the poverty level. The scores for total protein, as a percent of the target, were significantly higher for adult households above 185 percent of the poverty level than for adult SNAP recipient households, perhaps reflecting higher meat content in FAFH for higher income households. Scores for total vegetables and dark green vegetables/legumes were also significantly higher for households above 185 percent of the poverty level than for SNAP recipients. However, HEI-FAFH subcomponent scores for total fruit, whole fruit, and whole grains for adult SNAP recipient households were significantly higher than for adult households above 185 percent and 130-185 percent of the poverty level.

Figure 9.2

Food away from home: HEI-2010 score and subcomponents, as a percent of maximum, for households with adults only, by income and participation in USDA's Supplemental Nutrition Assistance Program (SNAP)



* = Significantly different from SNAP recipients at the 10-percent level. ** = Significantly different from SNAP recipients at the 5-percent level.*** = Significantly different from SNAP recipients at the 1-percent level.
Note: 2010 Healthy Eating Index (HEI-2010) scores presented here provide a profile of foods, as purchased or acquired, relative to the *2010 Dietary Guidelines for Americans*, without adjustment for what portion of foods acquired during the observation week were consumed during the week.
Source: USDA, Economic Research Service estimates using National Household Food Acquisition and Purchase Survey, collected in 2012 and 2013.

HEI-2010 for FAFH in Households With Children

Total HEI-FAFH scores in households with children are even more narrowly distributed, with values ranging from 43 to 45 (fig. 9.3) across income groups; total HEI-FAFH was not significantly different for any group. Compared to households above 185 percent of the poverty level, SNAP households have significantly higher HEI-FAFH subscores for whole fruit, but lower subscores for dark green vegetables/legumes and total vegetables.[75] Households at 130-185 percent of poverty have significantly lower scores for whole grains and (avoidance of) empty calories than SNAP households. Non-SNAP households below 130 percent of poverty have significantly lower scores for (avoidance of) refined grains but significantly higher scores for fatty acids and total vegetables.

Among SNAP recipient households, HEI-FAFH is significantly higher for households with children (44) than for adult households (41), but this is not the case for any other income or SNAP participation group.[76] The higher scores for households with children among lower income groups may reflect participation in school meals.

SNAP Households With Working Members

SNAP households with working members may be more reliant on FAFH to meet food needs under more binding time constraints, even though SNAP benefits cannot be used for FAFH. In FY 2012, when FoodAPS was conducted, this group accounted for 31 percent of SNAP households and 51 percent of SNAP households with children (Gray and Eslami, 2014), similar to the latest available figures for FY 2016—32 percent and 55 percent, respectively (Lauffer, 2018). Tiehen and colleagues (2017) found that SNAP recipient households with employed members spent significantly more on FAFH ($14 a week per adult male equivalent, or AME) than those with no employed members ($10 per AME).

The total HEI-FAFH score for SNAP recipient households with working members (43) is higher than for SNAP recipient households with no workers (42), though the difference is not statistically significant (fig. 9.4). The dairy subscore is significantly higher for working SNAP households than for nonworking SNAP households, but seafood, whole grain, whole fruit, dark green vegetable/legume, and total vegetable subscores were significantly lower for working SNAP households. Since SNAP households with working members may have other characteristics that differ from nonworking SNAP households, further research is needed to explore what factors explain observed differences in FAFH choices for these households under time pressure.

The Relationship Between Nutrition Awareness and Attitudes and HEI

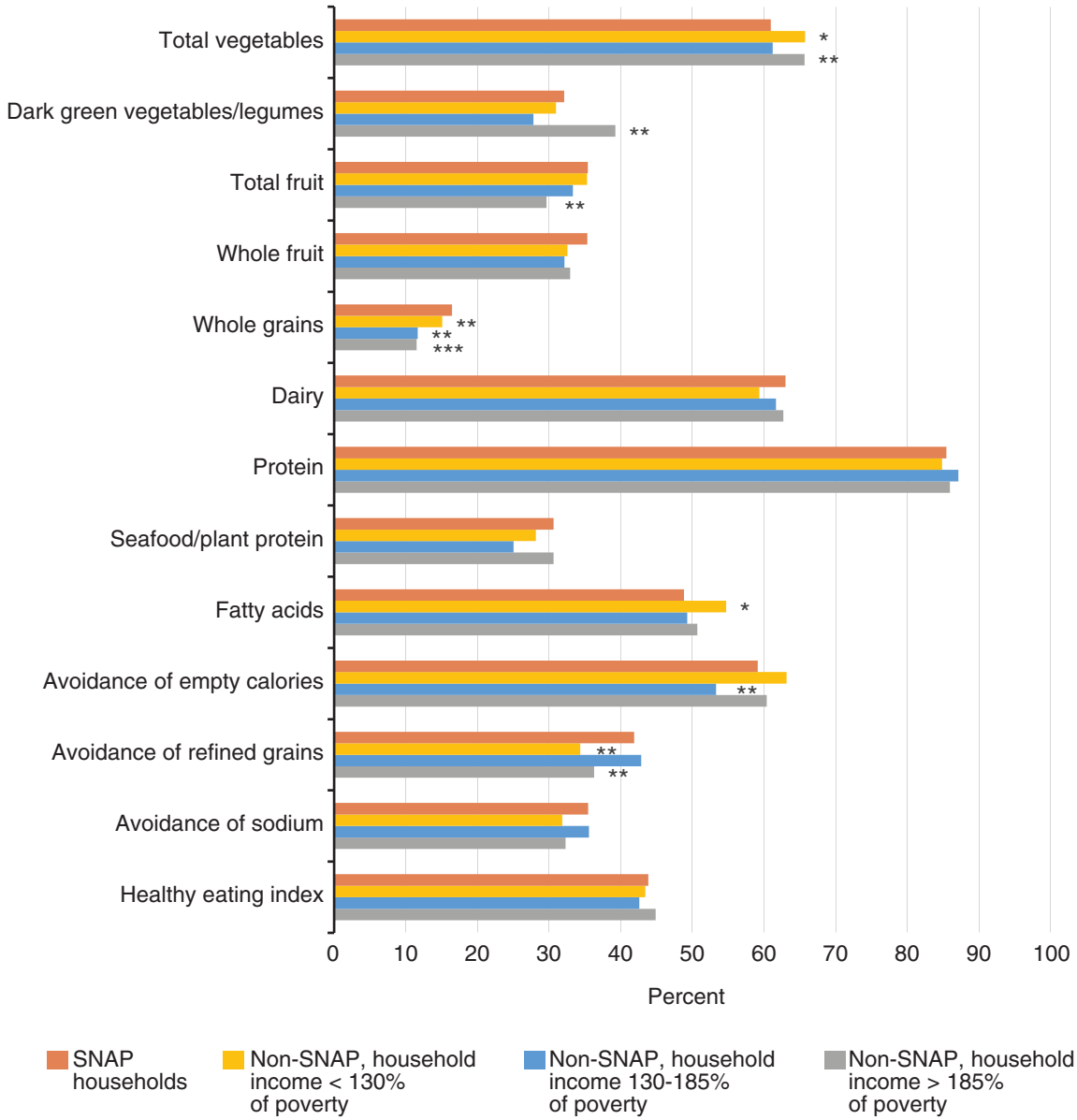
Mancino and Kinsey (2004) examined the relationship between nutrition knowledge and HEI total scores and found that respondents who indicated greater nutrition knowledge had higher HEI scores. This pattern does not appear to hold for FAFH among SNAP recipient households (based on the FoodAPS data), though it does hold for other groups.

[75]Changes in USDA school meal standards implemented in school year 2012-13 required more fruits and vegetables and more whole grains. FoodAPS was collected in the first year that changes in meal requirements were implemented.

[76]Significance test results were not shown in figure 3 for the comparison between HEI-FAFH for households with children and households without children. T-statistics were 0.61 for SNAP households, 1.15 for non-SNAP households below 130 percent of poverty, 1.03 for households at 131-185 percent of poverty, and 0.62 for households above 185 percent of poverty.

Figure 9.3

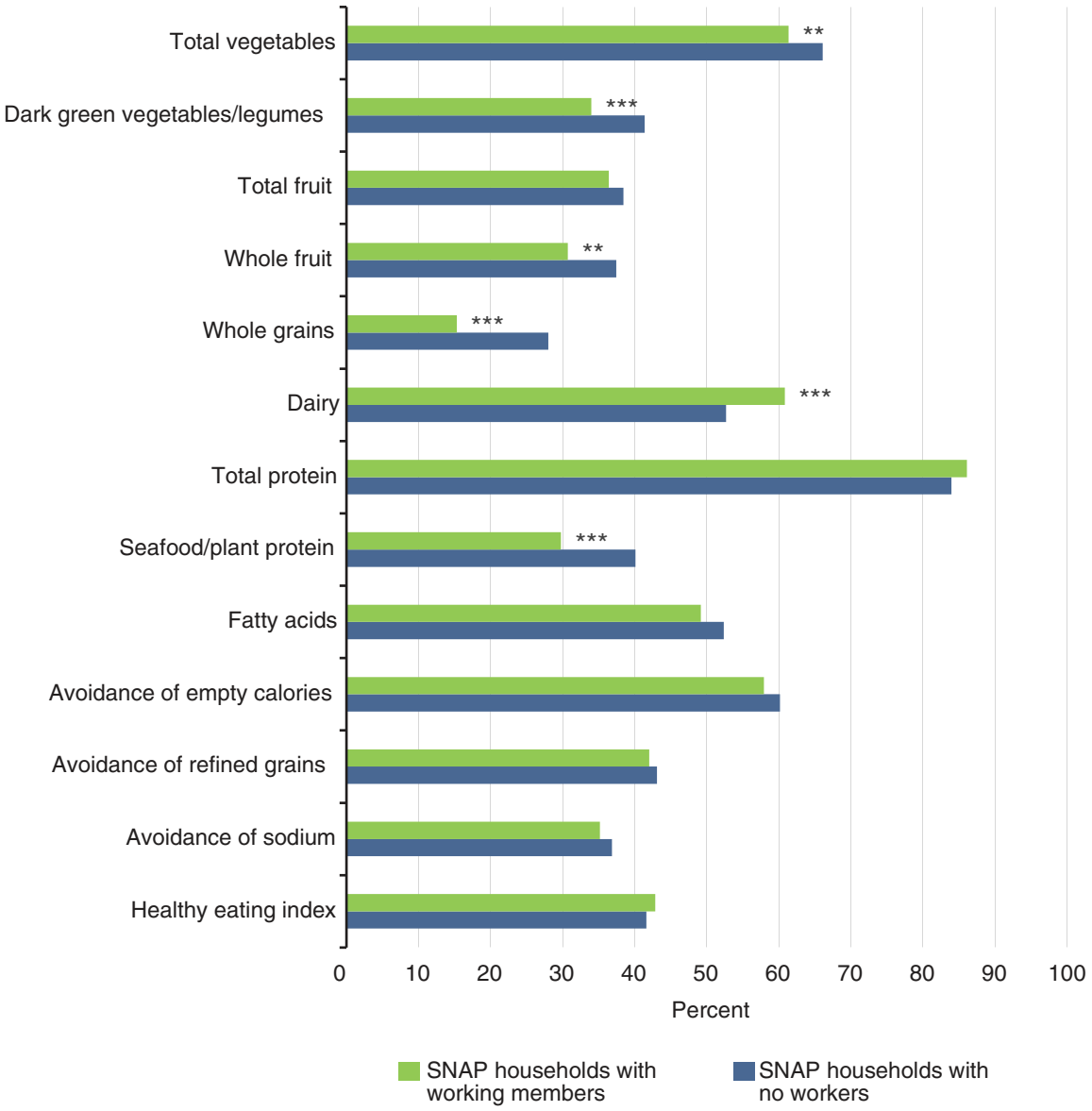
Food away from home: the HEI-2010 score and subcomponents, as a percent of maximum, for households with children by income and participation in USDA's Supplemental Nutrition Assistance Program (SNAP)



* = Significantly different from SNAP recipients at the 10-percent level. ** = Significantly different from SNAP recipients at the 5-percent level. *** = Significantly different from SNAP recipients at the 1-percent level.
Note: 2010 Healthy Eating Index (HEI-2010) scores presented here provide a profile of foods, as purchased or acquired, relative to the *2010 Dietary Guidelines for Americans*, without adjustment for what portion of foods acquired during the observation week were consumed during the week.
Source: USDA, Economic Research Service estimates using National Household Food Acquisition and Purchase Survey, collected 2012 and 2013.

Figure 9.4

Food away from home: HEI-2010 score and subcomponents, as a percent of maximum, by work status of households participating in USDA's Supplemental Nutrition Assistance Program (SNAP)



* = Significantly different from SNAP recipients at the 10-percent level. ** = Significantly different from SNAP recipients at the 5-percent level. *** = Significantly different from SNAP recipients at the 1-percent level.
Note: 2010 Healthy Eating Index (HEI-2010) scores presented here provide a profile of foods, as purchased or acquired, relative to the *2010 Dietary Guidelines for Americans*, without adjustment for what portion of foods acquired during the observation week were consumed during the week.
Source: USDA, Economic Research Service estimates using National Household Food Acquisition and Purchase Survey, collected 2012 and 2013.

To examine the role of nutrition awareness and attitudes in FAFH diet quality, HEI-FAFH scores are compared between respondents who indicated a higher priority placed on nutrition and those who indicated a lower priority, based on responses to questions about nutrition awareness (see box, "Measuring Nutrition Awareness and Attitudes in FoodAPS").

For each statement or question, the difference in average HEI-FAFH score is calculated between respondents whose answers indicated a higher priority placed on nutrition and those whose answers indicated a lower priority. A positive difference indicates that the average HEI-FAFH was higher for "higher nutrition priority" respondents compared to "lower nutrition priority" respondents. Differences are calculated for SNAP households and each nonrecipient cohort.[77]

Among SNAP recipient households, the difference in HEI-FAFH scores is significantly different from zero for only two statements dealing with MyPlate (fig. 9.5). SNAP recipient respondents who reported they had heard of MyPlate have higher HEI-FAFH scores (a difference of 2.3). However, SNAP recipient respondents who reported that they had tried to follow the MyPlate guidelines have significantly lower HEI-FAFH scores (a difference of -5.7). Further research is needed to interpret these findings.

Among non-SNAP households, higher HEI-FAFH scores are observed for a number of statements, especially for respondents with incomes above 185 percent of the poverty line. In that group, those who reported they had heard of MyPlate have HEI-FAFH scores 2 points higher than those in the same income group who had not heard of MyPlate, a statistically significant difference at the 5-percent level. Similar differences are observed for that income group who reported they use Nutrition Facts panels and those who think they should eat more fruits and vegetables. Those who disagreed that it costs too much to eat healthy food have HEI scores 1.9 points higher than those who agreed, and those who rated the healthfulness of their diets as fair, good, very good or excellent have HEI scores 2.6 points higher than those who rated their diets as poor. For respondents at 130-185 percent of the poverty level, HEI-FAFH is significantly different only for those who had tried to follow the MyPlate guidelines; that difference is large (8.3 points) but only weakly significant at the 10-percent level. For nonrecipient respondents below 130 percent of the poverty level, differences are weakly statistically significant at the 10-percent level for respondents who had heard of MyPlate (3.2 points) and for those who disagreed that healthy food tastes good (5.8 points).

These results suggest that while the priority placed on nutrition is associated with higher nutritional intake for some consumers, other factors are more important for food assistance households and low-income nonrecipient households. Further research is needed to explore the role of differences in the level of nutrition awareness across income and SNAP participation groups versus the binding constraint of income in choosing healthier food away from home.

[77]Significance tests indicate whether the difference in HEI-FAFH between "higher nutrition priority" respondents and "lower nutrition priority" respondents was significantly different from zero.

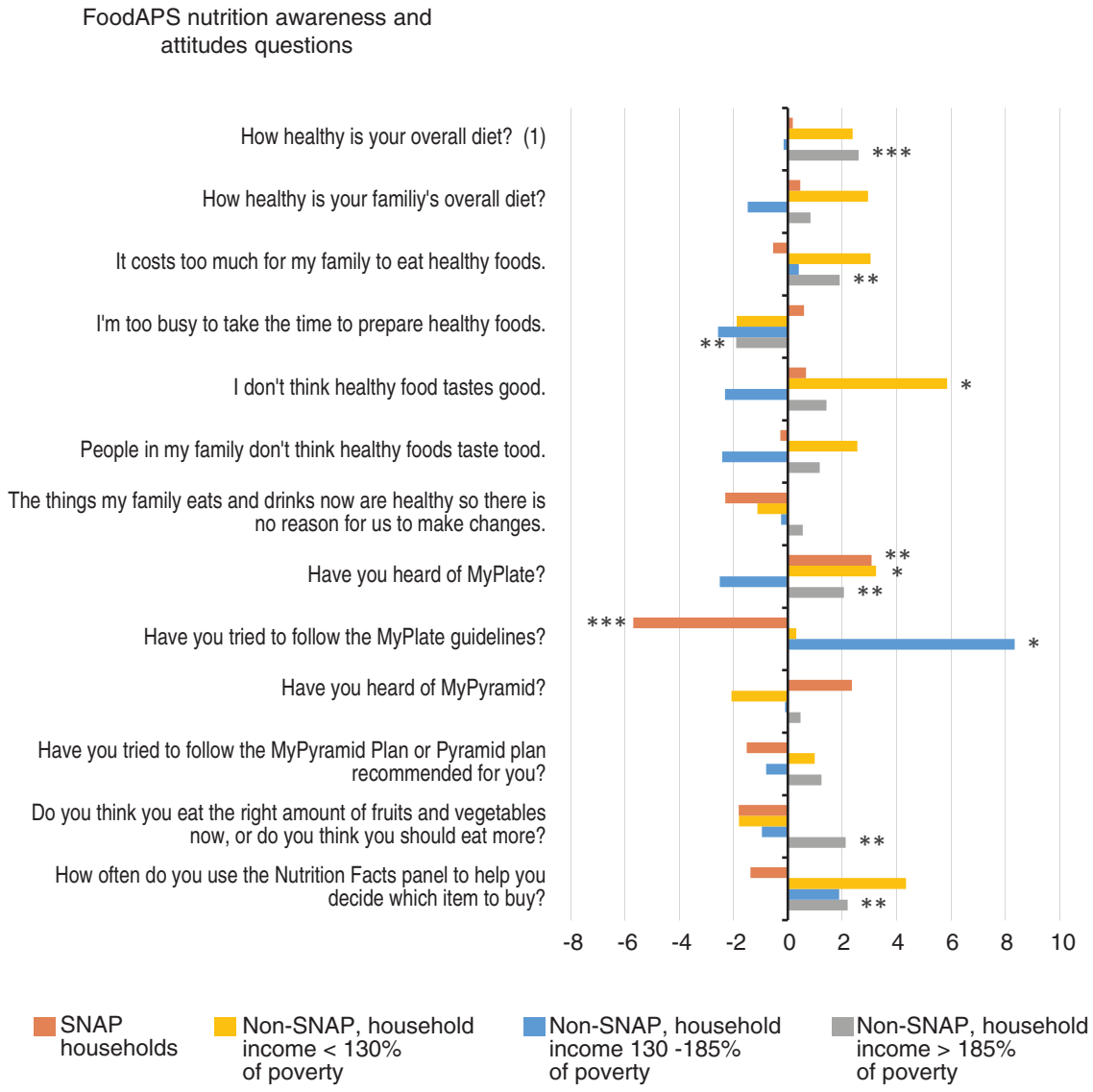
Measuring Nutrition Awareness and Attitudes in FoodAPS

FoodAPS includes several questions about respondents' attitudes toward healthy food and their awareness of the *Dietary Guidelines for Americans*, as represented by graphics developed to symbolize the structure of a healthy diet. The Food Guide Pyramid was introduced with the *1995 Dietary Guidelines*, depicting a triangle with grain products at the base to indicate the number of servings recommended for this group; fruits and vegetables at the next level up; followed by protein and dairy foods; and topped by fats, oils, and sweets, signifying that those should be used sparingly. The MyPyramid graphic developed as part of the *2005 Dietary Guidelines* depicted the number of recommended servings by vertical stripes and added a figure climbing stairs up the pyramid to signify the importance of adequate exercise. Most recently, the MyPlate graphic developed in 2011 by USDA depicts the recommendations as a plate split into areas representing healthy portions of each food group in a single meal. Because consumers have been exposed to multiple graphic representations of the *Dietary Guidelines*, FoodAPS included questions about each of the recent versions, along with other questions related to food preferences, time constraints, and cost concerns. The questions are listed below, with the answers counted as "higher nutrition priority" and "lower nutrition priority" indicated.

Question	Responses counted as lower nutrition priority	Responses counted as higher nutrition priority
Thinking only about yourself, in general, how healthy is your overall diet?	Poor	Fair, Good, Very Good, Excellent
In general, how healthy is your family's overall diet?	Poor	Fair, Good, Very Good, Excellent
It costs too much for (me/my family) to eat healthy foods.	Agree	Disagree
I'm too busy to take the time to prepare healthy foods.	Agree	Disagree
I don't think healthy foods taste good.	Agree	Disagree
People in my family don't think healthy foods taste good.	Agree	Disagree
The things that (I/my family) eat and drink now are healthy so there is no reason for (me/us) to make changes.	Disagree	Agree
Have you heard of MyPlate?	No	Yes
Have you heard of MyPyramid?	No	Yes
Have you tried to follow the MyPyramid Plan or Pyramid plan recommended for you?	No	Yes
Do you think you eat the right amount of fruits and vegetables now, or do you think you should eat more?	Right amount, eat less	Eat more
When choosing between different food items at the grocery store, how often do you use the Nutrition Facts panel to help you decide which item to buy?	Never seen	Sometimes, Always

Figure 9.5

Difference in average HEI-2010 scores for food away from home, higher nutrition priority responses versus lower nutrition priority responses, by SNAP participation status and income level



Note: Statistical tests are for whether the difference in HEI scores for "higher nutrition priority" and "lower nutrition priority" are different from zero, for each SNAP/income group. * = Significant at the 10-percent level. ** = Significant at the 5-percent level. *** = Significant at the 1-percent level. SNAP = USDA's Supplemental Nutrition Assistance Program. (1)Difference in average HEI-2010 for respondents who gave responses indicating "higher nutrition priority" versus "lower nutrition priority." See box, "Measuring Nutrition Awareness and Attitudes in FoodAPS," for classification of responses. 2010 Healthy Eating Index (HEI-2010) scores presented here provide a profile of foods, as purchased or acquired, relative to the *2010 Dietary Guidelines for Americans*, without adjustment for what portion of foods acquired during the observation week were consumed during the week.
Source: USDA, Economic Research Service estimates using National Household Food Acquisition and Purchase Survey, collected 2012 and 2013.

HEI-2010 for FAFH at School Versus Other FAFH

Food acquired at school had a significantly higher overall HEI-2010 score than did other FAFH (fig. 9.6). On average, total HEI-2010 is 49 for school-acquired food, compared to other food away from home, which is 46. This difference may be a conservative estimate, since the nutrient and food group databases used in FoodAPS may not completely capture special formulations for the school food market, such as whole-grain pizza crusts. Further, food acquired at school is most likely consumed by children, while other FAFH acquired by households with children could be consumed by adults or children.[78] Thus, the comparison cannot tell us how school food compares to other FAFH consumed by children, but it does shed light on other FAFH that children may be exposed to in households at each income level.

The higher HEI-2010 for school food is driven by significantly higher component scores for dairy, whole grains, whole fruit, and total fruit, which counterbalanced significantly lower scores for several other components (sodium, refined grains, fatty acids, seafood/plant protein, green vegetables/legumes, and total vegetables).[79] The findings in general are consistent with previous studies showing that participation in the NSLP (USDA's National School Lunch Program) increases participants' nutrient consumption and consumption of many, but not all, underconsumed foods (Gordon et al., 1995; Jaime and Lock, 2009). Mancino and colleagues (2018a) find that for SNAP households (but not for non-SNAP households), HEI scores for foods obtained at school are higher than for foods obtained at larger grocery stores.

Conclusion

Food away from home (FAFH) is of consistently lower nutritional quality than food at home (FAH) for households receiving SNAP—as well as for income-eligible nonparticipant households and higher income households. This suggests that the nutrition quality of food choices away from home are similar across the income spectrum, reflecting consumer preferences as well as the offerings made available by vendors in response to those preferences. HEI-2010 scores for FAFH are lower for SNAP recipient households, both with and without children, while the gap between nutritional quality of FAFH compared to FAH is lowest for SNAP recipient households, as nonparticipants had higher HEI-2010 scores for FAH. Also, school meals score contribute to a higher HEI for households with children than other types of FAFH, consistent with other studies finding participation in NSLP enhances participants' nutrient consumption.

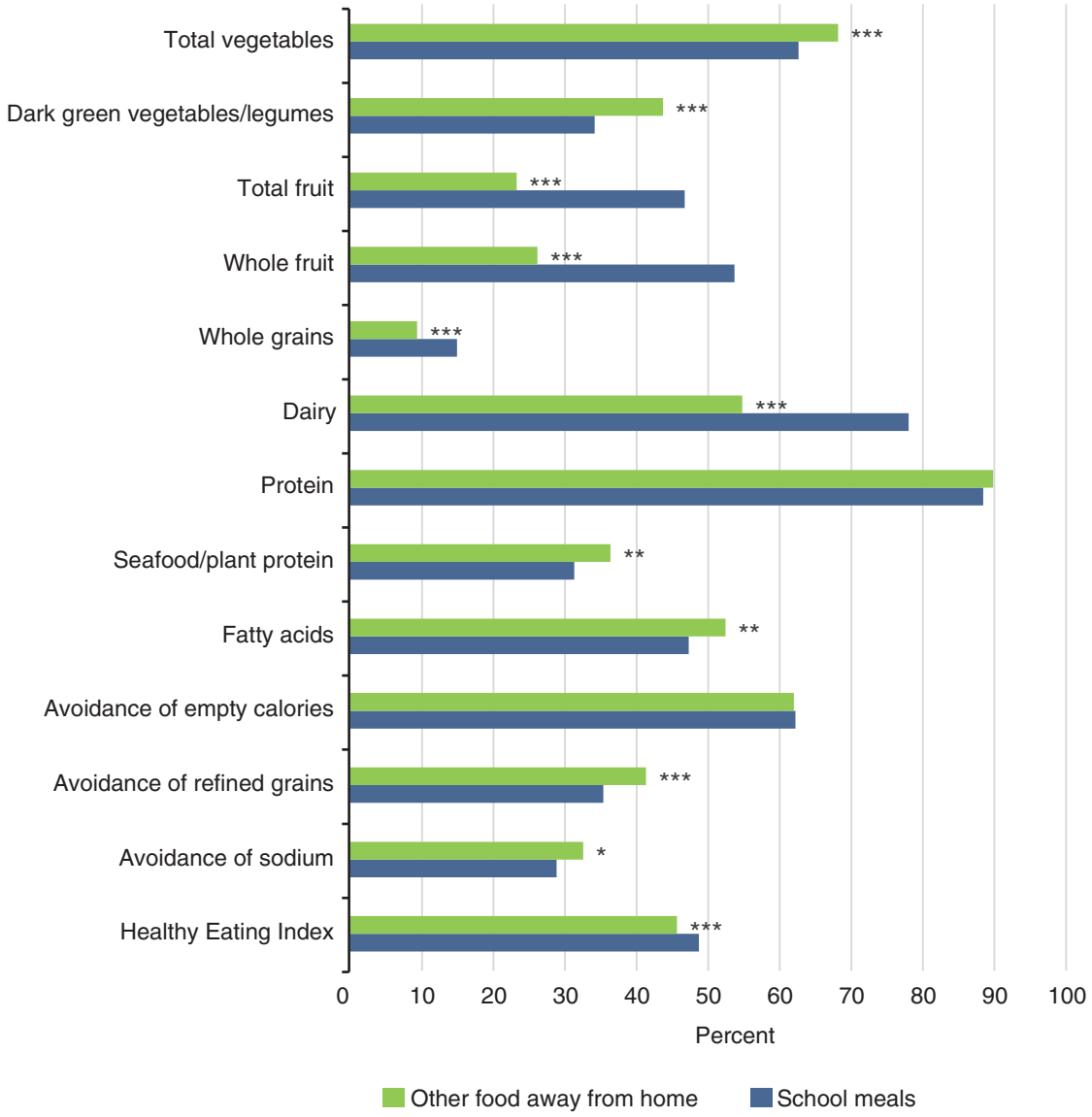
Some components of FAFH diet quality, such as saturated fat and fiber content, have improved over time, reflecting healthier choices by consumers and more nutritious options offered by vendors. Total fat content of FAFH decreased between 1977-78 and 2009-12 (see chapter 7). Menu labeling rules could be encouraging this trend as well (see chapter 10) as dining out is increasingly perceived as more of a staple for busy households instead of an occasional indulgence. The growth in higher quality FAFH options with the growth of fast-casual restaurants (see chapter 6) could improve the nutritional profiles of SNAP recipient households who do consume food away from home, even though they are unable to use SNAP benefits to do so.

[78]Food acquired at school includes all foods regardless of whether it was part of the school meal programs.

[79]Changes in school meal standards implemented in school year 2012-13, toward the latter part of FoodAPS data collection, stipulate low-fat or nonfat milk only, more fruits and vegetables, and more whole grains. HEI subcomponent scores for green vegetables/legumes and total vegetables would be expected to improve over time as student acceptance of healthier meals increases.

Figure 9.6

Food acquired at school and other food away from home: HEI-2010 and its subcomponents, as a percent of maximum, for households with children participating in USDA's Supplemental Nutrition Assistance Program (SNAP)



*= Significant at the 10 percent level. ** = Significant at the 5-percent level. *** = Significant at the 1-percent level.
Note: 2010 Healthy Eating Index (HEI-2010) scores presented here provide a profile of foods, as purchased or acquired, relative to the *2010 Dietary Guidelines for Americans*, without adjustment for what portion of foods acquired during the observation week were consumed during the week.
Source: USDA, Economic Research Service estimates using National Household Food Acquisition and Purchase Survey, collected 2012 and 2013.

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Chapter 10: Menu Labeling

Federal regulations implemented in 2018 require chain restaurants with 20 or more locations operating under the same name to make calorie information publicly available. To gauge how consumers and the restaurant industry may adapt to the new regulations, this chapter summarizes research that has examined consumer behavior in response to real-world and laboratory interventions that resemble aspects of the new regulations. Researchers have been unable to reach a consensus regarding how consumers and restaurants respond to menu labeling.

In chapter 9, purchases of food away from home (FAFH) were found to be associated with lower diet quality among food assistance recipients as well as higher income households. A new Federal policy that requires some restaurants to make calorie information publicly available is hoped to improve the healthfulness of foods consumed away from home by giving consumers information and nudging foodservice providers to offer more healthful food options. Chapter 10 details the evolution of this menu labeling requirement and its potential to affect FAFH.

Because of menu-labeling regulations, consumers can better identify lower calorie foods when eating out. After New York City in 2008 mandated that chain restaurants provide information about the caloric content of foods at the point of sale, several State, county, and municipal governments (including Philadelphia, PA; King County, WA; and Montgomery County, MD) followed suit with menu-labeling regulations of their own. In New York City, fast-food restaurants were required to post calorie information on menu boards, and full-service restaurants were required to print calorie information in their menus. Now, the U.S. Food and Drug Administration (FDA) has implemented Federal regulations that require chain restaurants and similar retail food establishments (such as convenience stores that sell FAFH) to make calorie information publicly available nationwide. These regulations apply to establishments that are part of a chain with 20 or more locations doing business under the same name.

The underlying premise of menu-labeling regulations is that giving consumers nutrition information will enable them to make informed choices, which may, in turn, lead to higher quality diets and healthier body weights. With the new information, consumers may order lower calorie meals at restaurants or reduce their caloric intake elsewhere to compensate for their restaurant calories. Menu labeling may also motivate the restaurant industry to improve the nutritional quality of their offerings.

Previous literature reviews and meta-analyses tend to focus more on consumers' response to menu labeling than on restaurants' response (VanEpps et al., 2016; Fernandes et al., 2016; Littlewood et al., 2015; Long et al., 2015; Krieger and Saelens, 2013; Burton and Kees, 2012). By contrast, the analysis presented in this chapter uses economic theory to better anticipate and understand the response of both consumers and restaurants to Federal menu-labeling regulations. Although interest generally pertains to nutrition-related menu labeling, the discussion presented here centers specifically on calorie labeling because that is what U.S. menu-labeling policy has focused on up to now.[80] Calories are just one component of human nutrition, as human nutrition encompasses a range of other components such as macronutrients (carbohydrates, proteins, fats) and micronutrients (vitamins, minerals).

[80]Menu-labeling regulations in the city of Philadelphia were one exception. Chain restaurants there had to post the total number of calories (rounded to the nearest 10 calories), grams of saturated fat, grams of trans fat, grams of carbohydrates, and milligrams of sodium per menu item as usually prepared and offered for sale.

Years of Debate Culminated in Passage of Menu-Labeling Regulations

Menu labeling represents the most significant overhaul of U.S. food-labeling laws since the Nutrition Labeling and Education Act (NLEA) of 1990. Under FDA regulations that are authorized by the NLEA, food manufacturers must place a Nutrition Facts panel on most packaged products. Included on this panel are the size of a serving, the number of servings in a package, and calories per serving, among other information. Variyam (2008) found that nutrition labels on packaged food products increased the fiber and iron intakes of label users compared with label nonusers. Though the problem of obesity in the United States worsened during the 1990s and 2000s despite implementation of the NLEA, Variyam and Cawley (2006) further find that label users gained less weight than nonusers.[81]

Unlike most food at home (FAH), however, when eating out, consumers were not guaranteed access to explicit nutrition information for all menu items. Prior to menu-labeling regulations, Federal law required restaurants only to support any nutrient content or health claims they made (FDA, 2006). For example, if a menu listed an entrée as "low fat," information about its fat content had to be available on request. Otherwise, barring any nutrient or health claims, disclosure of nutrient and calorie information was voluntary and did not have to appear on menus or menu boards.

Some restaurants did opt to provide calorie data prior to menu-labeling laws. According to Wootan et al. (2006), 72 percent of McDonald's outlets in Washington, DC, provided in-store nutrition information, and 59 percent provided it for a majority of items. This information appeared on tray liners, in pamphlets, on posters, or on one-page charts. However, it did not appear on menu boards, so to be informed, consumers had to research before ordering their food, which few consumers did. Roberto et al. (2009) observed consumers at eight outlets that were part of four major fast-food chains and found that less than 1 percent of all customers examined nutrition information that was available in the restaurant but positioned somewhere other than the point of sale. In 2004 and 2005, Saelens et al. (2007) inspected 217 restaurants in Atlanta, GA, and found that only 6.9 percent of fast-food outlets placed nutrition information directly on menu boards and only 5.2 percent of full-service restaurants printed nutrition information on menus.

When asked whether restaurants should provide more information about the caloric content of their foods, a majority of consumers have supported menu labeling, though their level of enthusiasm varies widely. On the one hand, five national polls conducted between 2003 and 2008 found that support for menu labeling ranged between 67 percent and 83 percent (Friedman, 2008). On the other hand, when Krukowski et al. (2006) surveyed consumers about whether they would use calorie information at restaurants if it were available, only about half reported they would do so. Moreover, using other national surveys conducted between 2007 and 2010, Gregory et al. (2014) found that willingness to use nutrition information at restaurants if such information "were readily available" was greater among people who already had healthier diets. Specifically, willingness to use nutrition information at restaurants was strongly correlated with a person's Healthy Eating Index (HEI) score, a measure of diet quality that assesses conformance to USDA's *Dietary Guidelines for Americans.* People who said that they would use nutrition information "often" in both fast-food and full-service settings had the highest average HEI scores, followed by those who said they would use it "sometimes." Both of these groups had higher scores than those who said that they would "never" use

[81]The result was statistically significant among only non-Hispanic white women. However, according to Variyam and Cawley's (2006) calculations, the benefits to this subset of the population alone were sufficiently large to outweigh the total cost of the NLEA.

nutrition information. (See box, "Americans Who Have Dark Green Vegetables Available at Home Are More Likely To Use Nutrition Information at Full-Service Restaurants.")

Proponents of menu labeling argued that providing explicit nutrition information at the point of sale would help consumers to choose healthier food options. In a study supported by the Center for Science in the Public Interest (CSPI), Backstrand et al. (1997) asked 256 dieticians to estimate the calories in five entrées sold by chain restaurants. The dieticians underestimated the calories in these foods by anywhere between 220 and 680 calories. Since dieticians guessed inaccurately, Backstrand et al. (1997) concluded that "the average consumer has little chance of accurately assessing the healthfulness of meals served in restaurants" (p. 2). The American Heart Association (AHA) also endorsed menu labeling as "an important part of a comprehensive approach to addressing our nation's obesity epidemic" (AHA, 2009).

Opponents of menu labeling countered with several arguments (e.g., Armstrong, 2008; Farley et al., 2009). Many feared that the costs to industry would be high. Critics also pointed out that many restaurants already provide nutrition information in-store or online. Moreover, doubt was cast on the helpfulness of menu labeling as a tool for reducing the incidence of overweight and obesity, since (it was argued) consumers can already identify more and less healthy meals, if they want. For example, the Center for Consumer Freedom (2007) stated, "We don't need government to tell us the difference between salad and a 12-piece bucket of chicken."

By the late 2000s, a number of State, county, and municipal governments were debating local menu-labeling policies. New York City was the first to implement regulations in 2008. According to Farley et al. (2009), who chronicled New York City's experiences implementing menu-labeling regulations, policymakers initially considered mandating information on calories, total fat, saturated fat, and sodium but, in the end, mandated only information on calorie counts because providing additional information "risked reducing the impact of the calorie information on obesity" (p. 5). Moreover, they reasoned that calories tend to be positively correlated with other nutrients, including fat and sodium. Over the next few years, the city of Philadelphia, Washington State's King County, Maryland's Montgomery County, and the State of California, among other jurisdictions, followed suit with menu-labeling regulations of their own. Using the 2007-08 and 2009-10 National Health and Nutrition Examination Survey, Gregory et al. (2014) found that 21 percent of fast-food patrons and 17 percent of full-service restaurant patrons saw nutrition information when they ate out—statistics that likely reflected data on establishments subject to menu-labeling laws as well as those that voluntarily provided nutrition information.

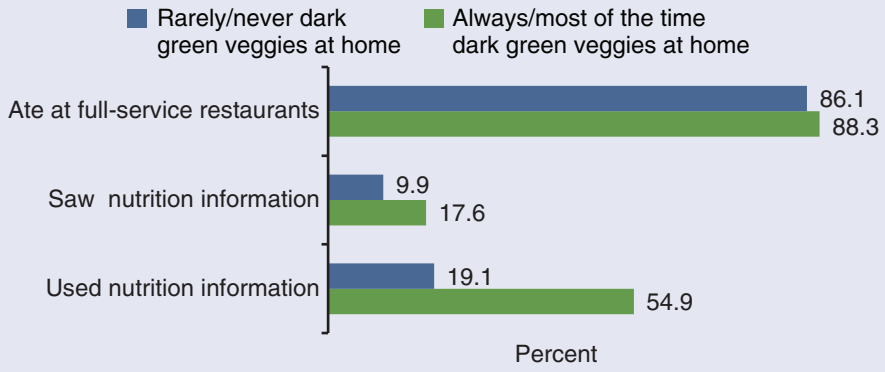
The fact that State and local governments were pursuing their own menu-labeling requirements was problematic for the restaurant industry. The National Restaurant Association (NRA), which advocates on behalf of foodservice providers, reported that requiring "nutrition information on a city-by-city or state-by-state basis creates a patchwork quilt of confusing and contradictory local regulations" (NRA, 2008). A coalition including the NRA, over 30 restaurant companies, and other organizations called for Federal legislation to replace State and local requirements with a uniform, national standard (NRA, 2008).

Americans Who Have Dark Green Vegetables Available at Home Are More Likely To Use Nutrition Information at Full-Service Restaurants

ERS researchers used data from the 2007-08 and 2009-10 National Health and Nutrition Examination Survey to examine who uses nutrition information in full-service restaurants (generally defined as restaurants with wait staff). They found that healthy-diet behaviors are correlated with use of nutrition information in full-service restaurants (FSRs). For example, people who consult nutrition facts labels on grocery store foods and who store healthy foods at home are more likely to use nutrition information on restaurant menus. Although people who reported "rarely" or "never" having dark green vegetables at home were as likely to go to FSRs as people who "always" or "most of the time" have these vegetables at home, the first group was less likely to see and use nutrition information on menus (box fig. 10.1). Among people who saw the nutrition information, just 19.1 percent of the group that "rarely" or "never" had dark green vegetables available at home said they used it, compared to 54.9 percent of those who said they "always" or "most of the time" had dark green vegetables available at home (Gregory et al., 2014).

Box figure 10.1

Awareness and use of nutrition information at full-service restaurants



Source: USDA, Economic Research Service analysis using National Health and Nutrition Examination Survey 2007-10 data.

Authority for developing Federal menu-labeling regulations as mandated in the ACA was given to FDA. In 2011, FDA issued a set of proposed rules. After considering approximately 900 comments from consumers, consumer groups, industry, and other organizations, FDA published its final regulations in the *Federal Register* in December 2014 (FDA, 2014).[82] Covered establishments have been required to comply with these regulations since May 7, 2018 (FDA, 2018).

Will Menu Labeling Lead to Changes in Consumer and Restaurant Industry Behavior?

As debate over the need for menu-labeling regulations heated up in the 2000s and as laws started taking effect in 2008, a growing number of researchers became interested in how consumers and restaurants respond to menu labeling. Much research now compares consumer behavior at restaurants that list calorie information on their menus versus restaurants that do not. Other studies investigate whether menu labeling influences restaurants to replace higher calorie menu items with lower calorie options. Before examining these studies, we briefly consider how consumers and restaurants might respond to menu labeling in theory. These theoretical results may prove useful for understanding the available evidence to date on how consumers and restaurants respond in practice and for guiding future research on the topic.

Theoretical Evidence on How Consumers and Restaurants Might Respond to Menu Labeling

In theory, providing nutrition information at the point of sale helps consumers to choose foods that better align with their overall preferences for taste, nutrition, weight control, and other attributes of a meal. Each of these attributes could affect a consumer's ultimate choice. In one study, Glanz et al. (1998) asked 2,967 people to rate the level of importance they place on different food characteristics using a scale of 1 (not at all important) to 5 (very important). Respondents placed the most importance on taste (4.7) followed by cost (4.1), nutrition (3.9), convenience (3.8), and weight control (3.4), on average. Consistent with this result, when Jones (2010) studied how customers make choices at restaurants, many participants in her focus group reported their intention to order tasty foods. One participant stated that it was okay to indulge at restaurants; from a menu with 11 items, she would order either a T-bone steak or chicken alfredo pasta, even when told that 6 other items were lower in calories. However, because the steak had fewer calories than the pasta, she would choose the steak: "Both of these things I never make at home, and it would really feel like an indulgence for me. But even among my indulgences, it might impact which indulgence I take" (p. 460).

Menu labeling may have the greatest effect on food choices when consumers had previously misjudged a food's true caloric content (e.g., Burton et al., 2006; Bates et al., 2009; Bollinger et al., 2011). In one study, Bollinger et al. (2011) analyzed transactions data provided by Starbucks, including sales data for New York City stores before and after the implementation of New York's menu-labeling laws. The researchers also surveyed customers at Starbucks restaurants to gauge their knowledge of the caloric content of various menu items. The "common presumption," according to Bollinger et al. (2011), "is that consumers will be surprised to learn how many calories are in the beverage and food items offered at chain restaurants" (p. 92). However, when the researchers examined how menu labeling affected sales trends for the 60 most popular menu items, they found that

[82]These regulations can be accessed online.

"the direction of the policy's effect depends on the direction of the surprise" (p. 92). Menu labeling had no major effect on *beverage* choices since consumers had previously overestimated the caloric content of these menu items. "For instance, a 16 oz vanilla latte has a relatively high 250 calories, and we estimate calorie posting causes a small relative increase in its sales—which seems counter-intuitive. But consumers may have previously believed a vanilla latte had even higher calories, and were thus surprised to learn it had only 250," reported Bollinger et al. (2011, p. 106). By contrast, menu labeling did have a negative effect on sales of *food* items for which consumers had underestimated caloric content. (Food items at Starbucks included cookies, muffins, bagels, scones, brownies, and doughnuts.)

The "direction of surprise" idea is echoed by Krieger and Saelens (2013), who summarize the state of research on menu labeling and conclude that the effect of labeling may vary across menu items. They explain: "For example, if deli sandwiches are perceived as generally lower in calories than burger items, but are actually similar calorically, the evidence suggests that sandwich purchases would decrease more relative to burger purchases after menu labeling that shows their similar caloric content" (Krieger and Saelens, 2013, p. 5).

Given that prior nutrition knowledge affects a consumer's response to menu labeling, Stewart et al. (2014, 2015) investigated what consumers could likely figure out on their own in the absence of menu labeling. Building on research in behavioral economics, Stewart et al. (2014, 2015) assumed that consumers use "rules of thumb" to make inferences about products when those products do not come with explicit nutrition information. For example, a consumer may know to seek out meals rich in fruits and vegetables and avoid fat-laden side dishes, like French fries and onion rings, in order to reduce the number of calories consumed. Detailed information was collected on 361 meals sold by two fast-food chains and 5,752 meals sold by six full-service restaurant chains. Results showed that consumers who understand some basic rules-of-thumb nutrition knowledge outlined by the AHA and the National Heart, Lung, and Blood Institute (NHLBI) can discriminate fairly well between meal options with substantial differences in the number of calories.[83] However, if faced with two meals that differ by less than 200 calories, the same consumers have only about a 50 percent chance of correctly identifying the lower calorie option (i.e., equivalent to guessing), suggesting that the rules of thumb identified by the AHA and the NHLBI have little discriminatory value in this range. Stewart et al. (2014, 2015) concluded that, while many Americans may be able to make crude choices between low- and high-calorie foods based on their own nutrition knowledge, menu labeling will allow them to refine their choices.

In addition to helping consumers identify lower calorie meals at restaurants, menu labeling may help consumers eat healthier diets in other ways. For example, the succinct statement about an individual's daily energy needs required by the ACA may help consumers better understand how a particular restaurant meal fits within their daily caloric needs. Some people may be motivated to order lower calorie foods or, perhaps, order fewer (sugar-filled and therefore caloric) soda refills. Others may decide to compensate for calories consumed at a restaurant by eating less throughout the day. Still others may consume only a portion of their meal at the restaurant and bring the rest home in a "doggie bag" to eat in place of another meal.

[83]The AHA and the NHLBI identify a number of characteristics of restaurant foods likely associated with caloric content. See AHA (2013) and NHLBI (1998).

In theory, menu labeling could also motivate restaurants to offer lower calorie foods. Based on the findings of Burton et al. (2006), Bates et al. (2009), and Bollinger et al. (2011), lower calorie choices may represent reformulations or replacements of menu items for which consumers had previously underestimated caloric content. For example, Starbucks may not reformulate its beverages (whose caloric contents consumers tended to overestimate (Bollinger et al., 2011)), but the company might change its food offerings (some of whose caloric contents consumers tended to underestimate).

However, in other ways, menu labeling could actually serve to increase calories consumed. Economists have long recognized that health and nutrition policies, like menu labeling, that aim to reduce the rates of obesity and overweight can have surprising, unintended consequences (Kuchler et al., 2005; Variyam, 2005; Burton and Kees, 2012). In the case of menu labeling, some unintended consequences that might occur include the following:

1. Some people might be underestimating their daily energy needs, and exposure to a statement recommending 2,000 calories per day for a representative consumer might inadvertently promote overconsumption (e.g., VanEpps et al., 2016).

2. Some people may seek out high-calorie menu items, believing that those foods will taste better (e.g., Raghunathan et al., 2006).

3. Restaurants may reduce the price of less healthful foods in order to keep sales strong (a possibility mentioned in Variyam (2005)).

4. Restaurants may use extra-high-calorie menu items for "anchoring." That is, restaurants could offer some very high-calorie options in order to make their other menu offerings seem low-calorie by comparison.

These and other potential mechanisms that produce unintended consequences could offset some of the positive effect that menu labeling is theorized to have on consumer health.

The Empirical Evidence to Date on How Consumers Respond to Menu Labeling

In practice, it remains unclear how consumer behavior changes in response to menu labeling. This is because—even though much research has been done—published studies reach mixed conclusions. According to Long et al. (2015), who conducted a meta-analysis of 19 published studies, menu labeling "may lead consumers to purchase slightly fewer calories" (p. e11). VanEpps et al. (2016) conducted a review of 16 published studies and similarly concluded that "…the evidence regarding menu labeling is mixed, showing that labels may reduce the energy content of food purchased in some contexts, but have little effect in other contexts." The following subchapters review the results of (1) experimental studies conducted in laboratory settings, (2) observational studies conducted in fast-food restaurants, and (3) observational studies conducted in full-service restaurants. Challenges and directions for future menu-labeling research are discussed.

Laboratory Experiments

To gauge the effect of restaurant menu labeling on consumer behavior, several researchers have designed laboratory experiments in which they attempted to simulate a real-world environment while also controlling for potentially confounding factors. Among these studies, Roberto et al.

(2010) served meals to 303 participants in a university classroom. Each participant received one of three possible treatments: (1) a menu with no calorie information; (2) a menu with numeric calorie information; or (3) a menu with numeric calorie information and a succinct statement that read, ''The recommended daily caloric intake for an average adult is 2000 calories.'' Menu items included salads, sandwiches, wraps, mozzarella sticks, French fries, pizza, hamburgers, desserts, and beverages, among other things. Researchers then observed the number of calories each participant ordered and consumed. Participants also returned the following day for a dietary recall interview during which they reported all foods consumed during the evening hours immediately after the study. Participants consumed 177 fewer calories during the experiment, on average, if they had received either type of menu with calorie information. However, consumers who received only numeric calorie information consumed more calories later in the day, so their total daily energy intake was similar to that of study participants who had received no calorie information. Only participants who had received both numeric calorie and supplementary information about their daily energy needs consumed fewer calories over the course of the day.

In another experimental study, Harnack et al. (2008) served meals to 594 participants. Each participant received a paper menu similar in format to menu boards at fast food restaurants. Menu items included hamburgers, chicken entrées, fish entrées, salads, French fries, beverages, and desserts. Some, but not all, menus included calorie information. For each participant, study staff then recorded whether the menu included calorie information as well as the foods ordered and consumed. Harnack et al. (2008) found no significant difference in the energy composition of meals consumed by participants who received menus with and without calorie information. The study did not investigate whether providing study participants with a succinct statement about their daily energy needs could influence results.

Studies Conducted in Fast-Food Restaurants

Other studies have observed the food choices of patrons at fast-food establishments with and without menu labeling. Many of these studies were natural experiments conducted in parts of the country like New York City and King County, WA, before and after the implementation of local menu-labeling laws.

Among the earliest and largest studies to focus on consumer behavior at fast-food restaurants, Bollinger et al. (2011) analyzed transactions data provided by Starbucks, including sales data for New York City stores before and after the implementation of menu-labeling laws there. As described earlier, menu labeling had a negative effect on sales of food items for which consumers had previously underestimated caloric content. Sales of beverages were unaffected. Overall, Bollinger et al. (2011) found that customers ordered 14 fewer calories per transaction as a result of calorie information.

Downs et al. (2013) and Wisdom et al. (2010) are the only analyses of customer behavior at fast-food restaurants to investigate the effects of providing both numeric calorie information and a succinct statement about daily energy needs. Wisdom et al. (2010) find that participants in their study who received both types of information ordered almost 100 fewer calories, on average—but they also found that menu labeling had a greater effect on non-overweight than overweight individuals.

In another analysis of customers at fast-food restaurants, Downs et al. (2013) studied the patrons at two McDonald's restaurants located in New York City—one in Manhattan and another in

Brooklyn—including 624 patrons 2 months before and another 497 patrons 2 months after the city implemented its local menu-labeling regulations. Customers approaching the restaurants at lunchtime were randomly assigned to one of three treatments: (1) handed a slip with information about an individual's daily energy needs (2,000 calories for women or 2,400 for men); (2) handed a slip with recommended per-meal calories (650 calories per meal for women or 800 for men); or (3) given no recommendation (control condition). Study staff then asked exiting customers to provide their receipt and participate in a survey. Downs et al. (2013) found no evidence that consumers ordered fewer calories after the implementation of menu-labeling laws in New York City in 2008 than before. Moreover, they found no evidence that providing consumers with a succinct statement about daily energy needs affected food choices in either time period (i.e., in the time periods in which there was an absence or presence of calorie counts on menu boards).

Similar to Downs et al. (2013), both Cantor et al. (2015) and Elbel et al. (2009) found no evidence that menu labeling at fast-food restaurants reduces calories purchased.

Studies Conducted in Full-Service Restaurants

A smaller number of studies gauged the effect of restaurant menu labeling on consumer behavior at full-service restaurants. Among these studies, Auchincloss et al. (2013) found that consumers at a full-service restaurant ordered 155 fewer calories. Pulos and Leng (2010) found that consumers at six different full-service restaurants chose entrées with 15 fewer calories. However, Ellison et al. (2013, 2014) found no evidence that providing calorie information at the point of sale alone reduced the caloric content of consumers' orders.

Heuristic Devices for Delivering Calorie Information

Because of the mixed findings of studies that evaluate the effect of menu labeling on consumer behavior, health and nutrition researchers have considered alternative strategies for delivering calorie information (e.g., Dowray et al., 2013; Ellison et al., 2013; Ellison et al., 2014; Larrivee et al., 2015). At a full-service restaurant on the Oklahoma State University campus, Ellison et al. (2013, 2014) presented menus to customers. Some customers received no calorie information. Others received menus with numeric calorie information as mandated in the ACA. Finally, a third group received menus on which green, yellow, and red symbols were positioned next to numeric calorie information for low-, mid-, and high-calorie entrées, respectively. The researchers also asked customers to complete a survey, which revealed that adding the color-coded "traffic light" signals may have reduced some consumers' caloric intake, relative to the other menu formats. However, not all customers appreciated the added symbols. According to Ellison et al. (2013, p. 7) "...diners may want more information on their menus (the number of calories) but do not want to be told what they should or should not consume (i.e., green = good, red = bad)."

Future Research

A challenge for future research will be to control for the large number of factors that can cause researchers to arrive at vastly different conclusions, including the likelihood that menu labeling may affect different segments of the population differently. On the one hand, Gregory et al. (2014) found that willingness to use nutrition information at restaurants has been greater among people who already have healthier diets. Block and Roberto (2014) similarly questioned whether "calorie labeling increases disparities among those with lower numeracy and health literacy" (p. 888). On

the other hand, Ellison et al. (2013) found that more-informed consumers may stand to learn less new information. Some people may already understand fairly well which foods are low and high in calories. Such people are less likely to be surprised by menu labels and, in turn, are also less likely to make different choices. Moreover, whether demand increases or decreases for a menu item may depend on the direction of any surprise (Bollinger et al., 2011).

Instead of focusing on Americans' restaurant eating behavior, another possible approach would be to investigate the effect of menu labeling on consumers' health status (Deb and Vargas, 2016; Restrepo, 2016; Restrepo, 2017). This approach echoes that of Variyam and Cawley's (2006) study of individuals' body mass index (BMI) before and after implementation of the NLEA. For example, Restrepo (2016, 2017) used data from the nationwide Behavioral Risk Factor Surveillance System (BRFSS). Participants in this survey report their height and weight along with information about their income and demographic characteristics. For his study, Restrepo (2016, 2017) used data on 103,220 individuals living in 62 counties in New York, New Jersey, and Pennsylvania between 2004 and 2012. New York City and six surrounding counties implemented menu-labeling regulations between 2008 and 2010. Restrepo (2016, 2017) combined this BRFSS data with county-level information on the timing of those laws. He then compared changes over time in the BMI of individuals living in jurisdictions with and without menu-labeling regulations. For his main empirical analysis, Restrepo (2016, 2017) modeled an individual's weight status as a function of his or her income, demographic characteristics, and menu-labeling policies in the individual's county of residence, among other potential weight determinants. The analysis concluded that, on average, providing point-of-purchase calorie information in chain restaurants reduced BMI by 1.5 percent and lowered the risk of obesity by 12 percent in jurisdictions with such laws.

Future research investigating the link between menu labeling and the health status of consumers may benefit from the National Health and Nutrition Examination Survey (NHANES), conducted by the Centers for Disease Control and Prevention. NHANES consists of a series of initial interviews, usually conducted at the respondent's home, along with a subsequent health examination completed at an NHANES Mobile Examination Center (MEC). Since 2007, the Economic Research Service has fielded the Flexible Consumer Behavior Survey module (FCBS) as part of NHANES. FCBS questions appear within the NHANES household interview as well as within a telephone interview that is administered 3 to 10 days after the MEC appointment. The FCBS asks about respondents' food shopping and spending habits as well as the frequency with which respondents cook meals at home and eat fast food and food at full-service restaurants, among other topics. Questions asked of respondents include[84]:

- Whether they have eaten away from home (at fast-food/pizza or full-service restaurants) in the last 12 months;
- If so, whether they saw nutrition information on the menu on the last visit to one of these places;
- If they saw nutrition information, whether they used it in deciding which foods to buy; and

[84]The questions listed here were added to the FCBS in the 2007-08 NHANES cycle, but they have not appeared in every single cycle since. NHANES cycles run continuously, in nonoverlapping 2-year periods—for example, 2007-08, 2009-10, 2011-12, and so on.

- How likely would they be to use nutrition information when eating out in the future if such information were readily available.

Using these data, researchers can compare the characteristics of consumers who do and do not use nutrition information when they eat out, as was done by Gregory et al. (2014).

The Empirical Evidence to Date on How Restaurants Respond to Menu Labeling

As with analyses of consumers' responses to menu labeling, a large body of research investigates the restaurant industry's response (Bollinger et al., 2011; Bruemmer et al., 2012; Saelens et al., 2012; Bauer et al., 2012; Namba et al., 2013; Wu and Sturm, 2014; Deierlein et al., 2015; Bleich et al., 2015; Bleich et al., 2016), though most of these studies appeared several years after similar research on consumers. In theory, if consumers demand more lower calorie choices after the advent of menu labeling, restaurants may choose to reformulate or replace existing menu items.

In one of the first studies in this area, Bruemmer et al. (2012) investigated the menus of 37 chain restaurants in King County, WA, which enforced local regulations in 2009. Detailed information about menu items was collected 6 months after and 18 months after the local law's implementation. Both fast-food establishments and full-service restaurants were included in the study. The authors first examined entrées that were offered in both time periods, and found that the average energy content of surviving menu items was 41 calories lower at the time of the 18-month followup across all 37 chains, presumably due to menu item reformulations. However, when the researchers expanded the scope of their analysis to consider new and discontinued foods along with surviving menu items, they found that only full-service restaurants were offering less calorie-dense foods overall. No change was detected for fast-food restaurants, so the effect of menu labeling might have been less pronounced at fast-food restaurants. Nonetheless, Bruemmer et al. (2012) concluded that menu labeling may ultimately benefit all consumers. They reasoned that lower calorie entrées and side dishes offer everybody—not just consumers who read and use nutrition labels—healthier options when dining at full-service restaurants.

In another study, Namba et al. (2013) identified changes over time in the menus of nine fast-food chain restaurants between 2005 and 2011, investigating whether each restaurant chain offered lower calorie foods in 2011 than in 2005. They also tested whether a greater proportion of each restaurant's menu items could be considered "healthier" in 2011 than in 2005. The authors defined "healthier" menu items based on the foods' calories, cholesterol, sodium, saturated fat, and fiber in the context of USDA's dietary guidance for individuals on a 2,000-calorie reference diet. Among the nine chain restaurants examined for the study, five operated in jurisdictions subject to menu-labeling requirements before 2011 and served as the experimental group. Four chains with no outlets in affected areas served as the control group. On the one hand, Namba et al. (2013) find that healthier food options increased from 13 percent to 20 percent of all menu items at experimental locations while remaining static at control locations. On the other hand, they find no improvement in the average caloric content of menu items at either experimental or control restaurants. Two of five chains in the experimental group reduced the average caloric content of their offerings. However, a few chains launched new options, such as bacon cheeseburgers, that increased average calories on their menus.

Similar to the previously discussed research on consumer behavior, results have been mixed on the question of whether menu labeling prompts restaurants to offer lower calorie foods. One reason for

the mixed results may be that researchers examined different samples of restaurants. Indeed, none of these studies could claim to have examined a nationally representative sample of the foodservice establishments that will be affected by menu labeling. In addition, studies used different survey methodologies. For example, some researchers have based their analysis on a comparison of only entrées without accounting for the fact that entrées are generally sold with other menu items like side dishes. In addition to the studies cited above, for example, Bruemmer et al. (2012) and Wu and Sturm (2014) investigated full-service restaurants, but focused on individual menu items without fully accounting for how entrées and side dishes were combined to produce meals. Thus, their approach did not fully reflect the array of choices consumers face.

To better account for the array of choices that a consumer faces when ordering foods at a restaurant, the analysis conducted in this chapter is based on information collected on the meals available at six restaurants by visiting company websites and brick-and-mortar venues (all data were publicly available[85, 86]) in spring 2012 and again in fall 2015 (Stewart et al., 2014, 2015). The empirical analysis identified all dinner entrées available at all six restaurants along with all possible combinations of standard side dishes for both time periods.[87] A steak entrée, for example, may come with a choice of 2 side dishes, and if customers can select those 2 sides from a list of 5 possibilities, then there would be 10 different combinations of 2 side dishes and the steak entrée. For the present chapter, each of these 10 combinations is treated as a separate meal, and each combination's caloric content is estimated. Previous studies have not followed this method. Finally, as other studies in the literature have done, the caloric content of meals at the six restaurants are compared during the two different time periods. Defining meals broadly to include dinner entrées with all possible combinations of standard side dishes, no evidence was found that these six restaurants were collectively offering less calorie-dense meals overall in 2015 than in 2012. (See box, "Restaurants May Be Offering Lower Calorie Meals, But the Evidence Is Mixed.")

While this comparison of spring 2012 and fall 2015 menus from six full-service restaurants more accurately accounts for the array of food choices a consumer faces when ordering a restaurant meal, it, like other studies, has significant limitations. Seasonal differences in menu items, for one thing, could affect our results. For another thing, our results were drawn from a small sample of restaurants that is not representative of all full-service establishments (let alone all fast-food restaurants) that will be covered by Federal menu-labeling regulations mandated by the ACA and being developed by FDA.

[85]The data were collected in Montgomery County, Maryland. Complete calorie information was obtained for all standard menu items, as compliance with local labeling laws has been mandatory there since January 1, 2011.

[86]One of the six full-service restaurants examined for this chapter had gone out of business since Spring 2012, so instead, calorie information was collected for another restaurant belonging to the same chain located in neighboring Frederick County, MD. However, the key results were unaffected if the analysis included only the menus of the five restaurants that were in business in Montgomery County, MD, during both time periods.

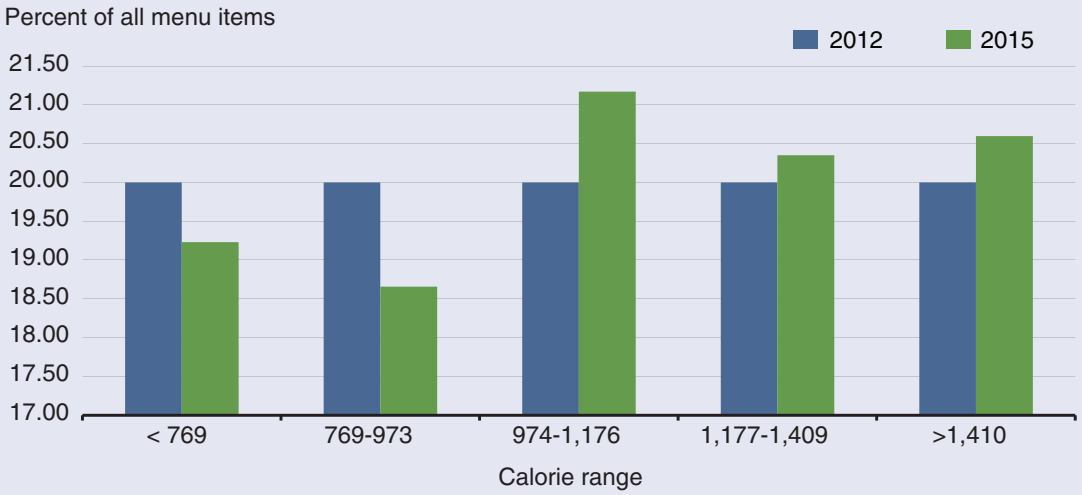
[87]The analysis included only side dishes that came with an entrée at no additional cost. Add-on items for which customers had to pay extra were excluded.

Restaurants May Be Offering Lower Calorie Meals, But the Evidence Is Mixed

A growing body of research investigates the restaurant industry's response to menu labeling. In theory, if consumers demand more lower calorie choices, then restaurants might reformulate or replace higher calorie menu items. However, the empirical evidence is mixed. Bruemmer et al. (2012) found that full-service restaurants have been offering less calorie-dense foods overall, but found no change for fast-food restaurants. In another study, Namba et al. (2013) found that "menu labeling has thus far not affected the average nutritional content of fast-food menu items, but it may motivate restaurants to increase the availability of healthier options" (p. 1).

Box figure 10.2

Calories in menu items available, 2012 versus 2015



Data are for meals available at six full-service chain restaurants. Calories in menu items were initially recorded using the restaurants' websites. Stores were later visited to confirm that online information was accurate. Each meal represents an entrée and any standard side dishes (i.e., side dishes available at no extra charge). Total calories account for those in the entrée and the side dishes, but do not account for calories in beverages, desserts, and other extra foods.
Source: Collected by USDA, Economic Research Service from publicly available sources.

For chapter 10, the analysis investigated the restaurant industry's response to menu labeling by focusing on the caloric content of meals sold by six full-service restaurants (FSRs) in Montgomery County, MD, in spring of 2012 and fall of 2015. We collected data on the meals at these chain restaurants by visiting company websites and stores in Montgomery County, MD—all data were publicly available.[88] ERS researchers identified each dinner entrée along with all possible combinations of standard side dishes. Each of these combinations was treated as a separate meal, and each meal's caloric content was estimated. This method accounts for the array of choices a consumer might face at an FSR. However, the method gives greater weight to restaurants that offered more menu items and more flexibility in customizing. Indeed, among the 6 FSRs examined, 1 allowed customers to create their own cheeseburger meal by choosing—at no additional charge—1 of 7 types of cheese, 1 of 6 types of spread (e.g. mayonnaise, relish, etc.), and 2 of 10 different toppings (e.g., bacon, avocado, etc.).

[88]Complete calorie information was obtained for all standard menu items since compliance with local labeling laws has been mandatory in Montgomery County, MD, since January 1, 2011.

Excluding create-your-own menu options like the cheeseburger meals described above, the analysis identified 5,227 meals sold by the six FSR chains in spring 2012 and 3,661 meals sold by the same six chains in fall 2015. Following previous researchers, distribution of calories in the meals available in both time periods is examined. In spring 2012 (box fig. 10.2), 20 percent of all meals had fewer than 769 calories (versus 19.2 percent of all meals in 2015) and 20 percent had 1,410 or more calories (versus 20.6 percent in 2015). Thus, there is no evidence that low-calorie meals represented a greater share or high-calorie meals represented a smaller share of all meals collectively sold by these six restaurants. Moreover, when the scope of meals under study is expanded to include create-your-own options (more of which became available after spring 2012), 33.1 percent of menu items have 1,410 or more calories in fall 2015 versus 20 percent in spring 2012. This result primarily reflects the aforementioned create-your-own cheeseburger option, which was available at one of the six FSRs in fall 2015, but not in spring 2012.

Ongoing research in this area will likely benefit from the wealth of information now available online and in-store about the caloric content of restaurant foods. However, in order to identify whether restaurants are adjusting their menus, it may also be necessary to account for how menu labeling may affect (or not affect) sales of menu items, depending on consumer expectations. For example, if a bacon cheeseburger meal is high in calories, but consumers were already aware of this fact, then menu labeling may not reduce demand for such items nor deter restaurants from offering them. In future research that builds on Stewart et al. (2014, 2015), researchers might proceed by investigating how well "rule of thumb" nutrition knowledge predicts the caloric content of meals. Or, following Bollinger et al. (2011), researchers might survey restaurant patrons, asking them to estimate the number of calories they expect various menu items to contain. It would then be possible to test whether restaurants were more likely to reformulate or replace menu items with substantially more calories than patrons expected.

Conclusion

After years of debate over menu labeling, Federal regulations require chain restaurants and similar retail food establishments with 20 or more outlets to make calorie information publicly available. The underlying premise of these regulations is that providing consumers with nutrition information will enable them to make informed choices, which may, in turn, lead to higher quality diets and healthier body weights. However, researchers have yet to reach a consensus on how consumers and restaurants are responding to menu labeling, and further analysis is needed. Until more is known, researchers, health policy advocates, and policymakers alike may want to exercise caution when drawing conclusions from existing research about the effect of menu labeling.

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Glossary

American Recovery and Reinvestment Act of 2009 (ARRA)	A Federal stimulus package enacted in February 2009 in response to the Great Recession (2007-2009). Its primary purpose was to promote job creation and provide temporary relief for constituents most affected by the recession and to invest in infrastructure, education, health, and renewable energy.
Baby Boomers	A demographic cohort that is defined by the Pew Charitable Trust as being born between 1946 and 1964.
Bennett's law	A principle stating that, as an individual's income rises, the proportion of starchy foods he or she consumes falls.
body mass index (BMI)	A measure used to indicate an individual's body composition as a function of his or her weight and height. BMI is equal to mass (kg)/height (m squared).
calorie	A unit of energy typically used to measure the amount of energy in food. One calorie is the amount of energy needed to raise the temperature of 1 cubic centimeter of water 1 degree Celsius.
chain (restaurant)	A restaurant business with multiple locations.
cup equivalent	A unit of measure that standardizes the amounts of foods from each food group with similar nutritional content, because foods vary in their caloric density.
diet quality	The nutritional quality of one's overall diet, which is typically measured by a diet quality index such as the Health Eating Index (HEI) (see definition).
Dietary Guidelines for Americans (DGA)	Guidelines put forth every 5 years by the U.S. Department of Health and Human Services and the U.S. Department of Agriculture that provide nutritional advice for Americans. The guidelines are based on scientific research and are used to inform nutritional policies and programs.
disposal personal income (DPI)	Amount of money households have available for spending and saving after income taxes are deducted.
economic downturn	A sustained period of sluggish economic activity characterized by are rising unemployment, declining housing prices, and declining investment.
economies of scale	The reduction in per-unit cost as a result of an increase in total production of an output.
Engel curve	A graphical depiction of expenditure of a good or service with respect to income.
Engel's law	The observation that as income increases the proportion of income spent on food decreases.
fast casual	As a subgroup of quick-service restaurants, fast-casual restaurants offer mainly just counter service. However, they approximate qualities of ambiance and food typical of full-service restaurants.

fast food	Used interchangeably with *quick service* and *limited service* to denote restaurants that offer counter service but do not have wait staff that continually tend to customers.
Federal Poverty Income Levels (FPL)	Also known as the Federal Poverty Guidelines, FPL are thresholds of annual household income adjusted yearly by the Department of Health and Human Services to determine poverty status. FPL are used to determine eligibility for certain Federal programs. FPL charts show thresholds by number of family members and by region (i.e., 48 contiguous States and Washington, DC; Alaska; and Hawaii).
food acquisition	Refers to the procurement of food through monetary or nonmonetary means.
Food at home (FAH)	Foods that are prepared at home, to be consumed at home.
Food away from home (FAFH)	Food that is prepared and consumed away from home. From a research perspective, there are definitional nuances to the categorization of food away from home by dataset. Please refer to table 1.2 for further details.
food basket	A collection of consumer market prices of a selection of food items.
food insecurity	A state of having unpredictable access to food. Depending on the severity of insecurity, it may lead to change in diet quality and food intake.
full service	A full-service restaurant has wait staff who cater to patrons while they are dining.
Great Recession	A period of worldwide contraction in the business cycle that largely resulted from a decline in the U.S. real estate market because of subprime mortgage lending practices. The National Bureau of Economic Research declared the official timespan of the recession as December 2007 to June 2009.
Healthy Eating Index (HEI)	A measure originally created by USDA, Center of Nutrition Policy and Promotion (CNPP) with subsequent collaborative updates to the measure from the National Cancer Institute. The HEI is updated every 5 years and is used to measure diet quality and adherence to USDA's Dietary Guidelines for Americans (see definition).
insulin resistance	A condition in which cells respond abnormally to the hormone insulin. The condition is highly associated with obesity, low diet quality, and a sedentary lifestyle.
limited service	Used interchangeably with *fast food* and *quick service* to denote restaurants that offer counter service but do not have wait staff who continually tend to customers.
Millennials	A demographic cohort that is defined by the Council of Economic Advisers as being born between 1980 and 2004.
North American Industry Classification System (NAICS)	A classification system used to categorize businesses for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.

National School Lunch Program (NSLP)	USDA, Food and Nutrition Service's meal program operating in public and nonprofit private schools and residential child care institutions that provides nutritionally balanced, low-cost or free lunches to children each school day.
nonmarket work	Typically, household production activities such as meal preparation but broadly refers to any activities or work that is not compensated by monetary wages.
obesity	A classification of adiposity, which is generally determined by one's body mass index (BMI) (see definition). A BMI of 30 or higher is considered obese.
off-premise foods	Foods that are intended to be consumed at home and considered food at home (FAH) in the Food Expenditure Series.
on-premise foods	A retailer-determined classification, on-premise foods are those intended to be consumed where they are prepared and acquired, whether at a restaurant, store, school, or home of family or friends. In the Food Expenditure Series, on-premise foods are the same as FAFH.
overweight	A classification of adiposity. Generally, overweight is determined by one's body mass index (BMI). A BMI between 24 and 29.9 is considered overweight.
personal consumption expenditure (PCE)	A measurement of consumer spending on goods and services in the U.S. economy that gives an indication of how much household income is allocated for current spending versus savings for future consumption.
perfectly inelastic	An economic situation in which the demand for a good or service is unchanged by any change in price.
prepared foods	Foods that require only heating or thawing before consumption.
price elasticity	A measure used to show the responsiveness (or elasticity) of the demand for a good to a change in its price when nothing but the price changes.
quick service	Used interchangeably with *fast food* and *limited service*, *quick service* denotes restaurants that offer counter service but do not have wait staff that continually tend to customers.
raw ingredient	A minimally processed, often single-ingredient food, generally used to produce a meal or snack.
ready-to-heat foods	A type of prepared food that requires only heating prior to consumption.
School Breakfast Program (SBP)	Administered by USDA, Food and Nutrition Service, SBP provides monetary assistance to States to operate nonprofit breakfast programs in schools and residential childcare institutions.
Special Supplemental Nutrition Program for Women, Infants and Children (WIC)	Administered by USDA, Food and Nutrition Service, WIC provides Federal grants to States for supplemental foods, health care referrals, and nutrition education for low-income pregnant, breastfeeding, and non-breastfeeding postpartum women, and to infants and children up to age 5 who are found to be at nutritional risk.

Supplemental Nutrition Assistance Program (SNAP)	Administered by USDA, Food and Nutrition Service, SNAP offers nutrition assistance to millions of eligible, low-income individuals and families and provides economic benefits to communities. SNAP is the largest program in the domestic hunger safety net.
Socioeconomic status (SES)	A hierarchical measure of an individual's or household's economic and social position in society. Major determinants of SES are income, education, and occupation.
The Greatest Generation	A demographic cohort that is defined by the Pew Charitable Trust as being born before 1928.
Thrifty Food Plan (TFP)	Formulated by USDA, Center for Nutrition Policy and Promotion, TFP details a nutritious diet that can be achieved with limited money and time resources. TFP forms the basis for maximum Supplemental Nutrition Assistance Program (SNAP) allotments.
unemployment rate	The share of individuals who are not employed and/or are actively seeking employment.
unprepared ingredients	Foods that are basic ingredients to other foods or have little to no processing other than for preserving.