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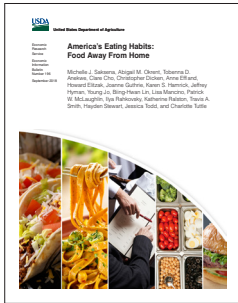
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# America's Eating Habits: Food Away From Home

By 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

Edited by Michelle J. Saksena, Abigail M. Okrent, and Karen S. Hamrick

## 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.

ERS is a primary source of economic research and analysis from the U.S. Department of Agriculture, providing timely information on economic and policy issues related to agriculture, food, the environment, and rural America.

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

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

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

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

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

## **How Was the Study Conducted?**

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

## Chapter 10: Menu Labeling

Hayden Stewart, Tobenna D. Anekwe, and Jeffrey Hyman

*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.<sup>80</sup> 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).

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<sup>80</sup>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.<sup>81</sup>

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

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<sup>81</sup>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).

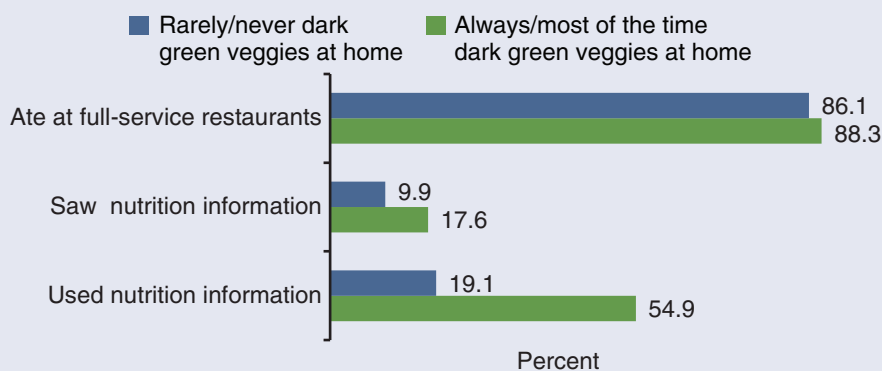


## Americans Who Have Dark Green Vegetables Available at Home Are More Likely To Use Nutrition Information at Full-Service Restaurants

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).<sup>82</sup> 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

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<sup>82</sup>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.<sup>83</sup> 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.

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<sup>83</sup>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 lunch-time 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<sup>84</sup>:

- 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

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<sup>84</sup>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<sup>85, 86</sup>) 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.<sup>87</sup> 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.

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<sup>85</sup>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.

<sup>86</sup>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.

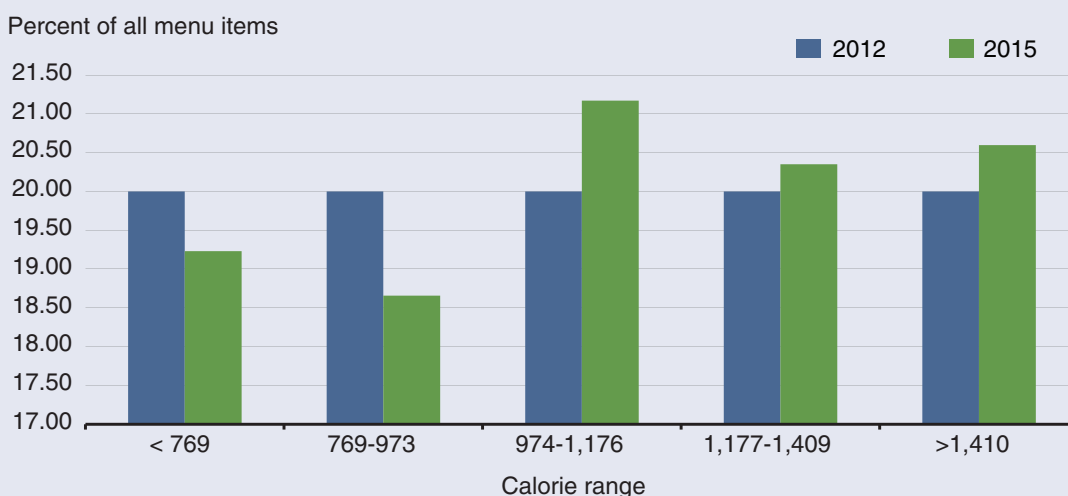
<sup>87</sup>The analysis included only side dishes that came with an entrée at no additional cost. Add-on items for which customers had to pay extra were excluded.

## 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.<sup>88</sup> 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.).

<sup>88</sup>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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