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Economic Research Service

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June 2014

Consumers' Use of Nutrition Information When Eating Out

Christian A. Gregory, Ilya Rahkovsky, and Tobenna D. Anekwe

United States Department of Agriculture

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Abstract

Until recently, many restaurants and fast-food places did not offer nutrition information at the point of purchase. This is expected to change because the 2010 Patient Protection and Affordable Care Act requires that nutrition information be posted in many of these venues. Once the law is fully implemented, it will be important to understand how it has affected consumer behavior. To establish a baseline against which to measure changes in the use of onsite nutrition information about food away from home (FAFH), we examine the demographic characteristics and dietary behaviors of U.S. consumers of FAFH before passage of the law, based on responses to the 2007-08 and 2009-10 National Health and Nutrition Examination Survey (NHANES). In particular, we examine the characteristics of consumers who use nutrition information and of those who express interest in using the information when they eat out in the future.

Keywords: Food away from home, diet quality, nutrition

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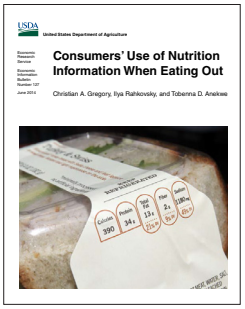
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What Is the Issue?

One strategy for helping Americans improve their diets is to make nutrition information more widely available. A practical problem for this strategy has been the recent increase in household reliance on food away from home (FAFH); this food has not, on the whole, been subject to the same nutrition-labeling requirements as food items sold to be prepared and eaten at home (FAH). In response to this problem, the 2010 Patient Protection and Affordable Care Act requires all restaurants with 20 or more locations to provide nutrition information on menus. The Food and Drug Administration is working to fully implement this provision of the law.

Given these upcoming changes, it would be helpful to know who already uses nutrition information that eating establishments provide voluntarily and who might use such information when it becomes widely available because of the new regulations. What are the demographic and diet-related characteristics of those who already use nutrition information when eating out and those who say they would use such information if it were available? Would more nutrition information in FAFH settings prompt the average consumer to make better choices?

What Did the Study Find?

Based on responses to the 2007-08 and 2009-10 National Health and Nutrition Examination Survey (NHANES), the authors find that the use of nutrition information at full-service restaurants (FSRs) and fast-food/pizza establishments (FFs) is strongly and positively correlated with certain dietary habits, diet quality, and demographic characteristics:

- Of consumers who eat out, those who eat out more frequently are less likely to use nutrition information at FAFH venues than those who eat out occasionally.

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.

- Use of nutrition information is correlated with other diet-related behaviors. For example, those who say they "always" or "most of the time" keep dark green vegetables at home are much more likely to use nutrition information at FSRs than those who say they "rarely" or "never" keep such vegetables at home.

- Those who rate their diets as poor are less likely to use nutrition information on the menu at FFs or FSRs than consumers who rate their diets as excellent or very good.

- Of the people who saw nutrition information during their last visit to a fast-food restaurant, women and Supplemental Nutrition Assistance Program (SNAP) participants are much more likely to have used that information than men or individuals not participating in SNAP.

In addition, we find a strong correlation between whether consumers say they *would* use nutrition information at FFs and FSRs if it were available and the quality of their diets. Consumers who intend to use the information when they eat out have higher scores in USDA's Healthy Eating Index and consume less sugar.

How Was the Study Conducted?

This analysis uses data from the 2007-08 and 2009-10 Flexible Consumer Behavior Survey module (FCBS) of the NHANES to examine the relationship between Americans' use of nutrition information and their demographic and health-related characteristics. The FCBS asks consumers about their food shopping and spending habits, self-perceived diet quality, familiarity with U.S. Department of Agriculture dietary guidance, and use of nutrition information. The FCBS followup survey by phone, which focuses on attitudes toward nutrition information in FAFH settings, is central to the analysis.

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Introduction

The health and economic burden of diet-related health conditions—in particular, conditions related to obesity—has prompted various policy proposals. One response has been to emphasize the need for monetary incentives to encourage healthy eating. This includes proposals for taxes (or subsidies) for foods thought to harm (or support) good health (Brownell et al., 2009; Cash et al., 2005; Chouinard, et al., 2007; Jacobson and Brownell, 2000; Rahkovsky and Gregory, 2013). Other ideas have included restrictions on advertising and promotions targeted to children, restrictions on foods and beverages sold in schools, and nutrition education funding (Seiders and Petty, 2004).

Providing more information about the nutritional quality of food, a prominent policy idea, has a pedigree dating at least to the National Labeling and Education Act (NLEA) of 1990, and there is some evidence that interventions such as the NLEA have been successful in improving Americans' diets (Drichoutis, et al., 2006; Kim, et al., 2001 and 2000; Variyam, 2008). However, because these labeling interventions applied only to food prepared at home (FAH), food away from home (FAFH) was left unaddressed. This has become a particularly important omission as the share of calories consumed from FAFH has increased in recent years.

The Patient Protection and Affordable Care Act (ACA) seeks to redress the relative lack of FAFH nutrition information by requiring restaurants and similar retail food establishments with 20 or more locations to post on the menu the number of calories contained in each item. According to the law, menus must also compare calorie content to suggested total daily caloric intake. Other nutrient information—fat, saturated fat, cholesterol, sodium, total carbohydrates, sugars, fiber, and total protein—would have to be made available in writing upon request. The Act also requires vending machine operators who own or operate 20 or more vending machines to post the calorie content for items being sold (The Patient Protection and Affordable Care Act, 2010; U.S. Food and Drug Administration, 2012a). In order to guide implementation of these ACA requirements, the Food and Drug Administration (FDA) has issued proposed rules. For example, the FDA proposes that consumers be informed of the suggested daily caloric intake with the following language: "A 2,000 calorie diet is used as the basis for general nutrition advice; however, individual calorie needs may vary" (U.S. Food and Drug Administration, 2012b).

Prior to these nationwide efforts, a number of States, counties, and municipalities had already passed or implemented menu-labeling policies designed to provide consumers with FAFH nutrition information at the point of purchase. In 2008, New York City implemented regulations requiring food-service establishments that are part of a chain of 15 or more restaurants nationally to post calories on menus. That same year, King County, Washington, implemented labeling regulations, requiring

chain restaurants with 15 or more national locations and at least $1 million in annual chain-wide sales to display calorie, saturated fat, sodium, and carbohydrate information at the point of purchase (Center for Science in the Public Interest, 2009). Indeed, by April 2011, menu-labeling policies had been implemented in two States and nine counties and cities and had been passed (but not yet implemented) in an additional four States and two counties. (This count does not include four counties and the city of San Francisco, all of which had implemented policies that were superseded by a State menu-labeling law (Center for Science in the Public Interest, 2011).) A 2004 survey of 287 large restaurant chains revealed that 54 percent of the chains were providing at least some nutrition information on their websites or by other means (Wootan and Osborn, 2006).

With these changes to the food-labeling environment, it would be helpful to know at the national level who uses this nutrition information and how. Previous studies have shown that just half of consumers are likely to use such information (Krukowski et al., 2006). In particular, it would be helpful to know if consumers who already have good diets at home would use FAFH nutrition information more than other consumers or whether a wider range of consumers would use the information to make better choices. Economic theory suggests that people who use an input most heavily benefit the most when the price of that input drops; thus, Government policies that reduce the price of health inputs can increase health disparities (Goldman and Lakdawalla, 2001). A nutrition-labeling policy would reduce the "price" (i.e., time cost) of nutrition information for consumers (as consumers would not have to spend time looking for it) and could therefore be most beneficial to heavy users of that information who are, on average, more educated and have better diets and healthier weights (Variyam, 2005). This report examines whether this dynamic might be true—that is, whether people's health and diet quality are positively correlated with use of FAFH nutrition information.

Data

The data for this report come from the 2007-08 and 2009-10 waves of the National Health and Nutrition Examination Survey (NHANES), a stratified, multistage probability sample of the civilian, noninstitutionalized U.S. population. The survey oversamples Blacks, Hispanics, people over age 60, and low-income people. NHANES consists of a series of initial interviews, usually conducted at the participants' homes, and a subsequent health examination completed at a Mobile Examination Center, which is a mobile clinic for health assessment.[1] All data were collected before implementation of the ACA, so the survey can be viewed as baseline data to help understand changes related to the implementation of the law.

We focus on data from the phone followup component of the Flexible Consumer Behavior Survey module (FCBS) of NHANES. The FCBS was developed by the National Center for Health Statistics in collaboration with researchers at the Economic Research Service (ERS), and it contains information on respondents' food shopping and spending habits, along with the frequency with which they eat food away from home, eat fast food, and cook meals at home, among other behaviors. Most important for this report, the phone followup survey asks a series of questions about respondents' use of nutrition information when they eat away from home—at either fast-food/pizza places or full-service restaurants. In particular, respondents are asked:

- 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 to help make their selections; and
- If they have eaten food away from home (FAFH) in the previous 12 months, whether they would use nutrition information on FAFH menus in the future.

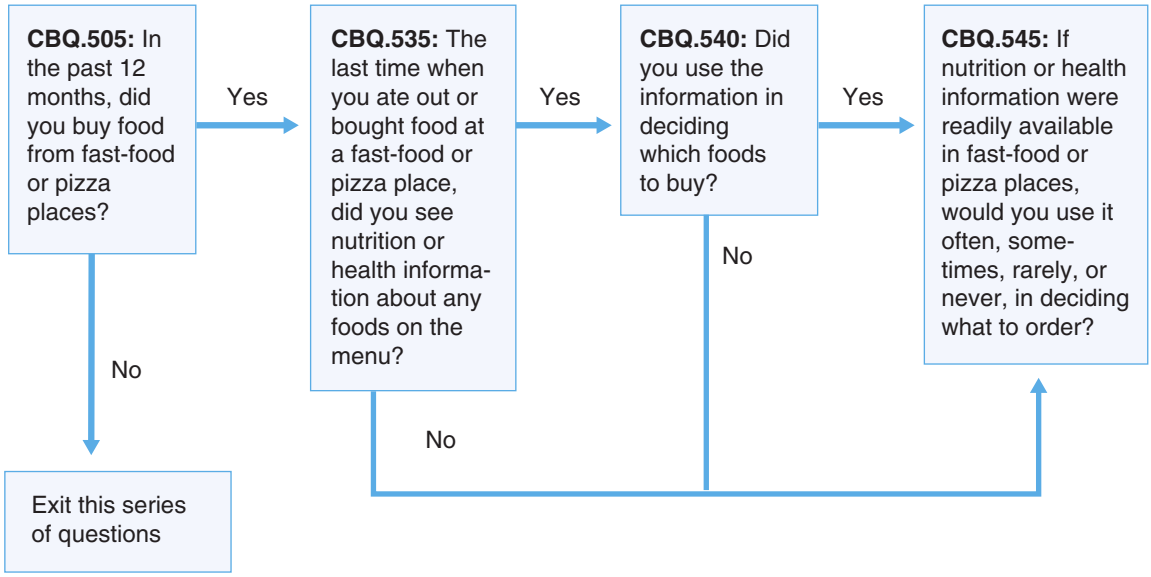
These questions and the associated skip pattern are shown for FFs and FSRs in figures 1a and 1b, respectively.[2] We use the adult FCBS sample, which includes only those who are at least 20 years old who have completed the NHANES dietary recall module. The weighted sample is 54 percent female, 71 percent non-Hispanic White, 11 percent non-Hispanic Black, 13 percent Hispanic, and 5 percent from other racial/ethnic backgrounds.

[1]We used the survey design information (primary sampling units and sample weights) included in NHANES to compute nationally representative estimates.

[2]For a few of the variables that we use to stratify the study sample—e.g., whether the household stores certain kinds of foods—we use only the 2007-08 wave because the relevant questions were not asked in 2009-10.

Figure 1a

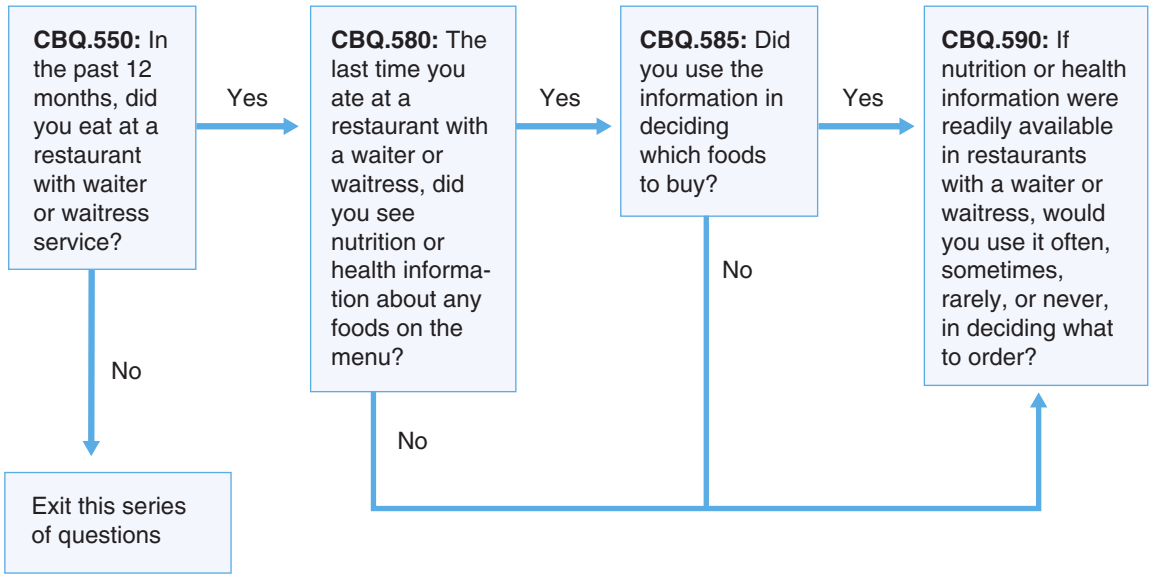
Skip-pattern in the nutrition-information questions for fast-food and pizza places, NHANES 2007-2010 Flexible Consumer Behavior Survey (FCBS) phone followup



NHANES = National Health and Nutrition Examination Survey. CBQ = Consumer Behavior Question.

Figure 1b

Skip-pattern in the nutrition-information questions for full-service restaurants, NHANES 2007-2010 Flexible Consumer Behavior Survey (FCBS) phone followup



NHANES = National Health and Nutrition Examination Survey. CBQ = Consumer Behavior Question.

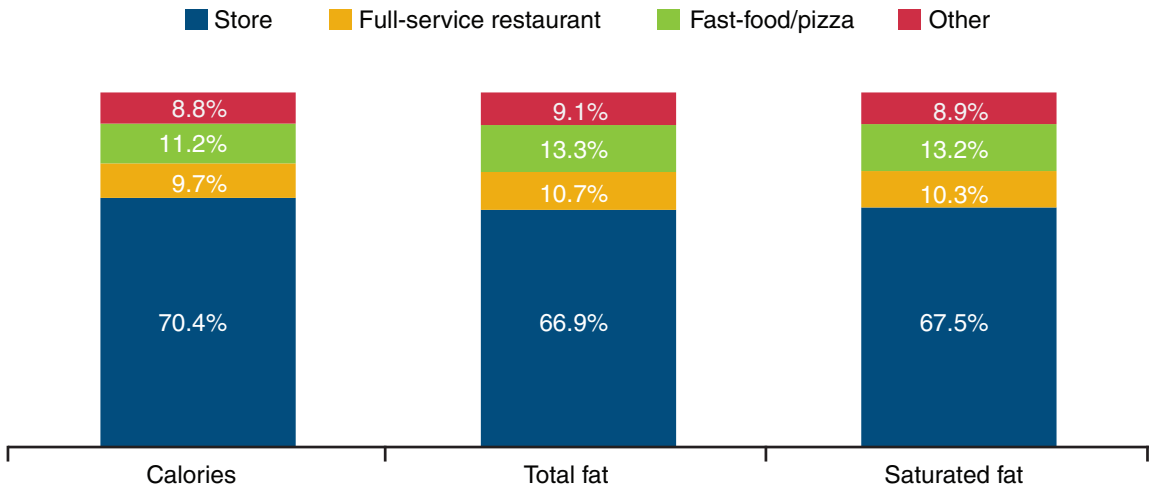
Diet Quality Relationship to Food Source: Home or Away From Home

U.S. consumers have been decreasing their consumption of food bought from a store and prepared at home over the last 20 years while increasing consumption of food bought and consumed away from home. Research has shown that food eaten away from home is often of lower nutritional quality (Todd, et al., 2010).

Figure 2 uses our data to demonstrate this. It shows the proportion of calories, total dietary fat, and saturated fat that Americans get from four sources: stores, fast-food/pizza establishments (FFs), full-service restaurants (FSRs), and other establishments.[3] If diet choices away from home were similar to those made at home, we would expect the proportions in each column to be the same. For example, we see that Americans get about 70 percent of their calories from store-bought foods, 11 percent from FFs, and 10 percent from FSRs[4]; if the foods chosen from each source were similar, we would expect to see a similar breakdown for fat and saturated fat. However, Americans get a higher proportion of total fat and saturated fat from FFs than from store-bought foods (fig. 2).[5] These

Figure 2

On average, Americans get a higher fraction of their daily fats than calories from food at fast-food/pizza places



Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

[3]For the purposes of our typology, "other" food sources in NHANES include school cafeterias, cafeterias not at school, childcare centers, family/adult daycare centers, soup kitchens/shelters/food pantries, Meals on Wheels, community food programs, vending machines, shared coffeemakers (e.g., in offices or churches), snack trays, gifts, mail orders, residential dining facilities, street trucks, sports facilities, and fundraiser sales. It also includes food that has been grown or caught by the respondent or someone they know.

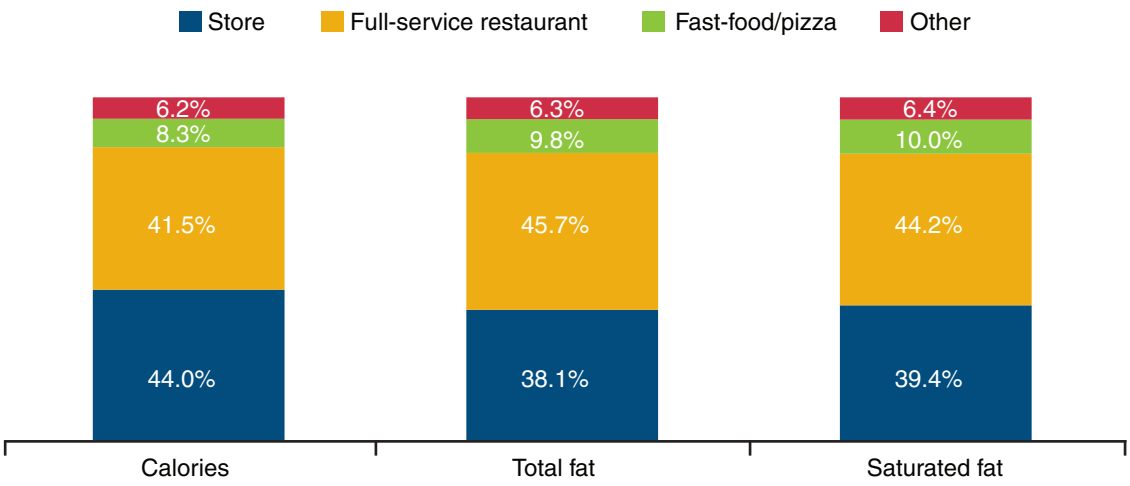
[4]Our estimate of the share of calories from FAFH can be compared with recent ERS research. Specifically, we find that 9.7 percent of calories come from FSRs (compared with 7 percent in a study by Lin and Guthrie, 2012) and 11.2 percent come from FFs (compared with 13 percent in Lin and Guthrie). These differences may be explained by differences in methodology. For example, Lin and Guthrie used 2005-08 waves of NHANES (compared with our 2007-10 waves), and Lin and Guthrie examined Americans aged 2 years and older, whereas our sample examines Americans aged 20 years and older.

[5]Unless otherwise noted, differences discussed in the text are significant by at least $p < 0.05$.

differences between food at home and away from home are even more pronounced if we examine only those who get at least some of their calories from FFs or FSRs. Figure 3 shows the distribution of nutrients for those who have at least some intake from FSRs, while figure 4 shows the distribution for those who get at least some intake from FFs. People who have some intake from FSRs get about 46 percent of their fats from restaurants but just 42 percent of their calories from restaurants (fig. 3).

Figure 3

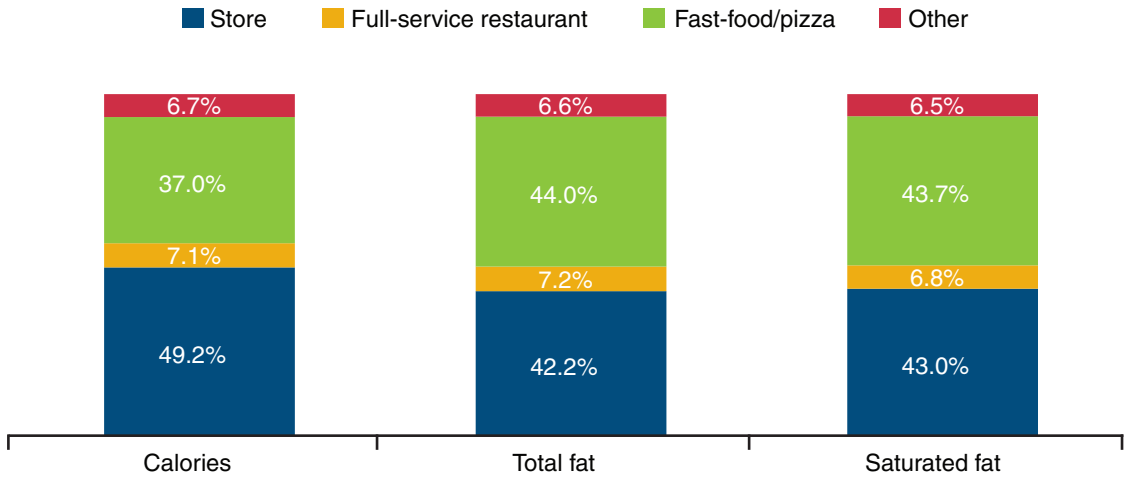
Americans who eat at full-service restaurants get a higher proportion of fats than calories from those establishments



Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

Figure 4

Americans who eat at fast-food/pizza places get a higher proportion of fats than calories from those establishments



Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

Those who eat food from FFs get 44 percent of their total fats there, compared with just 37 percent of their calories. These differences are larger than those in figure 2, and the proportions of calories stand in stark contrast to the proportion of calories for the population as a whole shown in figure 2.

These FAH vs. FAFH dietary differences can have several explanations. One is that FAFH is formulated with higher amounts of total fat and saturated fat than the foods typically prepared at home. For example, it is plausible that restaurants find themselves able to sell foods of lower diet quality, on average, than home-cooked foods because patrons desire the other attributes of restaurant meals when they eat out, such as taste and convenience (Stewart, et al., 2006). Also, when people dine away from home, they are likely choosing meals, desserts, and beverages with higher fat content than what they consume at home, even if healthier foods are on the menu.

There is evidence that consumers do care about the healthfulness of their diets but that they also weigh other considerations such as taste, convenience, and amenities when deciding whether to eat FAFH (Stewart et al., 2006). For example, full-service restaurants have wait staff, may serve alcohol, and generally have pleasant décor—attributes that attract consumers looking for a quality experience and amenities (Davis & Stewart, 2002). Finally, since the passage of the Nutritional Labeling and Education Act (1990), almost all products sold for in-home consumption contain nutrition information; however, because few restaurants voluntarily post this information on their menus, consumers may find it difficult to make healthy choices while eating out. The lack of disclosure at the point of purchase might be a cause of the lower nutritional quality of FAFH. Further, in order to eat out healthfully, consumers need to be offered meals that fall within recommended limits for sodium, fat, and saturated fat, which some food establishments may not always provide (Wu & Sturm, 2013).

Nutrition Information Use for Food Away From Home

Almost all respondents in our NHANES sample report going to both a FF and a FSR in the previous 12 months—roughly 90 percent went to FFs and 88 percent to FSRs (tables 1 and 5).[6] But few of these respondents saw nutrition information. Of those who patronized FFs, roughly 21 percent saw nutrition information on menus, while 17 percent of FSR patrons did. And of those who saw nutrition information on the menus at FFs and FSRs, 42 and 55 percent, respectively, say they used this information. Because few consumers saw nutrition information while eating out, the total share of FF and FSR patrons who used nutrition information was about 10 percent.

Nutrition Information Use in Fast-Food/Pizza Places (FFs)

Use by Gender, Ethnicity, and SNAP Participation

In addition to the findings discussed for the general population, there are also interesting differences across population subgroups. For example, men and women are about equally likely to go to fast-food restaurants and to see nutrition information on the menu (fig. 5). However, men are much less likely to use nutrition information in FFs than women: 33.1 percent of men who saw nutrition information on the menu at a FF used it, while 48.7 percent of women used it. This finding echoes prior empirical studies and review articles that have found that women are more likely than men to use nutrition labels (Campos, et al., 2011; Drichoutis et al., 2006). This gender difference may be

[6]In all of the tables, column-wise differences are indicated by superscript letters. Any pair of means with the same letter superscript is different at $p < 0.05$.

Table 1

Proportion of Americans who go to fast-food/pizza places (Go), see nutrition information on the menu there (See), use nutrition information there having seen it (Use), and would use nutrition information there (Would Use)

	Go	See	Use	Would Use
Full sample	0.904	0.217	0.416	0.612
	(0.004)	(0.008)	(0.013)	(0.008)
N	9,018	7,706	1,504	9,018
Male	0.913[v]	0.211	0.331[v]	0.549[v]
	(0.005)	(0.010)	(0.023)	(0.010)
N	4,193	3,616	676	4,193
Female	0.896[v]	0.223	0.487[v]	0.667[v]
	(0.005)	(0.010)	(0.020)	(0.011)
N	4,825	4,090	828	4,825
Hispanic	0.846[v]	0.158[vw]	0.516[v]	0.551[vw]
	(0.011)	(0.009)	(0.030)	(0.017)
N	2,481	2,019	310	2,481
Non-Hispanic White	0.921[vw]	0.230[vx]	0.393[vw]	0.627[v]
	(0.005)	(0.009)	(0.018)	(0.012)
N	4,451	3,918	842	4,451
Non-Hispanic Black	0.872[w]	0.223[wy]	0.479[w]	0.603[w]
	(0.012)	(0.012)	(0.031)	(0.018)
N	1,740	1,466	300	1,740
Non-Hispanic Other	0.885	0.159[xy]	0.470	0.577
	(0.024)	(0.027)	(0.079)	(0.029)
N	346	303	52	346
High school dropout	0.802[vwx]	0.151[vw]	0.475[v]	0.488[vwx]
	(0.011)	(0.016)	(0.038)	(0.013)
N	2,442	1,819	253	2,442
High school graduate	0.908[vyz]	0.171[xy]	0.395	0.609[vy]
	(0.007)	(0.014)	(0.033)	(0.013)
N	2,146	1,876	307	2,146
Some college	0.934[wy]	0.249[vx]	0.383[v]	0.639[w]
	(0.006)	(0.014)	(0.027)	(0.014)
N	2,534	2,303	531	2,534
College graduate	0.933[xz]	0.257[wy]	0.444	0.666[xy]
	(0.008)	(0.013)	(0.029)	(0.014)
N	1,896	1,708	413	1,896
Poor (below 130% of Federal Poverty Level –(FPL))	0.844[vw]	0.192[v]	0.447	0.531[vw]
	(0.010)	(0.012)	(0.035)	(0.015)
N	2,572	2,073	353	2,572
Low income (130%-250% of FPL)	0.880[vx]	0.195	0.442	0.609[v]
	(0.011)	(0.014)	(0.040)	(0.012)

—continued

Table 1

Proportion of Americans who go to fast-food/pizza places (Go), see nutrition information on the menu there (See), use nutrition information there having seen it (Use), and would use nutrition information there (Would Use)—continued

	Go	See	Use	Would Use
N	2,096	1,773	303	2,096
High income (>250% FPL)	0.931[wx]	0.232[v]	0.402	0.639[v]
	(0.004)	(0.009)	(0.017)	(0.012)
N	4,350	3,860	848	4,350
SNAP participant	0.848v	0.194	0.517[v]	0.563[v]
	(0.018)	(0.020)	(0.052)	(0.025)
N	963	789	144	963
SNAP nonparticipant and low income	0.840[w]	0.190[v]	0.391	0.509[w]
	(0.010)	(0.013)	(0.040)	(0.017)
N	1,596	1,274	206	1,596
High income	0.918[vw]	0.223[v]	0.411[v]	0.632[vw]
	(0.004)	(0.009)	(0.015)	(0.010)
N	6,446	5,633	1,151	6,446
WIC	0.927[v]	0.167	0.276	0.649
	(0.025)	(0.049)	(0.119)	(0.059)
N	120	110	17	120
Eligible WIC nonparticipant	0.845[vw]	0.197	0.444	0.545[v]
	(0.007)	(0.010)	(0.022)	(0.010)
N	3,619	2,929	508	3,619
Not WIC-eligible	0.927[w]	0.226	0.409	0.639[v]
	(0.005)	(0.009)	(0.017)	(0.011)
N	5,279	4,667	979	5,279
Normal weight	0.890[v]	0.216	0.438	0.600
	(0.007)	(0.014)	(0.035)	(0.011)
N	2,431	2,052	383	2,431
Overweight	0.905	0.212	0.445[v]	0.606
	(0.006)	(0.013)	(0.028)	(0.013)
N	3,075	2,154	399	2,436
Obese	0.914[v]	0.224	0.375[v]	0.628
	(0.007)	(0.009)	(0.023)	(0.012)
N	3,512	3,051	624	3,512

SNAP = Supplemental Nutrition Assistance Program; WIC = Special Supplemental Nutrition Program for Women, Infants, and Children.

v,w,x,y,z: For each survey question (each column) and each panel (e.g., gender, race, poverty status), groups with the same letter superscript have mean values that are significantly different ($p < 0.05$).

Source: USDA, Economic Research Service calculations using NHANES 2007-10 data. Survey design accounted for; observations weighted using day 1 dietary survey weight (WTDRD1). Standard errors are in parentheses.

Table 2

Healthy Eating Index (HEI), sugar, and saturated fat intake of Americans who go to fast-food/pizza places, see nutrition information there, use nutrition information there, and who would use nutrition information there

	HEI	Sugar (g)	Saturated fat (g)
Go	54.91[t]	97.83[t]	122.22[t]
	(0.59)	(2.61)	(2.38)
N	1,258	1,258	1,258
Did not go	50.05[t]	119.23[t]	113.97[t]
	(0.43)	(1.48)	(1.14)
N	7,760	7,760	7,760
See	49.80	119.78	27.23
	(0.46)	(1.89)	(0.38)
N	6,201	6,201	6,201
Did not see	50.93	117.03	26.66
	(0.52)	(2.31)	(0.49)
N	1,505	1,505	1,505
Use	48.44[t]	125.99[t]	28.87[t]
	(0.63)	(3.31)	(0.68)
N	823	823	823
Did not use	54.36[t]	104.36[t]	23.63[t]
	(0.69)	(2.56)	(0.72)
N	681	681	681
Would use	49.64	122.22[t]	27.08[t]
	(0.39)	(2.38)	(0.46)
N	3,845	3,845	3,845
Would not use	51.07	113.97[t]	26.01[t]
	(0.52)	(1.14)	(0.32)
N	5,173	5,173	5,173

[t]For each survey question (each panel) and each column (e.g., HEI), groups with the same letter superscript have mean values that are significantly different ($p < 0.05$).

Source: USDA, Economic Research Service calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1). Standard errors are in parentheses.

Table 3

Self-assessed diet quality of Americans who go to fast-food/pizza places (Go), see nutrition information on the menu there (See), use nutrition information having seen it (Use), and would use the information in the future (Would Use)

	Go	See	Use	Would Use
Self-reported diet health excellent	0.813[tuvw]	0.284[t]	0.534[tuv]	0.574
	(0.017)	(0.038)	(0.071)	(0.030)
N	789	589	136	789
Self-reported diet health very good	0.886[txyz]	0.239[u]	0.490[wxy]	0.644[tu]
	(0.007)	(0.012)	(0.032)	(0.016)
N	1,942	1,629	359	1,942
Self-reported diet health good	0.920[ux]	0.216[v]	0.378[tw]	0.632[vw]
	(0.005)	(0.012)	(0.024)	(0.011)
N	3,684	3,211	655	3,684
Self-reported diet health fair	0.926[vy]	0.175[tuv]	0.355[ux]	0.574[tv]
	(0.007)	(0.012)	(0.042)	(0.015)
N	2,139	1,869	292	2,139
Self-reported diet health poor	0.921[wz]	0.203	0.308[vy]	0.524[uw]
	(0.014)	(0.034)	(0.065)	(0.025)
N	461	406	62	461

t,u,v,w,x,y,z: For each survey question (each column), groups with the same letter superscript have mean values that are significantly different ($p < 0.05$).

Source: USDA, Economic Research Service calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1). Standard errors are in parentheses.

Table 4

Proportion with specified diet behaviors among Americans who go to fast-food/pizza places (Go), see nutrition information there (See), use nutrition information there having seen it (Use), and would use nutrition information there (Would Use)

	Go	See	Use	Would Use
<2 fast-food meals/wk	0.920[xy]	0.222	0.443[x]	0.642[x]
	(0.004)	(0.010)	(0.017)	(0.009)
N	5,239	4,646	937	5,239
2-5 fast-food meals/wk	0.978[x]	0.242	0.348[x]	0.644
	(0.003)	(0.017)	(0.040)	(0.019)
N	1,247	1,193	260	1,247
>5 fast-food meals/wk	0.983[y]	0.204	0.313	0.584[x]
	(0.006)	(0.032)	(0.078)	(0.027)
N	508	491	94	508
<2 FAFH meals/wk	0.811[xy]	0.191	0.499[xy]	0.544[xy]
	(0.008)	(0.013)	(0.037)	(0.014)

—continued

Table 4

Proportion with specified diet behaviors among Americans who go to fast-food/pizza places (Go), see nutrition information there (See), use nutrition information there having seen it (Use), and would use nutrition information there (Would Use)—continued

	Go	See	Use	Would Use
N	3,547	2,655	444	3,547
2-5 FAFH meals/wk	0.943[xz]	0.223	0.409[x]	0.646[x]
	(0.004)	(0.009)	(0.018)	(0.012)
N	3,893	3,567	742	3,893
>5 FAFH meals/wk	0.961[yz]	0.239	0.346[y]	0.642[y]
	(0.007)	(0.020)	(0.043)	(0.016)
N	1,578	1,484	318	1,578
Always/most of time have salty snacks available at home	0.931[xy]	0.210	0.367	0.642[x]
	(0.005)	(0.008)	(0.027)	(0.013)
N	2,516	2,232	425	2,516
Sometimes have salty snacks available at home	0.887[xz]	0.183	0.447	0.588
	(0.013)	(0.021)	(0.058)	(0.026)
N	1,053	889	143	1,053
Rarely/never have salty snacks available at home	0.814[yz]	0.194	0.447	0.520[x]
	(0.018)	(0.038)	(0.062)	(0.034)
N	721	543	82	721
Always/most of time have dark green veg. available at home	0.902	0.195[x]	0.415	0.622[x]
	(0.006)	(0.009)	(0.026)	(0.014)
N	3,364	2,866	512	3,364
Sometimes have dark green veg. available at home	0.918	0.243[x]	0.326	0.645[y]
	(0.015)	(0.020)	(0.073)	(0.022)
N	602	523	88	602
Rarely/never have dark green veg. available at home	0.912	0.188	0.324	0.475[xy]
	(0.025)	(0.046)	(0.064)	(0.046)
N	323	275	50	323
Always/most of time have fruit available at home	0.903	0.201	0.410	0.623[x]
	(0.006)	(0.006)	(0.016)	(0.015)
N	3,718	3,183	575	3,718
Sometimes have fruit available at home	0.916	0.231	0.280	0.560[x]
	(0.010)	(0.043)	(0.093)	(0.024)
N	430	362	58	430

—continued

Table 4

Proportion with specified diet behaviors among Americans who go to fast-food/pizza places (Go), see nutrition information there (See), use nutrition information there having seen it (Use), and would use nutrition information there (Would Use)—continued

	Go	See	Use	Would Use
Rarely/never have fruit available at home	0.923	0.140	0.259	0.499
	(0.026)	(0.047)	(0.117)	(0.064)
N	142	119	17	142
Always/most of the time use Nutrition Facts Panel	0.903^{xy}	0.201^{xy}	0.410^{xy}	0.623^{xy}
	(0.006)	(0.006)	(0.016)	(0.015)
N	3,718	3,183	575	3,718
Sometimes use Nutrition Facts Panel	0.916^{x}	0.231^{x}	0.280^{xz}	0.560^{xz}
	(0.010)	(0.043)	(0.093)	(0.024)
N	430	362	58	430
Rarely/never use Nutrition Facts Panel	0.923^{y}	0.140^{y}	0.259^{yz}	0.499^{yz}
	(0.026)	(0.047)	(0.117)	(0.064)
N	142	119	17	142

x,y,z: For each survey question (each column) and each panel (e.g., FAFH frequency, use Nutrition Facts Panel), groups with the same letter superscript have mean values that are significantly different ($p < 0.05$).

FAFH = Food away from home.

Source: USDA, Economic Research Service calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1). Standard errors are in parentheses.

Table 5

Proportion of Americans who go to full-service restaurants (Go), who see nutrition information on the menu there (See), who use nutrition information having seen it (Use), and who would use nutrition information there (Would Use)

	Go	See	Use	Would Use
Full sample	0.884	0.168	0.553	0.607
	(0.006)	(0.008)	(0.018)	(0.009)
N	9,015	7,430	1,152	9,015
Male	0.894	0.137^{u}	0.481^{u}	0.529^{u}
	(0.007)	(0.009)	(0.029)	(0.012)
N	4,192	3,508	443	4,192
Female	0.875	0.195^{u}	0.596^{u}	0.674^{u}
	(0.006)	(0.012)	(0.028)	(0.010)
N	4,823	3,922	709	4,823
Hispanic	0.769^{uv}	0.123^{uv}	0.730^{uv}	0.521^{u}
	(0.015)	(0.012)	(0.038)	(0.017)
N	2,482	1,877	215	2,482
Non-Hispanic White	0.925^{uwx}	0.169^{uw}	0.527^{u}	0.639^{uv}
	(0.009)	(0.010)	(0.021)	(0.012)
N	4,448	3,963	614	4,448

—continued

Table 5

Proportion of Americans who go to full-service restaurants (Go), who see nutrition information on the menu there (See), who use nutrition information having seen it (Use), and who would use nutrition information there (Would Use)—continued

	Go	See	Use	Would Use
Non-Hispanic Black	0.755[wy]	0.224[vwx]	0.574[v]	0.518[v]
	(0.016)	(0.015)	(0.034)	(0.018)
N	1,740	1,299	278	1,740
Non-Hispanic Other	0.883[vxy]	0.147[x]	0.605	0.580
	(0.019)	(0.023)	(0.108)	(0.035)
N	345	291	45	345
High school dropout	0.713[uvw]	0.134[u]	0.603	0.468[uvw]
	(0.017)	(0.014)	(0.049)	(0.015)
N	2,437	1,638	197	2,437
High school graduate	0.865[uxy]	0.169	0.502[u]	0.577[ux]
	(0.013)	(0.012)	(0.036)	(0.015)
N	2,147	1,752	278	2,147
Some college	0.913[vxz]	0.182[u]	0.514[v]	0.616[vy]
	(0.007)	(0.014)	(0.028)	(0.013)
N	2,536	2,232	376	2,536
College graduate	0.977[wyz]	0.169	0.615[uv]	0.712[wxy]
	(0.002)	(0.014)	(0.037)	(0.014)
N	1,895	1,808	301	1,895
Poor (Below 130% Federal poverty line)	0.720[uv]	0.160	0.514	0.465[uv]
	(0.012)	(0.013)	(0.049)	(0.015)
N	2,571	1,792	251	2,571
Low-income (130-250% FPL)	0.858[uw]	0.158	0.609	0.574[uw]
	(0.011)	(0.017)	(0.040)	(0.016)
N	2,096	1,683	255	2,096
High-income (>250% FPL)	0.944[vw]	0.173	0.546	0.664[vw]
	(0.005)	(0.009)	(0.019)	(0.011)
N	4,348	3,955	646	4,348
SNAP participant	0.643[uv]	0.178	0.565	0.424[uv]
	(0.015)	(0.021)	(0.074)	(0.023)
N	962	619	96	962
SNAP nonparticipant and low-income	0.771[uw]	0.151	0.476	0.493[uw]
	(0.015)	(0.014)	(0.057)	(0.020)
N	1,596	1,165	154	1,596
High-income	0.923[vw]	0.169	0.559	0.641[vw]

—continued

Table 5
Proportion of Americans who go to full-service restaurants (Go), who see nutrition information on the menu there (See), who use nutrition information having seen it (Use), and who would use nutrition information there (Would Use)—continued

	Go	See	Use	Would Use
	(0.005)	(0.010)	(0.019)	(0.010)
N	6,444	5,638	901	6,444
WIC	0.771[u]	0.192	0.659	0.568
	(0.041)	(0.070)	(0.200)	(0.047)
N	120	89	11	120
WIC-Eligible nonparticipant	0.756[v]	0.167	0.534	0.489[u]
	(0.009)	(0.011)	(0.033)	(0.014)
N	3,618	2,593	384	3,618
Not WIC-eligible	0.938[uv]	0.168	0.557	0.656[u]
	(0.004)	(0.009)	(0.019)	(0.011)
N	5,277	4,748	757	5,277
Normal weight	0.883	0.180[u]	0.593	0.628
	(0.009)	(0.012)	(0.038)	(0.013)
N	2,431	1,998	337	2,431
Overweight	0.893	0.141[uv]	0.496	0.598
	(0.007)	(0.010)	(0.034)	(0.012)
N	3,072	2,547	340	3,072
Obese	0.876	0.183[v]	0.560	0.599
	(0.008)	(0.012)	(0.030)	(0.013)
N	3,512	2,885	475	3,512

SNAP = Supplemental Nutrition Assistance Program; WIC = Special Supplemental Nutrition Program for Women, Infants, and Children.

u,v,w,x,y,z: For each survey question (each column) and each panel (e.g., gender, race), groups with the same letter superscript have mean values that are significantly different ($p < 0.05$).

Source: USDA, Economic Research Service calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1). Standard errors are in parentheses.

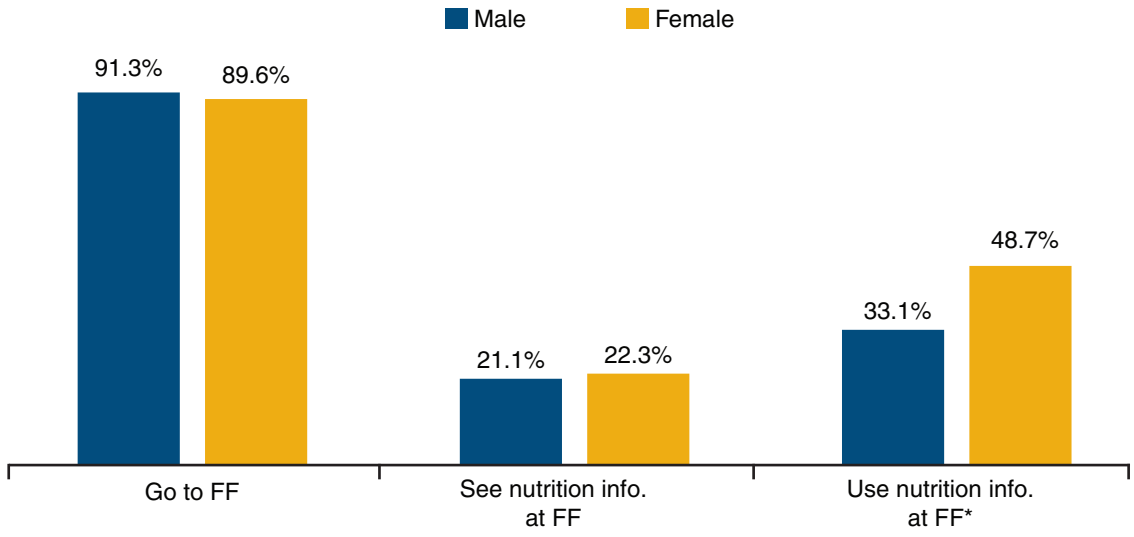
because, as Nayga (1999) shows, men are less likely than women to say that nutrition information is useful to them, less likely to say that reading food labels makes it easier to choose foods, and less likely to say that they read food labels because good health is important to them.

Hispanics are less likely than Whites to go to FFs and less likely than Whites or Blacks to see nutrition information on FF menus (fig. 6).[7] However, Hispanics are much more likely than Whites to use the information when they do see it—but because the share of Hispanics who go to FFs is lower than for Whites, the overall percentage of those who use nutrition information is similar for Hispanic FF patrons (8.2 percent) and White FF patrons (9.1 percent).

[7]Hispanics can be of any race. They are compared with non-Hispanic Whites and non-Hispanic Blacks.

Figure 5

Fast-food/pizza (FF) nutrition information and gender

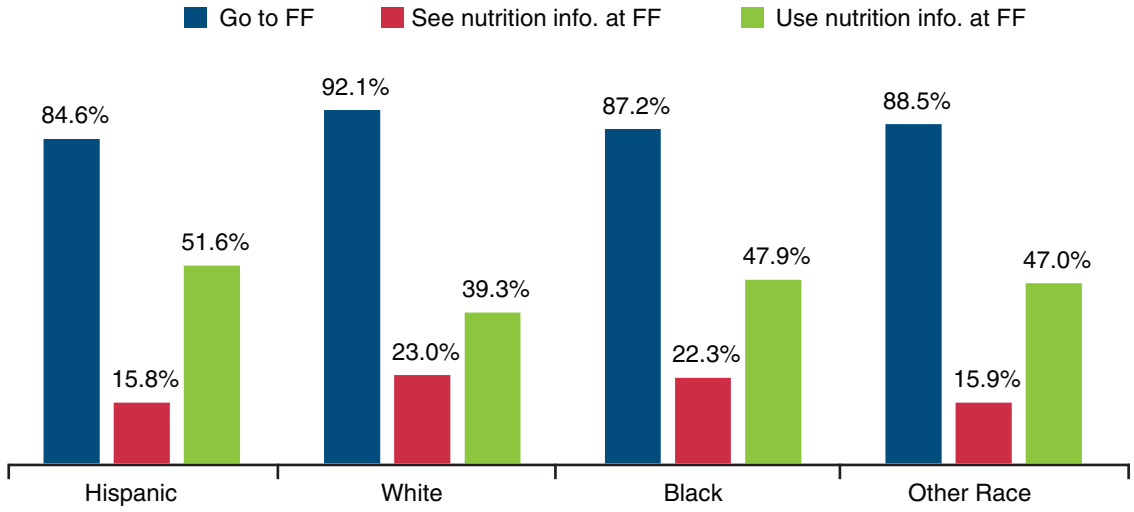


*Only respondents who answered affirmatively to the question about whether they went to fast-food/pizza places were asked whether they saw nutrition information. Only those who answered affirmatively to the question about whether they saw nutrition information were asked whether they used menu nutrition information.

Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

Figure 6

Fast-food/pizza (FF) nutrition information and race/ethnicity



*Only respondents who answered affirmatively to the question about whether they went to fast-food/pizza places were asked whether they saw nutrition information. Only those who answered affirmatively to the question about whether they saw nutrition information were asked whether they used menu nutrition information.

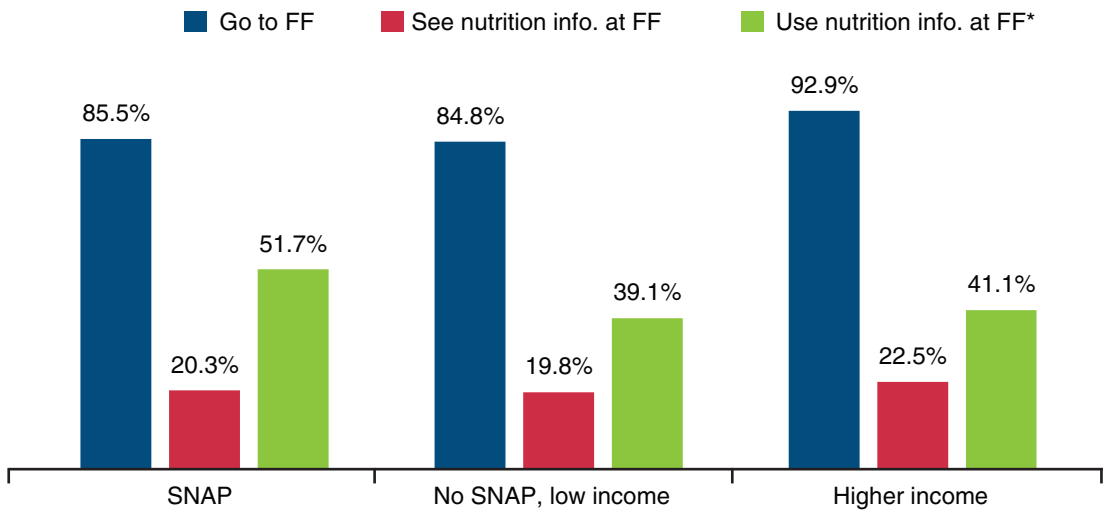
Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

Finally, SNAP participants and low-income nonparticipants go to FFs with less frequency than higher income people (fig. 7).[8] The share of SNAP participants and low-income nonparticipants who say that they ate at FFs during the previous 12 months is about 84 percent, compared with about 92 percent of higher income people. All three groups are about equally likely to notice nutrition information on FF menus (fig. 7). However, SNAP participants are much more likely to use the information when they see it than are higher income people (52 versus 41 percent) or low-income nonparticipants (39 percent).

Nutrition Information Users/Nonusers in FFs: Relation to Diet Quality and Food Patterns

A primary question about policies designed to reduce the time cost of acquiring nutrition information is whether such policies disproportionately benefit those who already have better diets. The dataset we use allows us to examine this question by looking at a wide array of indicators and behaviors that are correlated with a good diet and see if they are closely related to the use of nutrition information in FFs. We found that the use of nutrition information on FF menus is consistently and strongly related to better dietary health (table 2). However, the relationship between use of nutrition information and better diet quality may not be causal, as both may stem from a third factor such as general health consciousness.

Figure 7
Fast-food/pizza (FF) nutrition information and SNAP participation



*Only respondents who answered affirmatively to the question about whether they went to fast-food/pizza places were asked whether they saw nutrition information. Only those who answered affirmatively to the question about whether they saw nutrition information were asked whether they used menu nutrition information. SNAP = Supplemental Nutrition Assistance Program.

Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

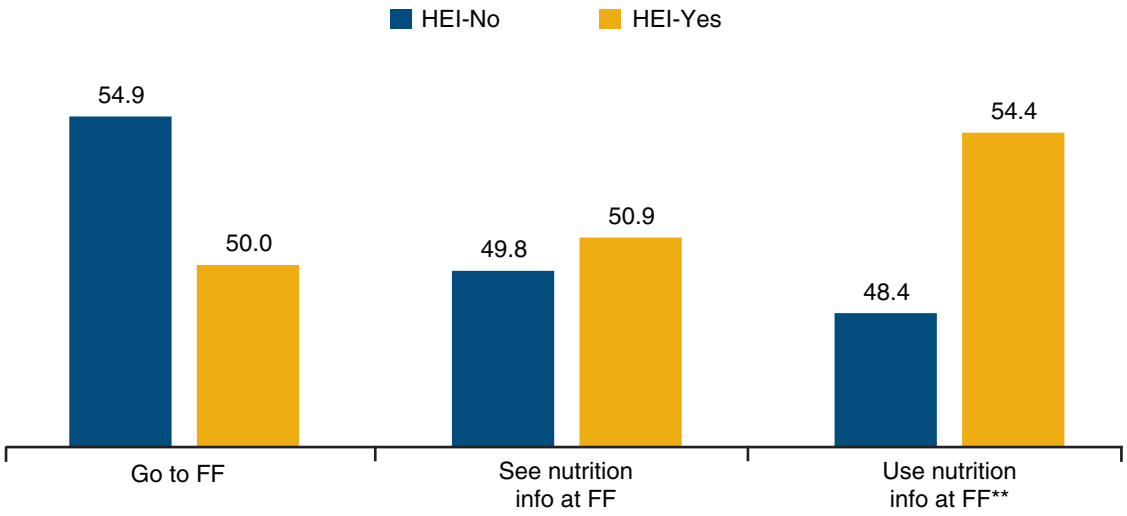
[8]We count persons in households with income less than 130 percent of the Federal poverty line as low income for this comparison. This is the household income cutoff for eligibility for SNAP. However, in recent years, many States have relaxed their eligibility rules so that families with incomes up to 200 percent of the Federal poverty line can participate in SNAP. Our findings did not change when we used 200 percent of the Federal poverty line as the cutoff instead of 130 percent.

We examined respondents' Healthy Eating Index (HEI) scores, stratified by whether respondents said that they went to FFs, saw nutrition information on menus, and used the information (fig. 8).[9] People who said they did not eat at FFs had higher HEI scores (by more than 5 points) than those who said they did. At the same time, those who said they used nutrition information at FFs had much higher HEI scores (54.4) than those who said they did not (48.4).[10] This correlation between the use of nutrition information and healthier diets has been found repeatedly in empirical studies and review articles that examined consumers' use of labels on store-bought food (Campos et al., 2011; Ollberding and Wolf, et al., 2010). Other studies and a review article by Drichoutis et al. (2006) have found that people who are more knowledgeable about, or place importance on, nutrition and health are more likely to use nutrition labels and read more of the information on labels (Bowman, 2005; Drichoutis, et al., 2005; Driskell, et al., 2008; Lin and Lee, 2004).

In addition to having lower HEI scores, Americans who go to FFs consume about 22 percent more sugar than those who do not go (fig. 9). But those who see FF menu nutrition information and use it have about 20 percent lower daily intake of sugar than those who see but do not use the information.

Figure 8

Americans who go to fast-food/pizza places (FFs) have lower HEI[1] scores than those who do not; those who use nutrition information on FF menus have higher HEI scores than those who do not



[1]HEI = Healthy Eating Index 2010. The maximum HEI score is 100. **Only respondents who answered affirmatively that they went to fast-food/pizza places were asked whether they saw nutrition information. Only those who answered affirmatively to the question about whether they saw nutrition information were asked whether they used menu nutrition information. See figure 1.

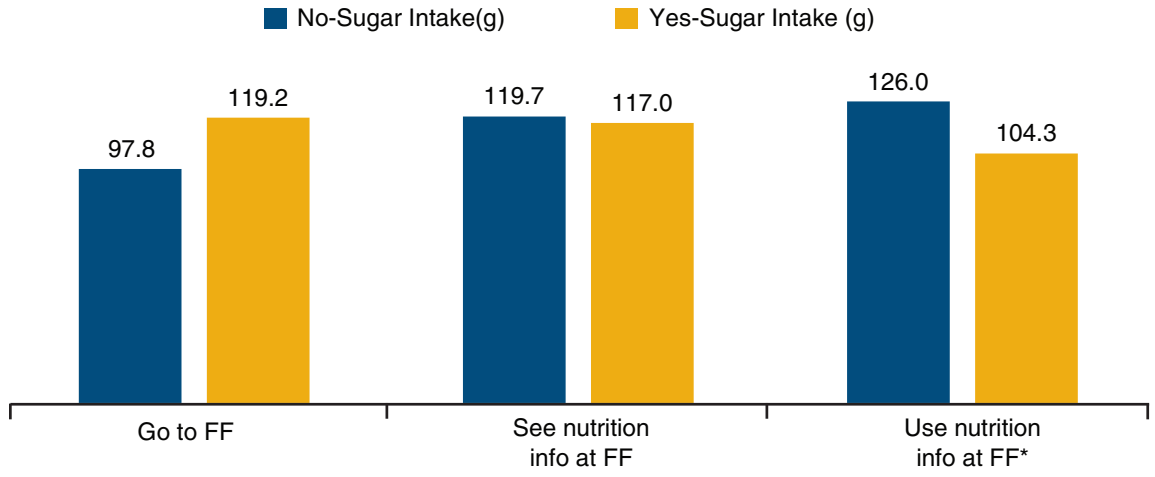
Source: Authors' calculations using NHANES 2007-08 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1)

[9]The HEI (developed by USDA's Center for Nutrition Policy and Promotion) measures each person's adherence to dietary guidance provided by the *Dietary Guidelines for Americans, 2005*. For more on the construction of the Healthy Eating Index, see Guenther et al. (2007). As mentioned earlier, we used only data from 2007-08 for this comparison because 2009-2010 HEI scores are not available.

[10]We note that, although these scores appear low, the mean HEI score for the entire population is below 60 (out of 100).

Figure 9

Americans who go to fast-food/pizza places (FFs) have higher sugar intake; those who use nutrition information at FFs have lower sugar intake



Note: g = grams.

*Only respondents who answered affirmatively to the question about whether they went to fast-food/pizza places were asked whether they saw nutrition information. Only those who answered affirmatively about whether they saw menu nutrition information were asked if they used it.

Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

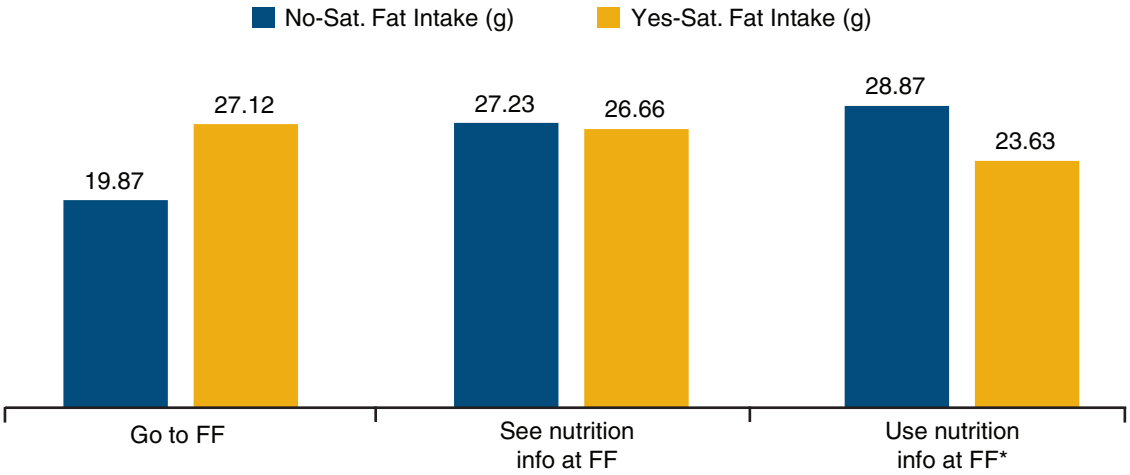
FF patrons also have notably higher intakes of saturated fat (27. 1 grams of saturated fat per day) compared with nonpatrons (19.9 grams) (fig. 10). FF patrons who do not use FF nutrition information have higher daily intakes of saturated fat than FF patrons who do use the information (29 versus 24 grams). Prior research has found that people who used nutrition labels on store-bought items also had lower intake of saturated fat and sugars, among other beneficial differences, in comparison with label nonusers (Ollberding et al., 2010).

Self-rated diet quality also varies with nutrition information use. Those who rate their diet healthfulness as "excellent" or "very good" are 23 and 18 percentage points more likely to use nutrition information at FFs than those who rate their diet healthfulness as "poor" (table 3).

In addition to diet quality, our data also describe dietary behavior. Respondents are asked how many times per week they eat fast food and food away from home. The relationship between these behaviors and FF nutrition information use echoes the pattern with respect to diet quality. For example, there is a strong negative correlation between eating out and use of nutrition information (fig. 11, table 4). People who report that they have two or fewer fast-food meals per week are (unsurprisingly) less likely to report that they ate out in the last year. Twenty-two percent of them notice nutrition information on the FF menu—essentially the same proportion as for those who eat more than five fast-food meals per week. But people with two or fewer fast-food meals per week who see nutrition information on the menu are about 45 percent more likely to use the information than people who say they eat more than five fast-food meals per week (44 percent versus 31 percent). Gregory, et al. (2011) have shown that consumers who eat out more often have lower self-reported diet quality, so it could be that those visiting FFs often are less health-conscious, but it could also be that these consumers lack food preparation skills or have time constraints. Also, it may be that the frequent FF patrons are already familiar with the menu and nutrition information and do not look at it as much.

Figure 10

Americans who go to fast-food/pizza places (FFs) have higher saturated fat intake; those who use nutrition information at FFs have lower saturated fat intake



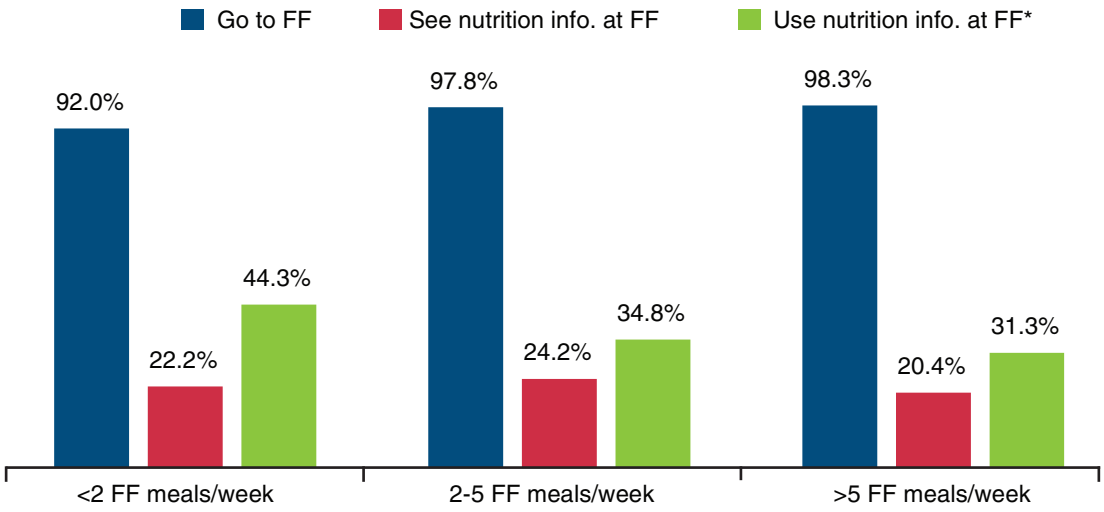
Note: g = grams.

*Only respondents who answered affirmatively to the question about whether they went to fast-food/pizza places were asked whether they saw nutrition information. Only those who answered affirmatively to the question about whether they saw nutrition information were asked whether they used menu nutrition information.

Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

Figure 11

Fast-food/pizza (FF) nutrition information and frequency of FF meals/week



*Only respondents who answered affirmatively to the question about whether they went to fast-food/pizza places were asked whether they saw nutrition information. Only those who answered affirmatively to the question about whether they saw nutrition information were asked whether they used menu nutrition information. See figure 1.

Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

Similar observations can be made about Americans who eat food away from home (FAFH)—which includes both food from FFs and FSRs (fig. 12, table 4). People who eat FAFH less than twice a week are less likely than those who eat out from two to five times and those who eat out more than five times per week to go to FFs. They are also much more likely to use available nutrition information than either of the other two groups (50 percent versus 41 and 35 percent, respectively). Finally, as we might expect, Americans who use the Nutrition Facts Panel (NFP) on store-bought foods are much more likely to use nutrition information in FFs (fig. 13, table 4).

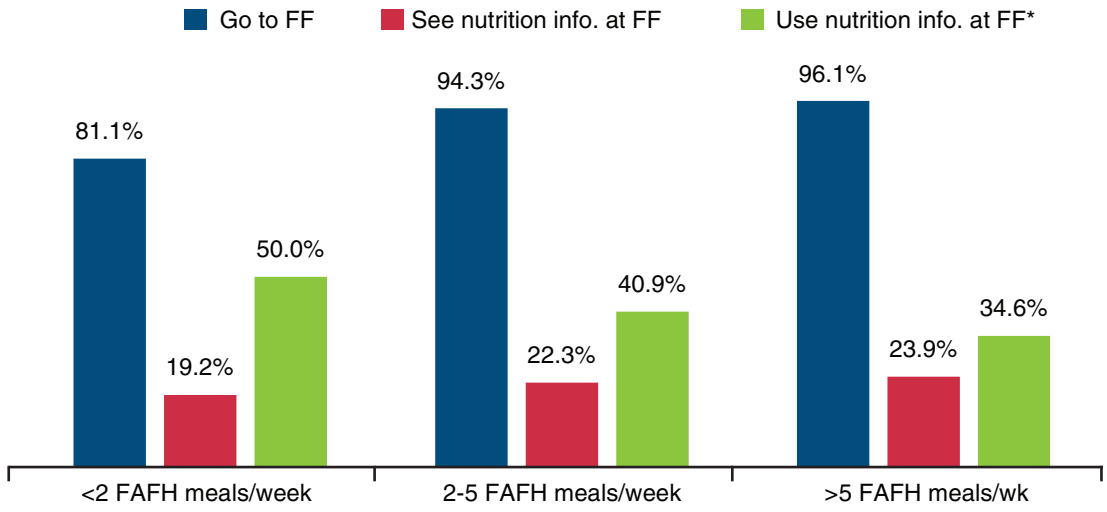
Nutrition Information Use in Full-Service Restaurants (FSRs)

Use by Gender, Ethnicity, and SNAP Participation

Men and women are about equally likely to go to full-service restaurants, but men are less likely to see nutrition information on FSR menus, and they are also less likely to use the information after seeing it (table 5, fig. 14). That is, men are 6 percentage points less likely to see nutrition information and 11 percentage points less likely to use it, compared with women. This result is similar to the result for FFs shown above.

Hispanics and Blacks are much less likely than Whites or people of other races to go to full-service restaurants (fig. 15). Hispanics are also the least likely of all racial/ethnic groups to notice nutrition information on menus at FSRs (i.e., 5, 10, and 2.5 percentage points less likely to see this information than Whites, Blacks, and those of other racial backgrounds, respectively). However, similar to Hispanics who eat at FFs, those who do notice the information are the most likely to use it, by a large margin: they are 20, 16, and 13 percentage points more likely to use nutrition information on FSR menus than Whites, Blacks, or people of other racial backgrounds, respectively.

Figure 12
Fast-food/pizza (FF) nutrition information and food away from home (FAFH) frequency

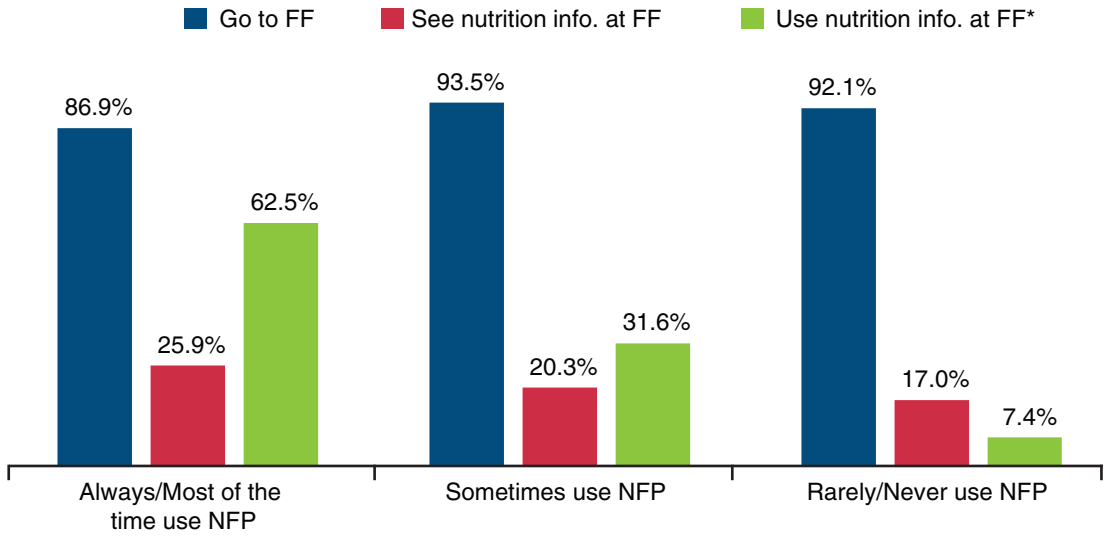


*Only respondents who answered affirmatively to the question about whether they went to fast-food/pizza places were asked whether they saw nutrition information. Only those who answered affirmatively to the question about whether they saw nutrition information were asked whether they used menu nutrition information.

Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

Figure 13

Americans who use the Nutrition Facts Panel (NFP) are more likely to use fast-food/pizza (FF) menu nutrition information

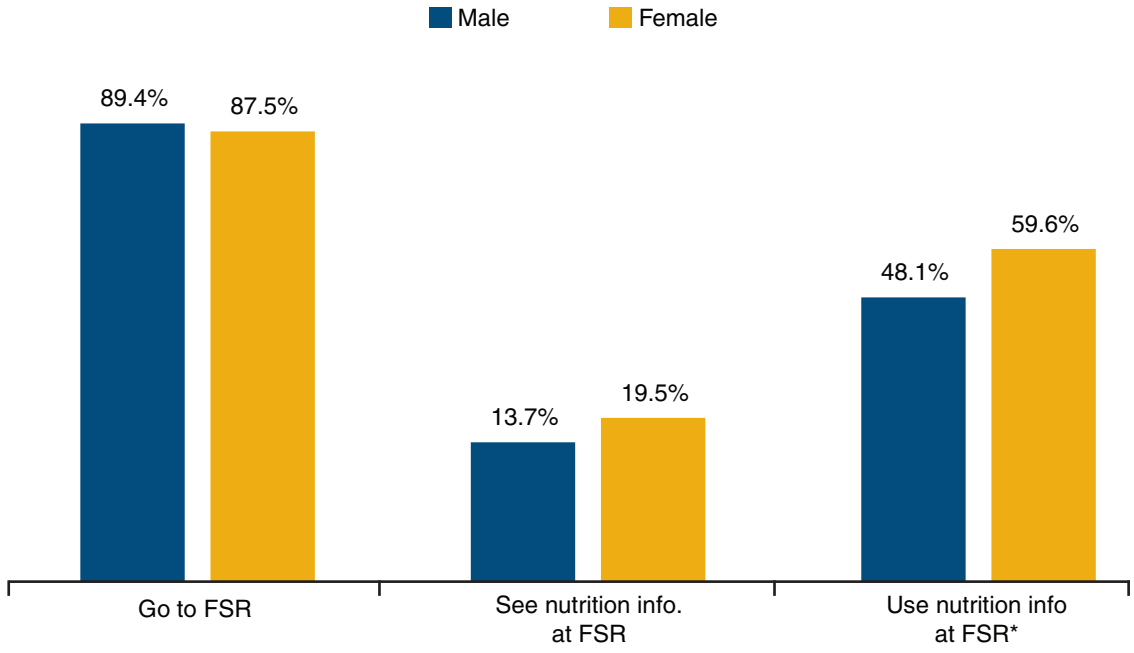


*Only respondents who answered affirmatively to the question about whether they went to fast-food/pizza places were asked whether they saw nutrition information. Only those who answered affirmatively to the question about whether they saw nutrition information were asked whether they used menu nutrition information.

Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

Figure 14

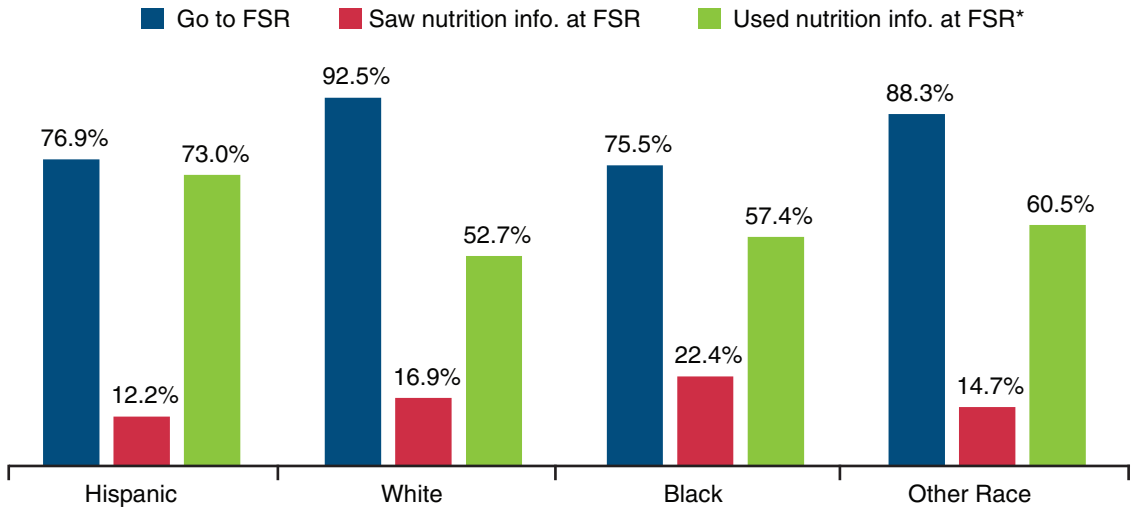
Nutrition information at full-service restaurants (FSRs) and gender



*Only respondents who answered affirmatively to the question about whether they went to full-service restaurants were asked whether they saw nutrition information. Only those who answered affirmatively to the question about whether they saw nutrition information were asked whether they used menu nutrition information.

Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

Figure 15
Race/ethnicity and use of nutrition information at full-service restaurants (FSRs)



*Only respondents who answered affirmatively to the question about whether they went to full-service restaurants were asked whether they saw nutrition information. Only those who answered affirmatively to the question about whether they saw nutrition information were asked whether they used menu nutrition information.

Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

SNAP participants are much less likely to eat at full-service restaurants than either low-income nonparticipants or higher income households, 65 percent versus 77 and 92 percent, respectively (fig. 16). While the differences in patronizing FSRs are stark, there is no statistically significant difference between the proportions of these populations that notice or use available nutrition information in FSRs.

Nutrition Information Users/Nonusers in FSRs: Relation to Diet Quality and Food Patterns

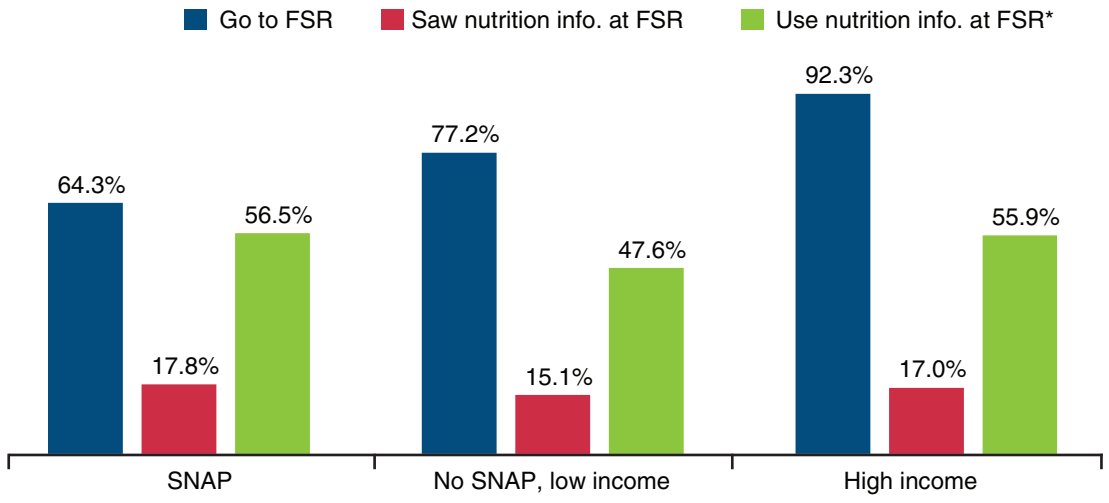
Americans who currently dine at FSRs (i.e., in the last 12 months) have higher saturated fat intake (by 3.9 grams per day) than those who don't go to FSRs. Those who, having gone to an FSR, see nutrition information on the menu have lower saturated fat intake—by a little over 1 gram—than those who don't see this information. Those who use nutrition information at FSRs consume about 7 grams less saturated fat per day than those who do not use this information (fig. 17, table 6).

The frequency with which people eat FAFH is negatively correlated with the likelihood of using nutrition information. Americans who eat FAFH more often are more likely to go to FSRs (table 7, fig. 18), but they are less likely to use nutrition information on FSR menus. That is, compared with people who ate FAFH less than twice per week, those who ate FAFH 2 to 5 times and more than 5 times per week were less likely to use FSR nutrition information (by 14 and 24 percentage points, respectively).

Respondents were asked how often they stored certain kinds of food—such as salty snacks, fruits, and dark green vegetables. The available responses were "always," "most of the time," "sometimes," "rarely," and "never." People who rarely or never have dark green vegetables at home are as likely to

Figure 16

SNAP participants are much less likely to go to full-service restaurants (FSRs) than both other low-income and higher income persons



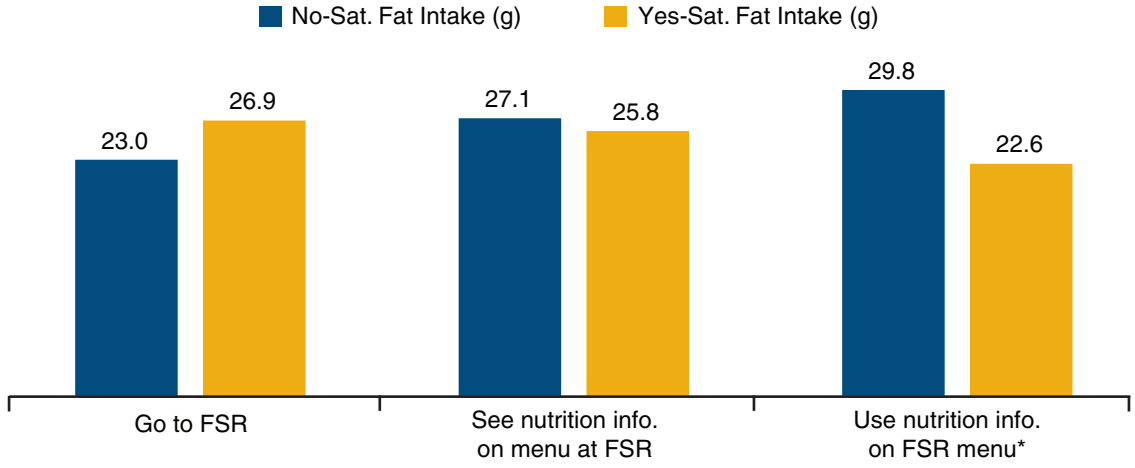
SNAP = Supplemental Nutrition Assistance Program.

*Only respondents who answered affirmatively to the question about whether they went to full-service restaurants were asked whether they saw nutrition information. Only those who answered affirmatively to the question about whether they saw nutrition information were asked whether they used menu nutrition information.

Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

Figure 17

Americans who go to full-service restaurants (FSRs) have higher saturated fat intake; those who use nutrition information at FSR have lower saturated fat intake



*Only respondents who answered affirmatively to the question about whether they went to full-service restaurants were asked whether they saw nutrition information. Only those who answered affirmatively to the question about whether they saw nutrition information were asked whether they used menu nutrition information.

Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

Table 6

Healthy Eating Index (HEI), sugar, and saturated fat intake of Americans who go to full-service restaurants, who see nutrition information there, who use nutrition information there, and who would use nutrition information there

	HEI	Sugar (g)	Saturated fat (g)
Go	50.8[t]	117.5	26.9[t]
	(0.41)	(1.29)	(0.31)
N	7,452	7,452	7,452
Did not go	48.2[t]	114.5	23.0[t]
	(0.67)	(3.55)	(0.7)
N	1,563	1,563	1,563
See	50.9	116.9	25.9
	(0.71)	(2.71)	(0.56)
	1,152	1,152	1,152
Did not see	50.8	117.7	27.1
	(0.43)	(1.27)	(0.37)
	6,278	6,278	6,278
Use	54.1[t]	106.1[t]	22.6[t]
	(0.77)	(3.05)	(0.46)
	491	491	491
Did not use	47.1[t]	130.4[t]	29.8[t]
	(0.88)	(5.03)	(1.02)
	491	491	491
Would use	52.2	112.0[t]	25.5
	(0.44)	(0.93)	(0.35)
	5,043	5,043	5,043
Would not use	48.0	125.2t	27.9
	(0.45)	(3.09)	(0.46)
	3,972	3,972	3,972

[t]For each survey question (each panel) and each column (e.g., HEI), groups with the same letter superscript have mean values that are significantly different ($p < 0.05$).

Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1). Standard errors are in parentheses.

Table 7

Proportion of Americans with specified diet behaviors who go to full-service restaurants (Go), see nutrition information there (See), use nutrition information there having seen it (Use), and would use nutrition information there (Would Use)

	Go	See	Use	Would Use
<2 fast-food meals/wk	0.918	0.168	0.598[xy]	0.659[xy]
	(0.006)	(0.010)	(0.021)	(0.010)
N	5,238	4,587	726	5,238
2-5 fast-food meals/wk	0.917	0.181	0.360[x]	0.574[x]
	(0.008)	(0.017)	(0.043)	(0.018)
N	1,248	1,097	180	1,248
>5 fast-food meals/wk	0.922	0.174	0.316[y]	0.539[y]
	(0.014)	(0.024)	(0.069)	(0.022)
N	508	459	79	508
<2 FAFH meals/wk	0.779[xy]	0.162	0.677[xy]	0.538[xy]
	(0.013)	(0.012)	(0.036)	(0.014)
N	3,546	2,506	357	3,546
2-5 FAFH meals/wk	0.924[xz]	0.170	0.539[xz]	0.644[x]
	(0.005)	(0.012)	(0.025)	(0.013)
N	3,892	3,463	556	3,892
>5 FAFH meals/wk	0.957[yz]	0.172	0.436[yz]	0.633[y]
	(0.006)	(0.014)	(0.044)	(0.016)
N	1,577	1,461	239	1,577
Always/most of time have salty snacks available at home	0.894[x]	0.177[x]	0.492	0.618[x]
	(0.013)	(0.017)	(0.039)	(0.015)
N	2,517	2,137	326	2,517
Sometimes have salty snacks available at home	0.866[x]	0.152[y]	0.611	0.607[x]
	(0.016)	(0.021)	(0.041)	(0.028)
N	1,053	847	130	1,053
Rarely/never have salty snacks avaiable. at home	0.870	0.130[xy]	0.639	0.579
	(0.021)	(0.021)	(0.071)	(0.025)
N	716	582	69	716
Always/most of time have dark green veg. available at home	0.884	0.176[x]	0.548[x]	0.625[x]
	(0.009)	(0.014)	(0.029)	(0.015)
N	3,360	2,808	429	3,360
Sometimes have dark green veg. available at home	0.899	0.143	0.552[y]	0.619[y]
	(0.020)	(0.020)	(0.092)	(0.025)
N	602	497	69	602
Rarely/never have dark green veg. available at home	0.862	0.098[x]	0.191[xy]	0.446[xy]
	(0.034)	(0.026)	(0.082)	(0.046)
N	323	260	27	323

—continued

Table 7

Proportion of Americans with specified diet behaviors who go to full-service restaurants (Go), see nutrition information there (See), use nutrition information there having seen it (Use), and would use nutrition information there (Would Use)—continued

	Go	See	Use	Would Use
Always/most of time have fruit available at home	0.890[x]	0.169[x]	0.541	0.623[x]
	(0.010)	(0.013)	(0.034)	(0.016)
N	3,715	3,127	468	3,715
Sometimes have fruit available at home	0.851[x]	0.156[y]	0.452	0.523[x]
	(0.013)	(0.034)	(0.127)	(0.031)
N	430	329	45	430
Rarely/never have fruit available at home	0.829	0.090[xy]	0.440	0.513
	(0.057)	(0.026)	(0.135)	(0.058)
N	141	110	12	141
Always/most of the time use Nutrition Facts Panel	0.877[x]	0.197[xy]	0.759[xy]	0.729[xy]
	(0.009)	(0.011)	(0.020)	(0.010)
N	3,715	3,127	468	3,715
Sometimes use Nutrition Facts Panel	0.911[xy]	0.158[x]	0.450[xz]	0.634[xz]
	(0.004)	(0.012)	(0.026)	(0.012)
N	430	329	45	430
Rarely/never use Nutrition Facts Panel	0.857[y]	0.130[y]	0.179[yz]	0.348[yz]
	(0.011)	(0.015)	(0.040)	(0.015)
N	141	110	12	141

x,y,z: For each survey question (each column) and each panel (e.g., FAFH frequency, use Nutrition Facts Panel), groups with the same letter superscript have mean values that are significantly different ($p < 0.05$).

Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1). Standard errors are in parentheses.

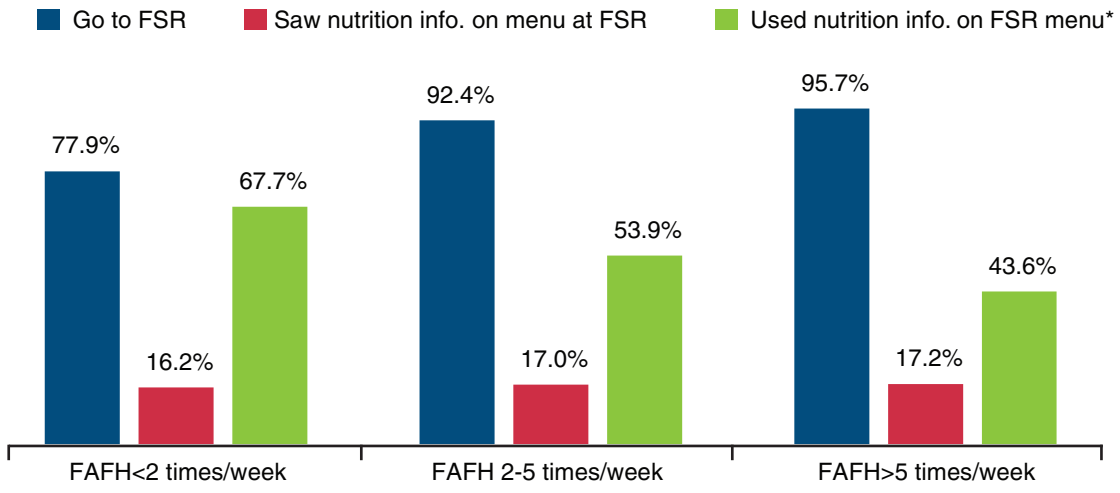
go to FSRs as people who always or most of the time have the vegetables, but they were less likely to see nutrition information on FSR menus (fig. 19). This "rarely or never" group was also less likely than all other groups to use nutrition information on FSR menus (i.e., 35 percentage points less likely than the "always or most of the time" group).

The frequency with which one uses nutrition information on the Nutrition Facts Panel (NFP) is also strongly related to whether one uses nutrition information at FSRs (fig. 20). Those who always or most of the time use the NFP are more likely to use FSR nutrition information than those who use the NFP sometimes, rarely, or never.[11]

[11]We collapse a small sixth category, "Never Seen," into the "Never" category. This does not affect the differences reported.

Figure 18

Americans who often eat food away from home (FAFH) use nutrition information at full-service restaurants (FSRs) less frequently than people who occasionally eat FAFH

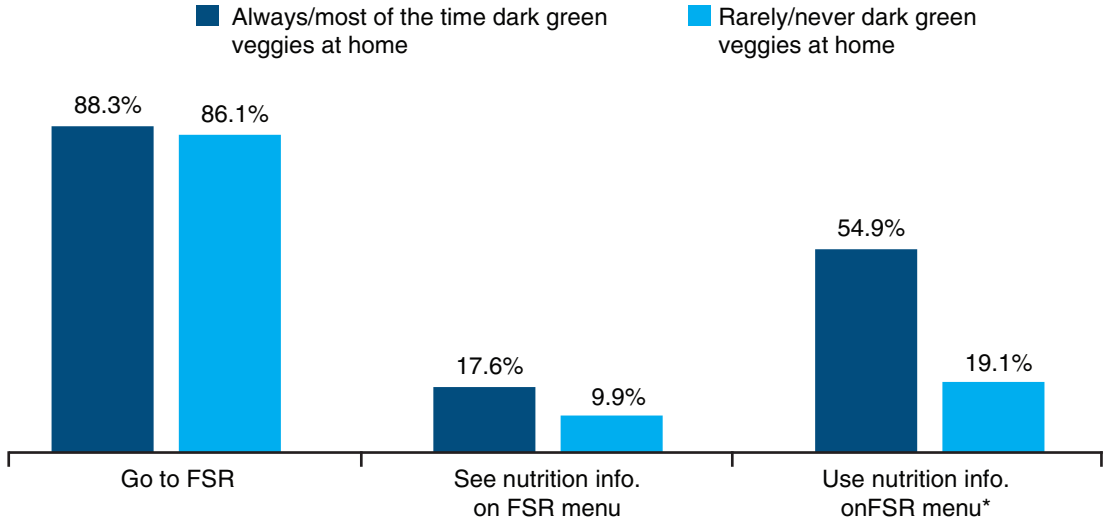


*Only respondents who answered affirmatively to the question about whether they went to full-service restaurants were asked whether they saw nutrition information. Only those who answered affirmatively to the question about whether they saw nutrition information were asked whether they used menu nutrition information.

Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

Figure 19

Americans who have dark green vegetables available at home are more likely to use full-service restaurant (FSR) nutrition information

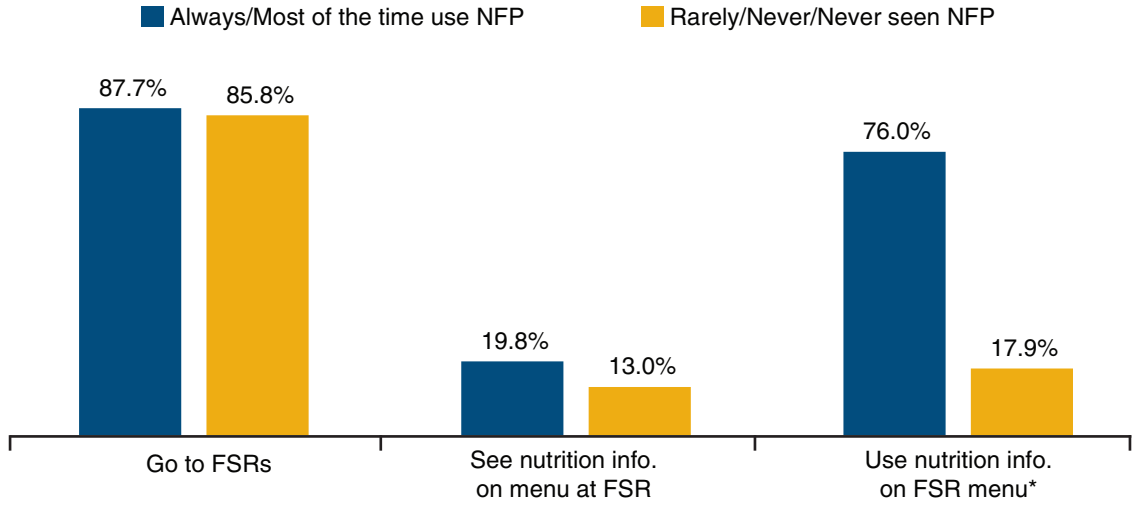


*Only respondents who answered affirmatively to the question about whether they went to full-service restaurants were asked whether they saw nutrition information. Only those who answered affirmatively to the question about whether they saw nutrition information were asked whether they used menu nutrition information.

Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

Figure 20

Americans who use Nutrition Facts Panels (NFPs) are more likely to use nutrition information on full-service restaurant (FSR) menus



Only respondents who answered affirmatively to the question about whether they went to fast-food/pizza places were asked whether they saw nutrition information. Only those who answered affirmatively to the question about whether they saw nutrition information were asked whether they used menu nutrition information.

Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

As with FFs, people who report using nutrition information at FSRs have better self-rated diets. While only 42 percent of those who rated their diet health as "poor" said they used nutrition information at FSRs, just over 70 percent of those who said that their diet health was "excellent" used it. Those who rated their diets as "very good" used nutrition information at FSRs 64 percent of the time (table 8).

Table 8

Self-assessed diet quality of those who go to full-service restaurants (Go), see nutrition information on the menu there (See), use nutrition information having seen it (Use), and would use the information in the future (Would Use)

	Go	See	Use	Would Use
Self-reported diet health excellent	0.857[st]	0.165	0.702[st]	0.645[st]
	(0.017)	(0.024)	(0.076)	(0.024)
N	791	639	103	791
Self-reported diet health very good	0.922[suvw]	0.160	0.642[uv]	0.678[uvw]
	(0.007)	(0.015)	(0.052)	(0.013)
N	1,940	1,693	274	1,940
Self-reported diet health good	0.894[tuxy]	0.167	0.556[w]	0.615[uxy]
	(0.008)	(0.010)	(0.032)	(0.011)
N	3,684	3,075	478	3,684
Self-reported diet health fair	0.849[vx]	0.169	0.415[suw]	0.533[svxz]
	(0.009)	(0.016)	(0.049)	(0.014)
N	2,136	1,675	242	2,136
Self-reported diet health poor	0.804[wy]	0.223	0.421[tv]	0.445[twyz]
	(0.027)	(0.038)	(0.093)	(0.027)
N	461	347	55	461

[s,t,u,v,w,x,y,z] For each survey question (each column) and each panel (ieself-reported diet health), groups with the same letter superscript have mean values that are significantly different ($p < 0.05$).

Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1). Standard errors are in parentheses.

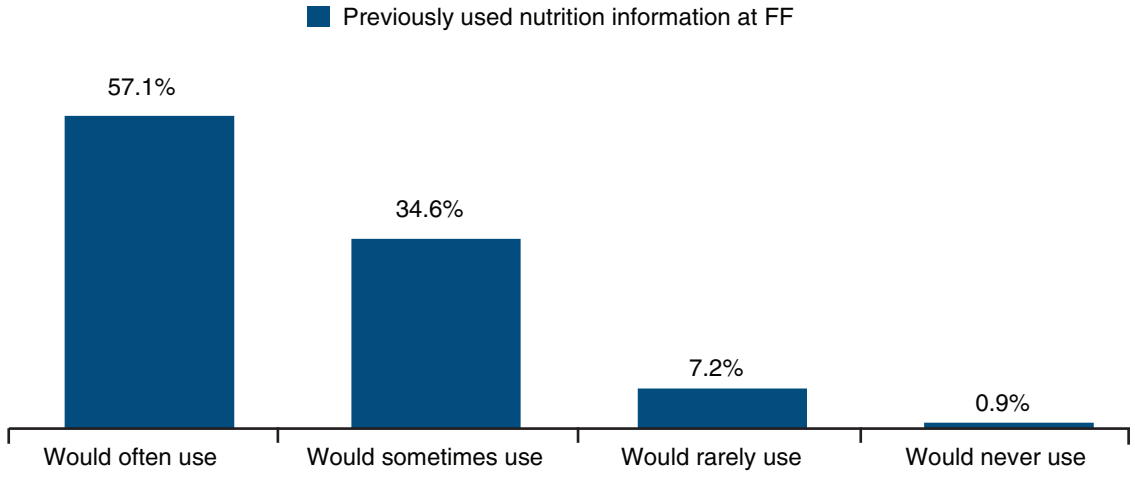
Who Would Use Nutrition Information If It Were Readily Available?

The FCBS phone followup module also asks of those who had been to an eating establishment in the last 12 months how often they *would* use nutrition or health information in FFs and FSRs if it were available. Response options were "often," "sometimes," "rarely," and "never." As with actual use of nutrition information, we found a strong relationship between dietary habits and people's assessments of how frequently they would use nutrition information.

For example, having used nutrition information in the past is positively correlated with stated willingness to use it in the future. Among individuals who have used nutrition information on FF menus in the past, a majority (57.1 percent) say they would "often" use nutrition information at FFs in the future (fig. 21), while only 34.6 percent say they would "sometimes" use it; just 8 percent said that they would "rarely" or "never" use the information. FSR findings are just as stark (fig. 22): more than 55 percent of those who have used nutrition information at FSRs said they would use it "often" in the future and just 4 percent said "rarely" or "never."

HEI score is also strongly correlated with declared willingness to use nutrition information in FAFH establishments (figs. 23 and 24).[12] People who say that they would use such information "often" in both FF and FSR settings have the highest average HEI scores, followed by those who say they would use it "sometimes." In the context of FSRs, both the "often" and "sometimes" groups have

Figure 21
Those who have used nutrition information at fast-food/pizza places (FFs) in the past most often say they would use it "often" in the future

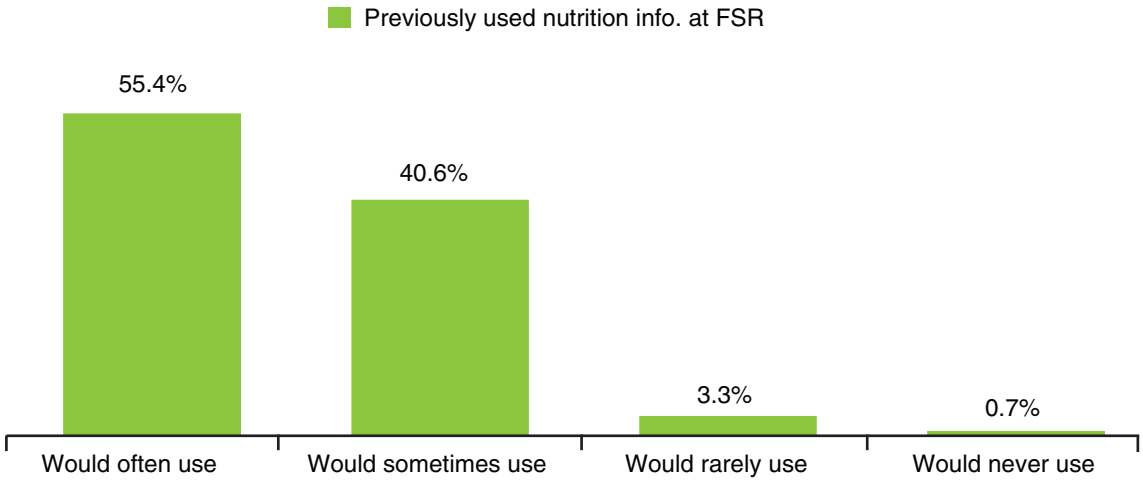


Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

[12]As noted above, because HEI scores are currently available for the 2007-08 wave only, we use these data for the graphs.

Figure 22

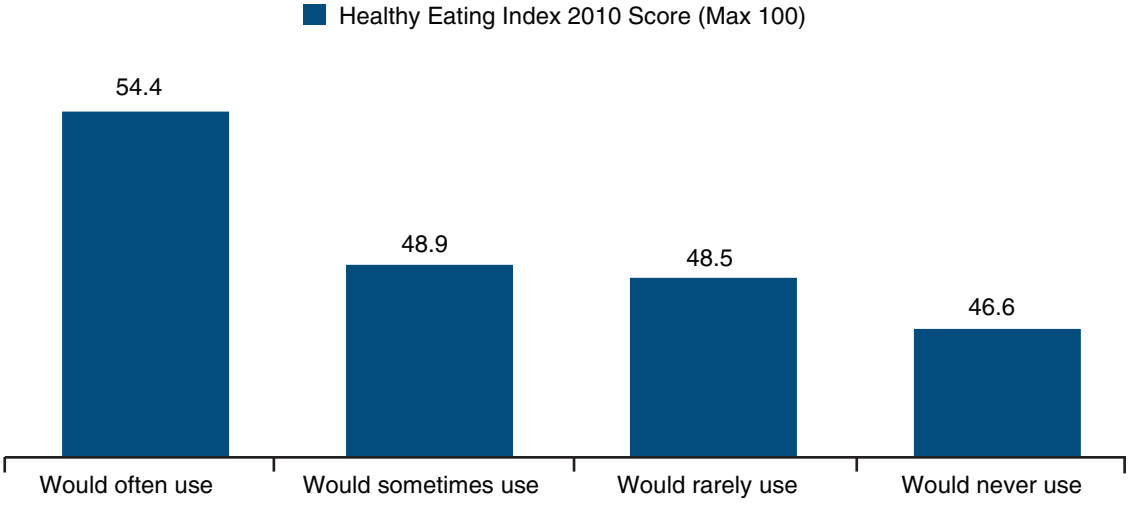
Those who have used nutrition information at a full-service restaurant (FSR) in the past most often say they will use it "often" in the future



Source: Authors' calculations using NHANES 2007-10 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

Figure 23

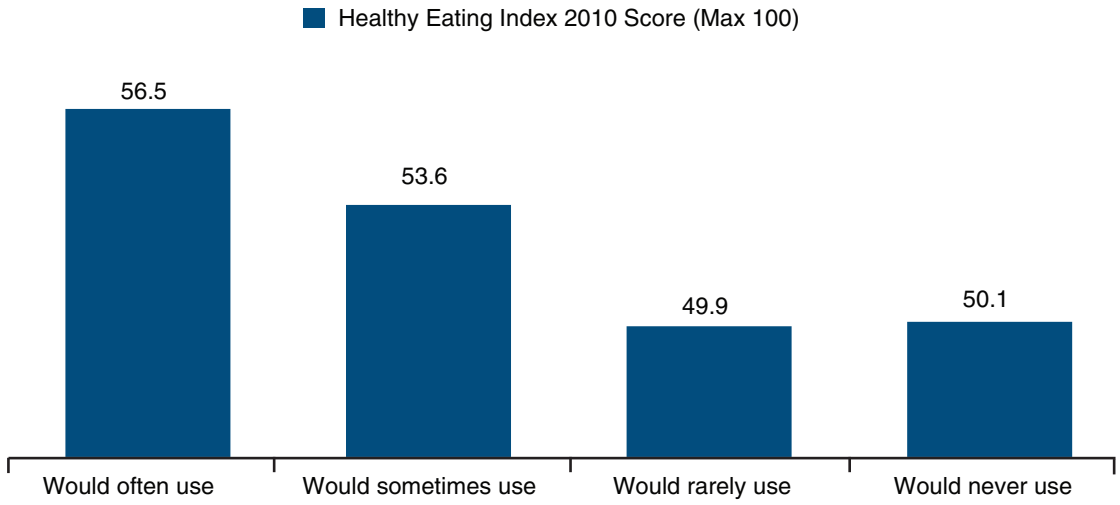
Would you use nutrition information in fast-food/pizza places (FFs) in deciding what to order?



Source: Authors' calculations using NHANES 2007-08 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

Figure 24

Would you use nutrition information in full-service restaurants (FSRs) in deciding what to order?



Source: Authors' calculations using NHANES 2007-08 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

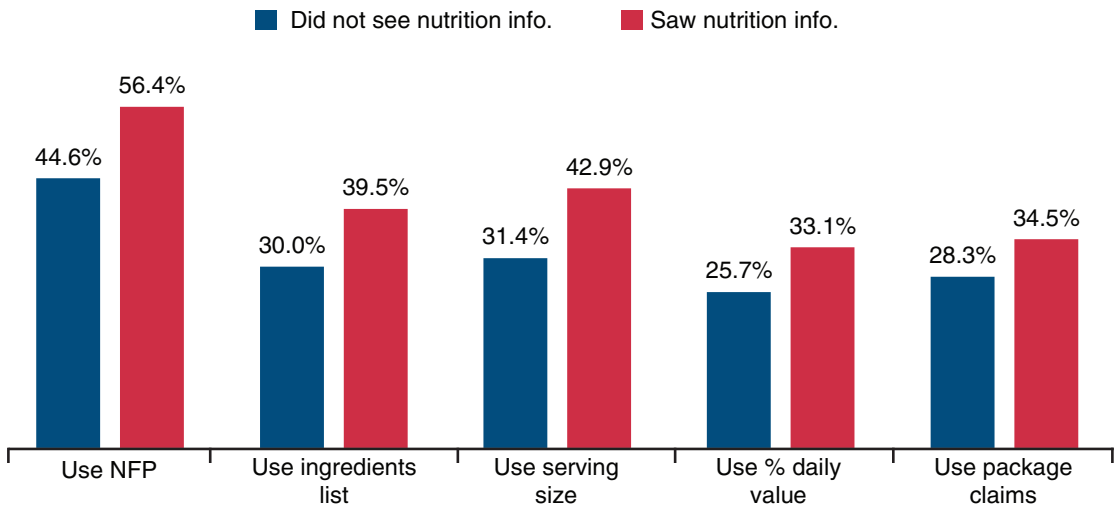
significantly higher HEI scores than the "rarely" and "never" groups. In the context of FFs, those who say they would use nutrition information "often" have significantly higher HEI scores than all other respondents, and the "sometimes" group has a higher HEI score than the "never" group.

Our data allow us to look more closely at the differences between those who say they saw nutrition information on their previous visit to a FF or FSR and those who say they did not see it. It could be that those who say they saw this information on menus were going to establishments that were already posting the information, while the others were not going to these establishments. On the other hand, it could be that the information was available for both groups of people and the people who saw it were simply more attentive to such information.

Our data offer evidence to support the second of these hypotheses. In the context of both FSRs and FFs, the HEI scores, saturated fat intake, and sugar intake among those who did and did not see nutrition information at their last visit to FF/FSR are not statistically different (tables 2 and 5). Since their actual diets are not much different, it seems plausible that they could be going to the same kinds of establishments. However, those who say that they see nutrition information at FFs and FSRs appear to be more attentive to nutrition information in the context of food at home, as they are more likely to use the Nutrition Facts Panel, ingredients list, serving size information, percent daily values, and health claims on foods purchased from the store (figs. 25 and 26).

Figure 25

Those who see nutrition information at fast-food/pizza places (FFs) are more likely to use nutrition information in other contexts



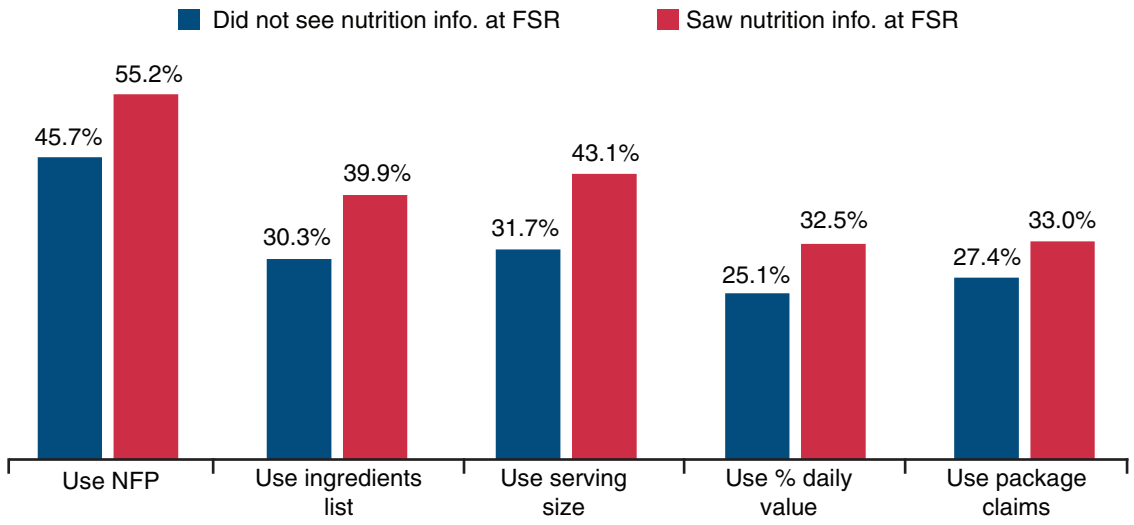
NFP=Nutrition Facts Panel; % daily values based on a 2,000-calorie diet.

Sample limited to those who say that they would use FF menu nutrition information "often" or "sometimes."

Source: Authors' calculations using NHANES 2007-08 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1).

Figure 26

Those who see nutrition information at full-service restaurants (FSRs) are more likely to use nutrition information in other contexts



NFP=Nutrition Facts Panel; % daily value based on a 2,000-calorie diet.

Source: Authors' calculations using NHANES 2007-08 data. Survey design accounted for; observations are weighted using the day 1 dietary survey weight (WTDRD1). Sample limited to those who say that they would use FSR menu nutrition information "often" or "sometimes."

Discussion

Fast-food and full-service restaurants are a large and growing source of calories in the American diet. However, the kind of nutrition information that has been available for most store-bought foods has—until recently—been absent from food at FFs or FSRs. The Patient Protection and Affordable Care Act (ACA) of 2010 took the first step in making such information universally available by requiring restaurant and fast-food chains with 20 or more outlets to provide minimal nutrition information on the menu.

In the context of the changes mandated by the ACA, an open question is whether consumers will use the calorie information that is posted. To establish a baseline against which to measure changes in the use of on-site nutrition information about food away from home, we examine data that show who used nutrition information on menus at FAFH establishments before the implementation of the ACA. We used data from two recent waves of the phone followup portion of the Flexible Consumer Behavior Survey module in NHANES to examine consumers' attitudes and use of nutrition labels in FFs and FSRs. We examined differences in attitudes across demographic characteristics and across dietary behaviors and diet quality.

A key assumption behind the push to provide consumers with nutrition information—as mandated by the ACA— is that consumers with this information will use it to improve their diets. But this nutrition-information effect may be stronger for some consumers than for others. For example, the diets of consumers who use nutritional information are markedly better than the diets of consumers who do not use it. This may imply that consumers who already use labels in supermarkets and follow healthy diets are more likely to use nutrition information in restaurants—indeed, our results suggest as much. Thus, it appears that consumers who already have healthful diets may be more likely to benefit from the mandatory disclosure of nutrition information and that mere exposure to the nutritional labels may not be enough to motivate those who do not benefit from mandatory disclosure of nutrition information.

Our results also indicate that consumers who eat in restaurants more often are less likely to use nutrition information provided there. Possibly consumers who frequent restaurants are already familiar with the nutrition information provided and therefore do not use it, or they may be less inclined toward a healthy diet. In the latter case, it may be too optimistic to expect that after implementation of the disclosure law, consumers who have not used nutrition information will adopt healthier diets. One concern, then, about the labeling mandate is whether it will increase nutrition and health disparities between those who currently do and do not use nutrition information by increasing the dietary health of people who already use nutrition information while grocery shopping and eating out. If this is the case, then further work on how best to increase use of nutrition information and dietary health among people with subpar diets is critical.

Obviously, providing information is only useful if consumers avail themselves of it. While it is true that almost everybody eats out, during the periods we studied, just 21 percent of consumers saw nutrition information in FFs and 17 percent saw such information in FSRs. Thus, despite the voluntary posting of nutrition information by some restaurants in the study periods, the majority of consumers were not exposed to nutrition information while eating out. However, with the implementation of mandatory menu labeling, we might expect to see a dynamic like the one that occurred in New York: before implementation of mandatory calorie labeling—just 25 percent of

consumers saw this information, but after implementation, the number increased to 72 percent (Dumanovsky, et al., 2010).

Who were the consumers who did see nutrition information on menus? In FFs, Whites and Blacks were more likely to see nutrition information than other racial/ethnic groups; in FSRs, women and Blacks were more likely to see the information than their respective gender and racial/ethnic counterparts. It is unclear how much of these differences is due to the characteristics of the venue and how much is due to the attentiveness of the consumer. Healthier restaurants may have more incentive to voluntarily disclose nutrition information, and consumers who frequent these restaurants may be more health-conscious than the population as a whole, so whether people see this information may be only an indicator of whether they go to healthier places. In the future, knowing who is most attentive to nutrition information may offer a sense of which groups could be targeted for information delivery.

What are the characteristics of those who are more likely to use nutrition information when they see it? SNAP participants are more likely to use nutrition information in FFs than are the high- or low-income individuals not receiving SNAP. Consistent with much of the literature, we also find that race and gender are correlated with use of nutrition information: men and Whites who see nutrition information are much less likely to use it than women and minorities. Hispanics are especially likely to use nutrition information if they report seeing it.

Our results are also suggestive of the kinds of nutrition information important that are to consumers who frequent FFs and FSRs. People who say they use nutrition information at FFs and FSRs indicate that they already use label information concerning serving sizes, percent daily values, and health claims on packages. This is instructive because it highlights the kind of information that is most familiar and perhaps most effective for users of FF and FSR nutrition information. Looking forward, researchers may investigate how such information can be provided in these eating-out contexts and whether such information is effective in informing consumers' choices—especially of those who are not accustomed to seeing it and using it in FF/FSR contexts.

We urge caution in interpreting the results of this report. The results show only correlations between variables and they should not be interpreted as causal. Furthermore, we use self-reported survey data, in which survey participants can purposely or accidentally distort information about their behavior. A particular problem in analyzing self-reported behavior is social-desirability bias, wherein participants answer the question based on how they would like to be perceived rather than on how they actually behave.

Taken as a whole, our results suggest that there is a fairly wide range of attitudes toward nutrition information and its use, both at home and away from home. Although mandatory menu labeling intends to lower the cost of nutrition information for all consumers, we surmise, based on our data, that those who already avail themselves of nutrition information or already have healthy diets are most likely to benefit from labeling. The implementation of the ACA will offer researchers a good opportunity to study the nationwide effect of nutrition information in restaurants and fast-food and pizza establishments. Such research will be important as Americans' diets and the availability of FAFH nutrition information evolve.

References

Bowman, S.A. 2005. ”Food shoppers’ nutrition attitudes and relationship to dietary and lifestyle practices,” *Nutrition Research 25*(3):281-93. doi: http://dx.doi.org/10.1016/j.nutres.2004.11.004.

Brownell, K.D., T. Farley, W.C. Willett, B.M. Popkin, F.J. Chaloupka, J.W. Thompson, and D.S. Ludwig. 2009. “The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages,” *New England Journal of Medicine 361*(16):1599-1605. doi: doi:10.1056/NEJMhpr0905723.

Campos, S., J. Doxey, and D. Hammond. 2011. “Nutrition labels on pre-packaged foods: a systematic review,” *Public Health Nutrition 14*(08):1496-1506. doi: doi:10.1017/S1368980010003290.

Cash, S.B., D.L. Sunding, and D. Zilberman. 2005. “Fat Taxes and Thin Subsidies: Prices, Diet, and Health Outcomes,” *Food Economics - Acta Agriculturae Scandinavica, Section C, 2*(3-4):167-174. doi: 10.1080/16507540500534879.

Center for Science in the Public Interest. 2009. Nutrition labeling in chain restaurants: state and local bills/regulations--2007-2008. February 6, 2013, http://www.cspinet.org/nutritionpolicy/MenuLabelingBills2007-2008.pdf.

Center for Science in the Public Interest. 2011. State and local menu labeling policies. February 6, 2013, http://cspinet.org/new/pdf/ml_map.pdf.

Chouinard, H.H., D.E. Davis, J.T. LaFrance, and J.M. Perloff. 2007. “Fat taxes: big money for small change,” *Forum for Health Economics & Policy 10*(2), Article 2.

Davis, D.E., and H. Stewart. 2002. “Changing consumer demands create opportunities for U.S. food system,” *FoodReview 25*(1):19-23.

Drichoutis, A.C., P. Lazaridis, and R.M. Nayga. 2005. “Nutrition knowledge and consumer use of nutritional food labels,” *European Review of Agricultural Economics 32*(1):93-118. doi: 10.1093/erae/jbi003.

Drichoutis, A.C., P. Lazaridis, and Rodolfo M. Nayga. 2006. “Consumers’ use of nutritional labels: a review of research studies and issues,” *Academy of Marketing Science Review 10*(9).

Driskell, J.A., M.C. Schake, and H.A. Detter. 2008. “Using Nutrition Labeling as a Potential Tool for Changing Eating Habits of University Dining Hall Patrons,” *Journal of the American Dietetic Association 108*(12):2071-76.

Dumanovsky, T., C.Y. Huang, M.T. Bassett, and L.D. Silver. 2010. “Consumer awareness of fast-food calorie information in New York City after implementation of a menu labeling regulation,” *American Journal of Public Health 100*(12):2520-25.

Goldman, D., and D. Lakdawalla. 2001. Understanding Health Disparities Across Education Groups. National Bureau of Economic Research Working Paper No. 8328. www.nber.org/papers/w8328.

Gregory, C., T.A. Smith, and M. Wendt. 2011. *How Americans Rate Their Diet Quality: An Increasingly Realistic Perspective*. U.S. Department of Agriculture, Economic Research Service, EIB-83, September.

Guenther, P.M., J. Reedy, S. Krebs-Smith, B.B. Reeve, and P.P. Basiotis. 2007. Development and Evaluation of the Healthy Eating Index-2005. *Technical Report*: U.S. Department of Agriculture.

Jacobson, M.F., and K.D. Brownell. 2000. "Small taxes on soft drinks and snack foods to promote health," *American Journal of Public Health 90*(6):854-57. doi: 10.2105/ajph.90.6.854.

Kim, S.Y., R.M. Nayga, and O. Capps. 2001. "Food Label Use, Self-Selectivity, and Diet Quality," *Journal of Consumer Affairs 35*(2):346-63. doi: 10.1111/j.1745-6606.2001.tb00118.x.

Kim, S.Y., R.M. Nayga, and C. Oral. 2000. "The effect of food label use on nutrient intakes: an endogenous switching regression analysis," *Journal of Agricultural and Resource Economics 25*(1):215-31.

Krukowski, R.A., J. Harvey-Berino, J. Kolodinsky, R.T. Narsana, and T.P. DeSisto. 2006. "Consumers May Not Use or Understand Calorie Labeling in Restaurants," *Journal of the American Dietetic Association 106*(6):917-20. doi: http://dx.doi.org/10.1016/j.jada.2006.03.005.

Lin, B.-H., and J. Guthrie. 2012. *Nutritional Quality of Food Prepared at Home and Away From Home*. U.S. Department of Agriculture, Economic Research Service, EIB-105, December.

Lin, C.T.J., and J.Y. Lee. 2004. "Who Uses Food Label Information?" *Journal of Food Products Marketing 10*(4):17-37. doi: 10.1300/J038v10n04_02.

Nayga, R.M. Jr. 1999. "Toward an understanding of consumers' perceptions of food labels," *International Food and Agribusiness Management Review 2*(1):29-45.

Ollberding, N.J., R.L. Wolf, and I. Contento. 2010. "Food Label Use and Its Relation to Dietary Intake among US Adults," *Journal of the American Dietetic Association 110*(8):1233-37. doi: http://dx.doi.org/10.1016/j.jada.2010.05.007.

Rahkovsky, I., and C.A. Gregory. 2013. "Food prices and blood cholesterol," *Economics & Human Biology 11*(1):95-107.

Seiders, K., and R.D. Petty. 2004. "Obesity and the Role of Food Marketing: A Policy Analysis of Issues and Remedies," *Journal of Public Policy & Marketing 23*(2):153-69.

Stewart, H., N. Blisard, and D. Jolliffe. 2006. *Let's Eat Out: Americans Weigh Taste, Convenience, and Nutrition*. U.S. Department of Agriculture, Economic Research Service, EIB-19.

The Patient Protection and Affordable Care Act (2010). January 27, 2013, http://www.gpo.gov/fdsys/pkg/BILLS-111hr3590enr/pdf/BILLS-111hr3590enr.pdf.

Todd, J.E., L. Mancino, and B.H. Lin. 2010. *The Impact of Food Away From Home on Adult Diet Quality*. U.S. Department of Agriculture, Economic Research Service, ERR-90. February.

U.S. Food and Drug Administration. 2012a. New Menu and Vending Machines Labeling Requirements, January 27, 2013, http://www.fda.gov/food/labelingnutrition/ucm217762.htm.

U.S. Food and Drug Administration. 2012b. Overview of FDA Proposed Labeling Requirements for Restaurants, Similar Retail Food Establishments and Vending Machines. January 27, 2013, http://www.fda.gov/Food/LabelingNutrition/ucm248732.htm.

Variyam, J.N. 2005. *Nutrition Labeling in the Food-Away-From-Home Sector: An Economic Assessment.* U.S. Department of Agriculture, Economic Research Service, ERR-4. February.

Variyam, J.N. 2008. "Do nutrition labels improve dietary outcomes?" *Health Economics 17*(6): 695-708. doi: 10.1002/hec.1287.

Wootan, M.G., and M. Osborn. 2006. "Availability of Nutrition Information from Chain Restaurants in the United States," *American Journal of Preventive Medicine 30*(3):266-68. doi: http://dx.doi.org/10.1016/j.amepre.2005.10.006.

Wu, H.W., and R. Sturm. 2013. "What's on the menu? A review of the energy and nutritional content of US chain restaurant menus," Public Health Nutrition 16(01):87-96. doi: doi:10.1017/S136898001200122X.