

Menu Labeling: Does Providing Nutrition Information at the Point of Purchase Affect Consumer Behavior?

Healthy Eating Research

Building evidence to prevent childhood obesity

A Research Synthesis, June 2009

Americans spend nearly half of their food budget on away-from-home food, and 45 percent of adults agree that restaurants are an essential part of their lifestyle.¹ In addition to purchasing meals for their own consumption, parents frequently purchase restaurant foods for their children.^{2,3} The majority of parents report purchasing restaurant food for a family meal one or more times per week.² Annual restaurant sales are projected to total \$395 billion by the end of 2009, up from \$42.8 billion in 1970.^{1,4}

Dramatic increases in the consumption of away-from-home meals over the past 40 years have prompted growing interest in menu labeling, the practice of providing information on calories, fat, sodium and other selected nutrients in menu items at points of purchase, as a strategy to reduce obesity and diet-related chronic disease. This research synthesis reviews studies that have examined the use of menu labeling in away-from-home food establishments, such as restaurants and cafeterias, and the potential impact of labeling on consumers' food and beverage selections.

Eating out frequently, particularly at quick-service or fast-food restaurants, is related to greater weight gain and obesity.⁵⁻¹⁴ Studies about adults,^{7-9, 15} adolescents¹⁶⁻¹⁹ and children^{15, 20} have found that frequently eating in restaurants is related to higher intakes of fat, sodium and soft drinks, and lower intakes of nutrient-dense foods, such as vegetables. A 2008 health impact assessment conducted in Los Angeles County further suggests that annual weight gain in the county's population could be reduced by 39 percent if menu labeling led to just 10 percent of major chain restaurant patrons ordering meals moderately lower in calories (estimate based on an average reduction of 100 calories).²¹ While the Nutrition Labeling and Education Act of 1990 requires that packaged foods and beverages are labeled with a standard nutrition facts panel that includes calories, restaurants are not bound by any federal regulations to provide nutrition information for menu items unless restaurants make specific health claims.²²

In recent years, a number of states and localities have considered proposals that would require menu labeling in restaurants; however, to date, few such policies have passed.²³ For example, regulations in New York City were passed that require chain restaurants to post calorie information for all standard items on menus and menu boards. The first statewide bill to be passed will require chain restaurants throughout California to post calorie information starting in January 2011. As additional



labeling regulations are being considered, the potential benefits of such legislation for public health and barriers to implementation need to be well understood.

Research Results

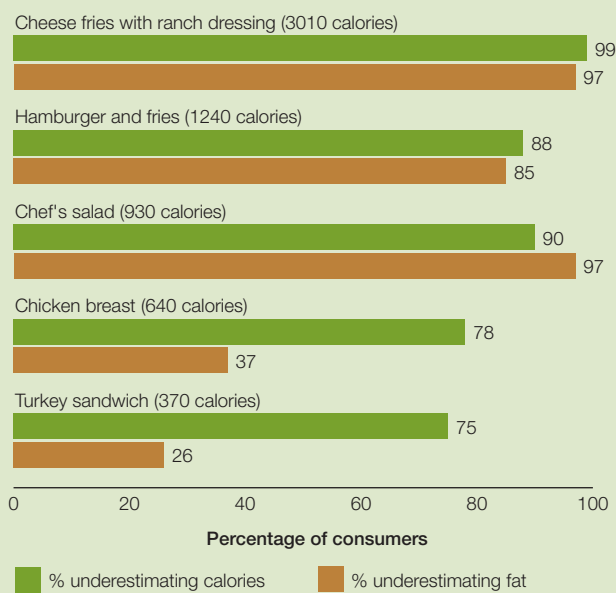
- The number of U.S. restaurants that provide nutrition information has increased over the past decade; however, the majority of restaurants do not provide consumers with nutrition information at the point of purchase (e.g., on the menu).^{24, 25}
- Most consumers underestimate the number of calories and fat in away-from-home foods and tend to make greater errors when menu items are high in calories (see figure 1) or when ordering from establishments that promote their menu items as healthy.²⁶⁻²⁸
- Most consumers would like to see nutrition information at places where they go out to eat; however, only limited research has explored how well this information is understood by consumers and which consumers may be most likely to use menu labels in making decisions about what to purchase.²⁹⁻³³



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- Menu labeling reduces consumers' intentions to purchase items high in calories and fat, especially when there is a greater discrepancy between the perceived content and actual content.^{27, 34-37}
- Although some research has found that menu labeling at the point of purchase modestly improves consumers' selection of healthier menu items,³⁸⁻⁵¹ a few studies have shown labeling may lead to higher energy intake among some population subgroups, such as college-age men.^{33, 52} Additional research is needed to understand the potential for menu labeling to have a significant beneficial impact on purchasing patterns among diverse demographic groups.
- Requiring restaurants to provide point-of-purchase nutrition information could help reduce obesity by promoting the introduction of healthier menu options.⁵³ The field currently lacks research that evaluates the impact of menu labeling regulations on changes in the nutritional quality of menu options.
- In the past, the restaurant industry raised several potential obstacles to providing point-of-purchase nutrition information.^{54, 55} At this time, it is unclear whether these perceived obstacles would impede the implementation of proposed menu labeling requirements or reduce restaurant revenues.

Figure 1. Percentage of Surveyed Consumers Who Underestimated the Calories and Fat in Common Restaurant Menu Items



Burton S, Creyer E, Kees J and Huggins K. "Attacking the obesity epidemic: the potential health benefits of providing nutrition information in restaurants." *American Journal of Public Health*. 96(9): 1669-1675, September 2006.

Details on Key Research Results

The number of U.S. restaurants that provide nutrition information to consumers has increased over the past decade; however, the majority of restaurants do not provide consumers with nutrition information at the point of purchase (e.g., on the menu).^{24, 25}

At least three studies published in the past five years have examined the availability of nutrition information at U.S. chain restaurants.^{24, 25, 56} The findings show that the number of major chain restaurants providing nutrition information for consumers increased from 35 percent in 1994 to 54 percent in 2004.²⁴ More recently, in 2005, the National Restaurant Association launched the "Ask Us!" program to assist restaurant operators in providing nutrition information to consumers through the provision of free resources and tools.⁵⁷

Among chain restaurants providing nutrition information, most chains (82%) have made information on several key nutrients available for the majority of their menu items in at least one format (e.g., on menu boards, table top displays, brochures and posters).²⁴ A large proportion of these restaurants (86%) publish nutrition information on the company Web site, but nutrition information is less often available at the point of purchase.^{24, 25} For example, surveyors visited 88 percent (n=29 of 33) of the outlets of a major fast-food restaurant chain in Washington, D.C., and found that only 59 percent of the outlets provided nutrition information for the majority of menu items.²⁵ Another study found that, if on-premises nutrition information is not displayed prominently, it may not be used frequently.⁵⁸

Other findings indicate nutrition information may be available less often on menus in locally owned, non-chain restaurants.⁵⁹ Compared with fast-food restaurants, sit-down restaurants also are less likely to post nutrition information near the point of purchase.⁶⁰

Most consumers underestimate the number of calories and fat in away-from-home foods, and they tend to make greater errors when menu items are high in calories or when they're ordering from establishments that promote their menu items as healthy.²⁶⁻²⁸

Research among adults indicates it is difficult to accurately estimate the number of calories in restaurant foods.^{27, 28} For example, one study provided 193 adult consumers with serving size information and brief descriptions for nine common restaurant menu items with varied levels of calories and fat.²⁷ A majority of consumers (73%) underestimated the number of calories in light entrees by an average of 43 calories. The light

entrees actually had 370 to 543 calories. And nearly all consumers (90%) underestimated the number of calories in less-healthy entrees by an average of 642 calories. The less-healthy entrees actually had 930 to 1660 calories.

A few studies have provided evidence to further suggest that health claims made by restaurants lead consumers to underestimate the number of calories in entrees and to order higher-calorie side dishes, drinks or desserts.²⁶ In one study, 316 consumers were asked to estimate the number of calories contained in two entrée sandwiches equivalent in calories—one from a restaurant menu promoted as being healthy, and the other from a popular burger-and-fries restaurant menu. Among consumers who reported paying little regular attention to nutrition information, the number of calories in a 600-calorie sandwich was underestimated by 247 calories when it was from the menu of a “healthy” restaurant, compared with only 40 calories when it was from the menu of a burger-and-fries restaurant. Consumers who reported paying close attention to nutrition information were similarly biased, but had higher and more accurate estimations of the calories contained in sandwiches from both restaurants.

Most consumers would like to see nutrition information at places where they go out to eat; however, only limited research has explored how well this information is understood by consumers and which consumers may be most likely to use menu labels in making decisions about what to purchase.²⁹⁻³³

Survey and focus group research of adult restaurant patrons indicates that most consumers are interested in having nutrition information available even if they would not use it at every eating occasion.²⁹⁻³³ The U.S. Food and Drug Administration conducted eight focus groups in four geographically diverse cities to explore the reaction of consumers to having nutrition information on menu boards.³⁰ Focus group participants (n=68), including males and females of diverse educational backgrounds, reacted favorably to the idea of labeling menu items with just calorie information or identifying healthier options with a uniform, commonly defined symbol to help them make better choices.

Although consumers want nutrition information to be available, several other factors, aside from nutrition concerns, influence their menu selections. Most notably, food prices, taste and convenience are frequently reported as important influences on menu selections, and these factors are often at odds with healthy eating.^{29, 30, 32, 38, 52} Some population groups also may be less likely than others to use nutrition information to help them make healthier choices. For example, at least two studies

among college students have found that women are more likely to use nutrition labels than men.^{39, 61} One of these studies, a survey of university dining hall patrons, found that 79 percent of women used the provided nutrition labels compared with only 42 percent of men.³⁹

Surveys of community and college students have found that one-third of respondents do not know how many calories they need to eat per day to maintain their current body weight.^{29, 31} While additional research among other population groups is needed, this research suggests many consumers may have difficulty understanding calorie information in the context of total daily needs. In order to maximize the impact of calorie labeling on restaurant menus, many consumers may need nutrition education in conjunction with point-of-purchase nutrition information.

The results from four national polls further suggest there is broad support for legislation requiring nutrition labeling on restaurant menus; at least 60 percent of the respondents in each poll indicated they would support such a law.⁶² A smaller survey of 79 fast-food patrons similarly found two-thirds of the sample to be supportive and identified the following reasons for supportive and opposing positions.²⁹

- Fast-food patrons who support a menu-labeling law felt it would help consumers to make more informed choices and would encourage businesses to take on greater responsibility for the nutritional quality of foods they serve.²⁹
- Patrons opposed to a menu-labeling law felt that it would place an excessive burden on businesses and that labeling would not be effective in changing people’s decision making.

Providing nutrition information reduces consumers’ intentions to purchase menu items high in calories and fat, especially when there is a greater discrepancy between the perceived and actual nutrition content.^{27, 34-37}

At least six studies have examined the impact of providing menu labeling on adolescents’³⁴ and adults’ intent to purchase foods and beverages.^{27, 35-37, 63} Although the impact of menu labeling varied across demographic groups, five of the six studies showed some evidence that providing nutrition information to patrons for menu items higher in calories or fat results in lower intent to purchase.^{27, 34-37}

For example, one study mailed adult participants (ages 23 to 85) surveys, along with one of three randomly assigned study menus.²⁷ Each menu included four entrée items, plus one of the following (1) information on calories

only; (2) information on calories, fat, saturated/trans fat and sodium; or (3) no nutrition information. The entrées presented on the menu included a deluxe hamburger with fries, chef's salad, chicken breast with baked potato, and a turkey sandwich. Two of the four menu items were higher in calories and fat than consumers expected, and two items were more consistent with consumers' expectations. Participants (n=241, 63% female) were asked to choose just one of the four products and indicate which product they would order on the survey. The results showed:

- For the two entrée items that contained more calories or fats than expected, on average, interest in purchasing the items was significantly lower among those who received the menu with only calorie information (for the deluxe hamburger with fries) or the menu with calorie information plus fat content information (for the deluxe hamburger with fries and chef's salad).
- In contrast, for the two entrée items more consistent with consumers' expectations for calories and fats, interest in purchasing the chicken breast with baked potato or the turkey sandwich remained the same when consumers made selections from menus with calorie information alone or menus with calorie information plus fat content information.

At least one study of adolescents (ages 11 to 18) has examined the impact of menu labeling.³⁴ Adolescent volunteers (n=106) were asked to order a dinner of their choice from three chain restaurants using menus with no nutrition information and then a second time using menus with calorie and fat information. The provision of menus with nutrition information resulted in 29 percent of adolescents modifying at least one of their food orders, and 46 percent of modifications resulted in lower-calorie orders. On average, modifications resulting in lower-calorie orders were reduced by 248 calories at a popular burger-and-fries restaurant and by 218 calories at a quick-service Asian restaurant.

Although some research has found that menu labeling at the point of purchase modestly improves consumers' selection of healthier menu items,³⁸⁻⁵¹ a few studies have shown labeling may lead to higher energy intake among some population subgroups, such as college-age men.^{33, 52} Additional research is needed to understand the potential for menu labeling to have a significant beneficial impact on purchasing patterns among diverse demographic groups.

Different factors likely influence the purchase of food for meals at home versus away from home; however, research regarding consumers' use of the nutrition information printed on packaged foods suggests that providing nutrition information in restaurants and cafeterias may promote healthier menu selections.

- A 2008 national survey found that 63 percent of adult consumers use nutrition labels to select packaged foods.⁶⁴
- At least two studies compared the dietary intakes of consumers who read nutrition labels on packaged foods with the dietary intakes of label non-users and carefully accounted for the characteristics of these two groups being different.^{65, 66} These studies found that consumers who read nutrition labels on packaged foods tend to consume healthier diets (e.g., less total and saturated fat, more fiber and iron) compared with label non-users. For example, one study found label users compared with label non-users had intakes of total fat that were 6.9 percentage points lower, intakes of saturated fat that were 2.1 percentage points lower, and intakes of fiber that were 7.5 grams higher.⁶⁵

Additionally, several studies have examined the impact of providing nutrition information on purchasing behavior among patrons in worksite^{40-43, 67-69} and university cafeterias^{33, 39, 44, 45} and in restaurants.^{28, 38, 46-52, 70} Of these studies, 14 have evaluated labeling only some menu items,^{28, 38, 39, 42, 43, 46-51, 67, 69, 70} and seven evaluated comprehensive labeling.^{33, 40, 41, 44, 45, 52, 68} Only the seven studies evaluating comprehensive labeling are summarized in Table 1, as these studies are of greater relevance to current legislative proposals for mandatory menu labeling.

Researchers have taken a number of different approaches to evaluating the impact of menu labeling on consumer purchases, including listing only calories, listing calories plus other nutrition information and identifying healthier selections (e.g., those lower in fat) with symbols. Some studies have used only menu labeling as a strategy to promote healthier selections whereas others have additionally developed advertising materials,^{28, 48, 50, 51, 69-71} provided educational materials^{38, 44, 49} or provided incentives.^{45, 68}

- While 14 studies reported some improvement in the menu selections made by patrons when labeling is implemented,³⁸⁻⁵¹ six found no evidence of a positive impact.^{28, 52, 67-70}

Table 1. Studies Evaluating Point-of-Purchase Nutrition Labeling for all Items on the Restaurant or Cafeteria Menu

Reference	Setting and Sample	Study Design	Description of Intervention or Conditions	Outcomes Assessed	Summary of Results
Harnack et al, 2008 ⁵²	Study session conference rooms, 594 participants (≥16 years old; 59% female) who reported eating regularly at fast-food restaurants	Factorial (2x2) experiment; study participants were randomly assigned to purchase and consume one evening meal using one of four fast-food restaurant menu designs	Four menu designs: 1) calorie information with value pricing; 2) calorie information and no value pricing; 3) no calorie information and no value pricing; 4) control menu with value pricing and no calorie information	Calorie and nutrient composition of meals that were purchased and consumed	The average calorie and nutrient composition of meals that were ordered and consumed by participants in each menu group were similar. Results indicated a significant impact of labeling among males; however, meals selected and consumed were higher in calories among those who selected their meals from a menu that included calorie content information.
Balfour et al, 1996 ⁴⁰	Workplace restaurants; 694 participants (42% female)	Pre-experimental; Customers were given the opportunity to modify the meal they selected after viewing the nutrient content	Customers were asked to choose their meal using a computerized ordering system. After a customer selected a meal, the computer screen showed the customer the total calorie and nutrient content (saturated fat, added sugars and fiber) of their meal graphically in proportion to dietary reference values.	Percentage of customers that changed their meal selection; calorie and nutrient content of selected meals	Sixteen percent of customers changed their menu selections after viewing nutrient content information. Meal selection changes resulted in lower intake of calories, saturated fat and added sugars.
Aaron et al, 1995 ³³	College cafeterias; 65 students ate lunch in the intervention cafeteria, and 25 students ate lunch in a control cafeteria (38% female)	Quasi-experimental design; one-week baseline, one-week intervention.	Labels with calorie and fat content information in numeric and graphic forms were positioned near all foods in the intervention cafeteria.	Intake of calories and fat	Male intervention participants with little concern for limiting calories increased their intakes of calories and fat during the intervention week relative to control participants.
Mayer et al, 1987 ⁶⁸	Worksite cafeteria serving 265 employees (mean age = 46 years old, 67% female)	Pre-experimental, three phases each lasting four weeks: Baseline 1, Intervention, Baseline 2	Labels with calorie content displayed near all food items on the serving line; a nutrition awareness game; incentive raffles targeting the purchase of healthful foods (e.g., skim milk)	Mean number of calories per tray Purchase rates of targeted healthful foods	The average number of calories per tray was similar in each phase of the study. Purchase rates of targeted foods increased when raffles were introduced and decreased back to baseline levels when raffles were discontinued.

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Table 1. Studies Evaluating Point-of-Purchase Nutrition Labeling for all Items on the Restaurant or Cafeteria Menu

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Reference	Setting and Sample	Study Design	Description of Intervention or Conditions	Outcomes Assessed	Summary of Results
Davis-Chervin et al, 1985 ⁴⁴	Two dormitory cafeterias for undergraduate university students respectively serving 175–200 first-year students and 450–500 students from all four classes per meal	Multiple-baseline, quasi-experimental: five-week baseline period in both dormitories; three five-week intervention periods and three five-week, no-intervention periods in dormitory 1; one five-week intervention period and one five-week, no-intervention period in dormitory 2	Dormitory 1: educational posters and cards displaying nutrition information (calories, percentage of calories from fat, mg of cholesterol) for all entrees and selected ancillary menu items (e.g., milk) Dormitory 2: cards displaying nutrition information (calories, percentage of calories from fat, mg of cholesterol) for all entrees and selected ancillary items	Proportion of low-cholesterol, low-fat, or low-calorie entrees selected at each meal	The percentages of students selecting low-cholesterol, low-fat, and low-calorie items were higher than baseline during each intervention period and the final no-intervention period in dormitory 1. The percentages of students selecting low-cholesterol, low-fat, and low-calorie items did not improve relative to baseline in dormitory 2.
Cinciripini, 1984 ⁴⁵	University cafeteria serving primarily undergraduate students (ages 18 to 23; approximately 50% female)	Quasi-experimental, seven phases, each lasting eight to nine weeks: Baseline 1, Caloric feedback intervention, Baseline 2, Labeling intervention, Baseline 3, Token intervention, Baseline 4	Caloric feedback: large signs at each entrance with calorie content information for all menu items; leaflets distributed to draw attention to signs Labeling: identification of nutrient-dense, low-fat, low-calorie foods with a green triangle on menu boards and serving lines by the actual food; signs listing green triangle foods at cafeteria entrances; leaflets distributed regarding the nutritional benefits of green triangle foods Token: cash rebate awarded following purchase of 10 green triangle foods; signs at cafeteria entrances listing green triangle foods and announcing program; leaflets distributed to explain the program	Percentage of customers who chose at least one food in a particular food group during a phase	Caloric feedback was associated with the greatest reductions in consumption from the red meat and carbohydrate food groups, while token procedures produced the greatest increases in consumption from the vegetable/soup/fruit/low-fat dairy, chicken/fish/turkey, and salad groups, and a decrease in high fat/dessert/sauces group intake. The extent of effects depended on gender and weight status. The labeling intervention did not produce uniform changes in food choice behavior across gender and weight status groups.
Milich et al, 1976 ⁴¹	Hospital cafeteria; 450 normal, overweight and obese female employees	Pre-experimental; two-week baseline period, one-week price increase intervention, and one-week labeling intervention	Price increase: Prices were raised by 5–10 cents on approximately half of all food items; employees notified by signs of price increases Labeling: All food items were labeled with calorie content information on the serving line	Calories purchased at lunch	No significant difference was observed in the average number of calories purchased between the baseline and price increase conditions, but there was a significant decrease from the price increase to the calorie presentation condition. All three weight groups showed a consistent decrease in calories purchased during the calorie presentation condition.

- Results of the seven studies that evaluated comprehensive labeling also were mixed (Table 1). Four of the seven studies support the view that providing point-of-purchase nutrition information in a restaurant or cafeteria setting may result in the selection of healthier meals.^{40, 41, 44, 45} In contrast, three of the studies either found no evidence of an impact on food choices or found that nutrition information was used by some groups (e.g., men and those with little concern for limiting calories) to select a higher-calorie meal.^{33, 52, 68}
- The unexpected impact of menu labeling on food choices in some groups of men and those with low concern about limiting calories might be explained by the findings of a survey among college students. Results of the survey indicated that women were more likely than men to use nutrition information in order to help them lose weight, whereas men were more likely to use labels to help them gain weight.⁷²
- Drawing conclusions regarding the benefits of labeling and possible unintended consequences from this research is difficult, as most studies had at least one major shortcoming in design (e.g., lack of random assignment). Also, several studies introduced multiple strategies to promote healthy eating at the same time that labeling was implemented.

Only one experimental study randomly assigned participants to different menu labeling conditions.⁵² A total of 594 participants (>16 years old, 59% females) were invited to a single study session and asked to purchase and consume one fast-food restaurant meal for dinner. Participants were randomly assigned to place their order using one of four menu designs:

1. calorie information for all items and value pricing (per unit cost decreases as portion size increases);
 2. calorie information and no value pricing;
 3. no calorie information and no value pricing; and
 4. control menu with value pricing and no calorie information.
- The overall results showed the average energy and nutrient composition of meals ordered and consumed by those in each menu group were similar.
 - However, it appeared that male participants used calorie information on menus to choose a meal higher in calories. The average energy content of meals ordered by men was higher in all three groups of males who received modified menus compared with the group that received the control menu, with value pricing and no calorie information.

Requiring restaurants to provide point-of-purchase nutrition information could help reduce obesity by promoting the introduction of healthier menu options.⁵³ The field currently lacks research that evaluates the impact of menu labeling regulations on changes in the nutritional quality of menu options.

When mandatory nutrition labeling for packaged foods was first implemented, between 1991 and 1995, the number of available fat-modified cheese products tripled, and the market share for fat-modified cookies increased from 0 percent to 15 percent.⁵³ It is possible that requiring away-from-home food establishments to provide nutrient content information will similarly encourage the introduction of more healthful options and the reformulation of existing menu items to reduce their fat and calorie content. The reformulation of menu items to be more healthful may benefit all consumers, including those who may not choose to modify their order based on the presence of nutrition information. Research evaluating this potential benefit of menu labeling is lacking.

In the past, the restaurant industry raised several potential obstacles to providing point-of-purchase nutrition information.^{54, 55} At this time, it is unclear whether these perceived obstacles would impede the implementation of proposed menu labeling requirements or reduce restaurant revenues.

If proposed mandatory labeling requirements are implemented, there are several potential obstacles to providing point-of-purchase nutrition information that may require attention to promote compliance (see Table 2).^{54, 73}

If point-of-purchase menu labeling leads consumers to reduce their spending at away-from-home food establishments, revenues might decrease, especially in establishments that offer mostly high-calorie menu items. However, the willingness of consumers to spend money at away-from-home food establishments is largely determined by having expendable income and the perceived value of away-from-home food in terms of convenience and taste.^{29, 30, 32, 38, 52} It is possible that revenues will simply shift within and between away-from-home food establishments if menu labeling influences what consumers decide to purchase.⁵⁵ Researchers have not found evidence to indicate that menu labeling will reduce the revenues of away-from-home food establishments; however, few studies have evaluated the impact of labeling on spending patterns.^{34, 41}

Table 2. Potential Obstacles to Implementing Menu Labeling in Away-From-Home Food Establishments

1.	Chefs are taught to cook by proportion, touch, taste and feel rather than by following standardized recipes. Restaurants and cafeterias that do not use standardized recipes or allow for the customization of orders may unintentionally provide inaccurate information to consumers.
2.	Providing nutrition information would limit flexibility in changing the menu.
3.	Providing nutrition information would be too difficult when there are many menu variations and little space on the menu.
4.	Providing nutrition information might be costly.
5.	Providing nutrition information might lead to reduced demand for profitable menu items or encourage consumers to switch the source of their meals from one food-service outlet to another.
6.	Training employees to respond to questions about menu labeling may be difficult.

Conclusions & Implications

Americans spend nearly half of their food budget eating out or on away-from-home foods. These meals tend to be more calorie-dense and of poorer nutritional quality than foods and beverages consumed at home. The majority of restaurants do not provide nutrition information at the point of purchase, and most consumers underestimate the number of calories and fat in away-from-home foods. Although several studies have found that providing nutrition information at the point of purchase leads to modest increases in the selection of healthier menu items, additional research is needed to determine whether mandatory labeling requirements would have a meaningful and beneficial impact on consumers' purchasing decisions. Menu labeling requirements also may encourage the restaurant industry to introduce new healthful menu options and reformulate existing products to reduce their calorie or fat content, which could lead to dietary improvements for all restaurant patrons, not just those who notice and use nutrition information.

Areas Where Additional Research Is Needed

- Policy evaluation studies should be conducted to examine the nutritional and economic impacts of newly introduced regulations requiring menu labeling in away-from-home food establishments. In particular, the impact of regulations on changes in the nutritional

quality of menu offerings should be evaluated so that the full potential benefit of this public health approach to obesity prevention may be considered.

- Additional experimental studies using random assignment in restaurant settings also are needed to evaluate the impact of menu labeling on individual purchasing behavior. Although several studies have examined the impact of menu labeling on self-reported purchase intentions, this outcome is particularly subject to social desirability bias as respondents are not required to taste or pay for their order.
- Future experiments should evaluate whether repeated exposure to menu labeling, nutrition education or incentives are necessary before the majority of patrons will become aware of the information provided and consider changing their purchasing behavior as a result.
- Studies should identify how and where menu labeling needs to be presented to most effectively help restaurant and cafeteria patrons make healthier choices and lower their caloric intake. Prior research has evaluated a number of different labeling formats; however, few studies have directly compared various formats within one setting. Research in different naturalistic settings will be necessary given that several varied layouts are used in different types of restaurants and cafeterias. Also, the importance of nutrition to patrons may vary according to the nature of eating occasions (e.g., eating lunch alone in one's workplace cafeteria compared with having dinner with friends at a sit-down restaurant).
- Researchers should investigate which characteristics of patrons (e.g., age, gender, weight concerns and nutrition attitudes) impact whether or not menu labeling is utilized when ordering away-from-home foods. As most studies evaluating the impact of menu labeling have focused on adults, future studies should include children and adolescents.
- American families have undergone profound social changes over the past 40 years—family structures have changed, and more women have entered the workforce. Because of the pressures created by busy schedules, many parents are more reliant on eating out. Menu labeling may help parents purchase healthier foods and portion sizes for their children. Studies have shown that households with children are more likely to use nutrition information.⁷⁴ Studies are needed to examine whether menu labeling impacts which menu items parents order for their children.

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