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Making Healthful Food Choices: The Influence of Health Claims and Nutrition Information on Consumers’ Evaluations of Packaged Food Products and Restaurant Menu Items

The authors report the results of three experiments that address the effects of health claims and nutrition information placed on restaurant menus and packaged food labels. The results indicate that when favorable nutrition information or health claims are presented, consumers have more favorable attitudes toward the product, nutrition attitudes, and purchase intentions, and they perceive risks of heart disease and stroke to be lower. The nutritional context in which a restaurant menu item is presented moderates the effects of both nutrition information and a health claim on consumer evaluations, which suggests that alternative (i.e., nontarget) menu items serve as a frame of reference against which the target menu item is evaluated.

Americans have been gaining weight in recent years, and there is significant long-term disease risk associated with this trend. The Nutritional Labeling and Education Act of 1990 (NLEA) was expected to help curtail this trend by providing information to assist consumers in making more healthful food choices. Yet today, more than 50% of U.S. adults are overweight, and 12% of school-aged children are obese, twice the number reported 20 years ago (Liebman and Scharid 2001; Spake 2002). It is estimated that in the United States, more than 300,000 deaths per year (14% of all deaths) are directly related to conditions and diseases associated with being overweight and obese (Centers for Disease Control and Prevention 2002).

The NLEA increased the availability and usefulness of nutrition information on food packages. This was expected to have long-term positive effects on Americans' diets and reduce their risk for heart disease and some types of cancer. The Nutrition Facts panel, mandated on most food packages since 1994, is a widely recognized outcome of the NLEA. Distinctive and easy to read, the Nutrition Facts panel presents information on the amount per serving of saturated fat, cholesterol, dietary fiber, and other major nutrients and provides nutrient reference values expressed as “% Daily Values” (DV). The NLEA also established criteria by which nutrient and health claims can be made on food packaging. Although health claims have been used on package labels since 1984, they have been criticized as vague, trivial, or misleading (Silverglade 1996).

However, not all foods are covered by all aspects of the NLEA. Among the excluded foods are those sold for immediate consumption, such as in restaurants, on airplanes, and from vending machines (Saltos, Welsh, and Davis 1994). Food sold and served in restaurants is an especially important exception. According to the National Restaurant Association, Americans spent 45% of their food dollars outside the home in 1997, up from 25% in 1955. In 1998, 46% of all adults were restaurant patrons on a typical day. Furthermore, 21% of U.S. households used some type of restaurant takeout or delivery on an average day (National Restaurant Association 2001). Because restaurants are not required to present nutrition information about the food items on their menus, the availability and form of presentation of nutrition information varies. Many restaurants do not make information regarding the nutritional content of their food readily available to consumers. In other restaurants, nutrition information is presented on the menu, placed on a sign, or provided in a brochure. There is somewhat greater consistency across restaurants regarding the nature of specific health claims since the Food and Drug Administration (FDA) ruled in 1997 that health claims made for food served in restaurants must be consistent with the claim definitions established under the NLEA. However, unlike processed foods, menu items with a health claim are not held to strict standards of laboratory analyses.

Research Objectives

Considerable marketing and public policy research has focused on the effects of changes, such as the use of nutrition information and health claims, brought about by the
The FDA currently allows health and nutrient claims on both food package labels and restaurant menus. The substantial number of nutrient and health claims appearing on both restaurant menus and packaged food labels highlights the importance of understanding how consumers use health claims, in conjunction with nutrition information, to form product evaluations. Thus, we consider several additional questions. Does the provision of a health claim moderate the effects of nutrition information on product evaluations? How does the nutritional context, that is, the nutritional frame created by other menu items, influence evaluations of a target menu item? Similarly, does the nutritional context in which a specific menu item is presented moderate the influence of a health claim on the influence of nutrition information on target product evaluations? We use three general types of dependent measures to address these questions. First, we consider product evaluations, including attitude toward the product, purchase intention, and nutrition attitude. Second, we examine perceptions of source credibility. Third, we focus on consumers' assessments of the likelihood of developing specific diseases (i.e., heart disease and stroke) if the food is regularly included in their diet.

In the remainder of the article, we discuss the FDA’s standards regarding the use of health claims. Next, we offer the theoretical foundation and hypotheses. Then, we describe our three studies, present their results, and discuss the theoretical, managerial, and public policy implications of the findings.

Theoretical Rationale

The FDA currently allows health and nutrient claims on both food package labels and restaurant menus. “Low fat” or “high fiber” are specific claims that pertain to a food’s nutrient content. Health claims address the relationship between a specific nutrient and a disease or health condition. For example, the packaging of foods with low levels of saturated fat and cholesterol may state, “Diets low in saturated fat and cholesterol may reduce the risk of heart disease.” On packaged food products, Nutrition Facts information can verify such claims. However, claims made about food items on restaurant menus are more difficult to verify because supporting nutrition information is available only on request. Claims that emphasize “heart healthiness” might have an accompanying symbol, such as a large red heart on the front of the package or next to the menu item.

To make a heart-healthy claim, one of two conditions must be satisfied (Kurtzweil 1998). The first condition is that the item is low in saturated fat, cholesterol, and fat. This claim can indicate that a diet low in saturated fat and cholesterol may reduce the risk of heart disease. The second condition is that the item is a significant source of soluble fiber (found in fruits, vegetables, and grains); is low in saturated fat, cholesterol, and fat; and provides without fortification significant amounts of one or more of six key nutrients. In addition, to make a heart disease claim, the food must contain less than the disqualifying amount of sodium.

Hypotheses

We suggest that consumers’ evaluations of a food item are more favorable when a health claim is presented than when no claim is made. This expectation is consistent with prior research showing that consumers had more favorable ratings of the healthiness of a product and higher purchase intentions after they were exposed to a general statement claiming that the product was “healthy” (Andrews, Netemeyer, and Burton 1998; Roe, Levy, and Derby 1999). Similarly, we expect a main effect of nutrition information on consumers’ product evaluations and purchase intentions. Favorable nutrition information should result in more favorable product evaluations and higher purchase intentions for both a pack-
aged food product and a restaurant menu item, which would confirm and extend the findings of previous research (Garrettson and Burton 2000; Keller et al. 1997).

Roe, Levy, and Derby (1999) find that consumers considered a product to be healthier when health and nutrient claims were presented. If nutrition information and a health claim influence evaluations of nutritional value, the perceived risk of disease associated with the consumption of that food is also likely to be affected. We presented consumers in this study with a “heart-healthy” claim that identified the relationship between the consumption of saturated fat and cholesterol and the likelihood of coronary heart disease, but not a specific nutrient claim. From this health claim, we expect a main effect on perceptions of disease risk, particularly stroke and heart disease. The health claim should decrease the perceived likelihood of disease if the food is included as a regular part of the consumer’s diet. The availability of favorable nutrition information should be associated with the same general pattern of results, though effects on disease risk should be more modest because of the lack of specific disease information.

However, we suggest that such main effects are qualified by significant interactions. Previous research indicates that prior expectations influence subsequent information processing when the subsequent information is ambiguous (e.g., Lord, Ross, and Lepper 1979). A health claim presented on the front panel of the package is typically encountered before nutrition information, which is usually presented on the back or side panel, is processed. Specific expectations created by a health claim may bias the processing of information presented by the Nutrition Facts panel. Thus, we expect disease risk evaluations to be lower when favorable nutrition information is accompanied by a health claim than when no claim is present. However, for nutrition and product evaluations, the claim should not have a positive effect beyond the relevant and specific favorable nutrition information in the panel. When no nutrition information is available, there is no specific information that may be used to test consumers’ expectations about the product created by the claim. With only ambiguous information (e.g., a product picture) available to address expectations formed by exposure to the claim, the effect of the claim on product evaluations and disease risk perceptions should be favorable compared with the no-claim condition.

How will consumers respond if the health claim is not consistent with the nutrition information presented on the Nutrition Facts panel? In general, consumers tend to be somewhat more suspicious of health and nutrient claims; the Nutrition Facts panel is often used to verify such claims (Levy 1995). This suggests that when a health claim contradicts information on the Nutrition Facts panel, the perceived credibility of the manufacturer will be diminished and consumer evaluations will be unfavorably affected. On the basis of this discussion, we posit the following hypotheses:

**H1:** A heart-healthy claim has a favorable influence on consumer evaluations (attitude toward the product, nutrition attitude, and purchase intention) and reduces consumers’ perceptions of the risk of heart disease and stroke.

**H2:** There is a positive (negative) effect of favorable (unfavorable) nutrition information on consumer evaluations, and positive nutrition information reduces consumers’ perceptions of the risk of heart disease and stroke.

**H3:** These dependent measures are influenced by an interaction between a health claim and the provision of nutrition information. When nutrition information is not provided, inclusion of a health claim has a positive effect on evaluations and reduces disease risk perceptions. When favorable nutrition information is presented, inclusion of a health claim has no effect on evaluations but reduces disease risk perceptions. When unfavorable nutrition information is presented, inclusion of a health claim has a negative effect on evaluations and no effect on disease risk perceptions.

**H4:** Perceived source credibility is influenced by an interaction between a health claim and the provision of nutrition information. Perceived source credibility is lowest when the information presented is contradictory, that is, when a health claim is provided but the nutrition information is unfavorable.

Are consumers’ evaluations of a specific menu item influenced by the healthiness of the other items on the menu? For example, will consumers’ evaluations of a lean, eight-ounce sirloin steak differ depending on whether it is presented on a “steakhouse” menu (containing many high fat, high cholesterol items) or on a more “vegetarian” menu (containing many low fat items)? Prior research has demonstrated the important role played by reference points during many consumer choice and judgment processes (Dhar, Nowlis, and Sherman 1999; Dhar and Simonson 1992). We suggest that nutrition information presented for the other menu items will serve as a reference point against which the target item is evaluated and thus moderate the effects of both nutrition information and a health claim on the dependent measures.

In the absence of nutrition information for nontarget menu items, favorable (unfavorable) nutrition information is expected to have a positive (negative) effect on consumer evaluations and the perceived likelihood of disease. Compared with the unhealthy nutritional context, in a healthy context, the provision of favorable nutrition information for the target item should have a less positive influence than on consumer evaluations and risk perceptions. Similarly, in the unhealthy nutritional context, the provision of negative nutrition information should have a less negative effect on consumer evaluations and disease risk perceptions than in the healthy context. However, in the unhealthy nutritional context, the provision of favorable nutrition information should have a positive effect on consumer evaluations and reduce the perceived risk of disease. In addition, because consumers are somewhat more suspicious of health claims than of nutrient information presented in Nutrition Facts panels (Levy 1995), when a nutritional context is not provided, the inclusion of a health claim will have a stronger (more positive) effect on evaluations and perceived risk of disease than when a nutritional context is provided. We constructed the stimuli so that in the healthy nutritional context, the target item had slightly higher levels of total fat, saturated fat, cholesterol, and sodium than the other two nontarget items. Thus, the provision of a health claim in the healthy nutritional context should decrease perceived source credibility. On the basis of this discussion, we propose the following hypotheses:

**H5:** When the nutritional content of alternative menu items is unhealthy, consumers’ evaluations of the target product are more favorable and their perceptions of disease risk are
lower than when the nutritional content of alternative menu items is healthy.

H6: When the nutritional context created by alternative menu items is healthy, favorable nutrition information has a less positive effect on evaluations and risk perceptions than when the nutritional context is unhealthy. Similarly, when the nutritional context is unhealthy, unfavorable nutrition information has a less negative effect on evaluations and risk perceptions than when the nutritional context is healthy.

H7: The nutritional context in which a food is evaluated moderates health claim effects on consumer evaluations and disease risk perceptions. When the nutritional content of alternative menu items is not provided, inclusion of a health claim has a stronger (more positive) effect on evaluations and perceived risk of disease than when the nutritional context is provided.

H8: The nutritional context in which a food is evaluated moderates the effect of a health claim on perceived source credibility. When the nutritional context is healthy, the provision of a health claim reduces source credibility more than when the context is unhealthy or when no context is provided.

Studies 1 and 2

Method

Pretests. The first pretest assessed nutrient levels considered for use in the first two experiments. Two Nutrition Facts panels were developed from two frozen lasagna dinner products found in local supermarkets. On the basis of these products, the two panel stimuli had different levels of fat (18 grams and 2.5 grams), saturated fat (10 grams and 1 gram), and cholesterol (50 milligrams and 10 milligrams). Other nutrient levels were identical across the stimuli (e.g., 360 milligrams of sodium). Forty respondents, presented with one of the Nutrition Facts panels, evaluated the overall product nutrition level and nutrient levels. Significant differences (t-values from 2.53 to 5.18, p < .01) occurred between the two Nutrition Facts panels for overall nutrition level and for each individual nutrient. These findings suggest that these nutrient levels are appropriate for the nutrition manipulation in Studies 1 and 2.

The second pretest examined issues related to the provision of nutrition information on the Study 2 menu stimuli. Three nutrition conditions were assessed: the favorable and unfavorable conditions from the first pretest and a control condition with no nutrition information. Results for nutrition perceptions and nutrient evaluations were again significant (Wilks’ lambda = .53, F = 4.3, p < .05), and means were in the desired direction. Reliabilities of multi-item measures were all satisfactory. According to discussions with respondents, there were no problems with the realism of the menu stimuli or hypothesis guessing.

Design, procedures, and study participants. Because Studies 1 and 2 differed in only one important respect, we discuss their design, procedures, and participants concurrently. Whereas a packaged food product (a microwaveable, frozen lasagna dinner) was the focus of Study 1, Study 2 focused on a restaurant menu item (a lasagna entrée). The menu and package were constructed to be similar in design. The picture of the product was identical, the same (fictional) brand name (“Blue Ribbon”) was used on the package and the restaurant menu, the lasagna serving was the same size (255 grams), and the description of the product was invariant. To increase the comparability of the findings of Studies 1 and 2, only the target item (presented as the feature of the day) was presented on the menu. We used a 2 (inclusion or exclusion of a heart-healthy claim) x 3 (nutrition information level with control [no information], unfavorable, or favorable conditions) between-subjects design in both Studies 1 and 2. In the heart-healthy claim conditions, a heart-shaped symbol identified the target food as a heart-healthy selection and included a footnoted health claim consistent with FDA-permitted claims regarding the relationship between saturated fat and cholesterol and the risk of coronary heart disease. The footnoted claim, presented on the front of the package and at the bottom of the menu, stated, “A diet low in saturated fat and cholesterol may reduce the risk of coronary heart disease.” In the no-claim condition, the heart-healthy claim information was omitted.

According to the results from the pretest, favorable and unfavorable nutrition conditions differed in nutrient levels on the Nutrition Facts panel for fat, saturated fat, cholesterol, and calories from fat. Nutrient levels of sodium, carbohydrates, fiber, protein, and vitamins and minerals were held constant across conditions. In the favorable nutrition value condition, use of the heart-healthy claim is consistent with FDA requirements for levels of saturated fat and cholesterol. This claim is not consistent with the requirements in the unfavorable nutrition condition.

Participants were members of a consumer household research panel for a southern U.S. state and were screened for primary food shopper status. Panel members were mailed packets with stimuli for either Study 1 or Study 2, a survey that included questions of general interest, and a stamped self-return envelope. The combined response rate for the studies was approximately 48%; 147 usable surveys were returned for Study 1, and 145 usable surveys were received for Study 2. Participants ranged in age from 21 to 87 years, and 74% were women. The number of times meals had been purchased at restaurants in the past month ranged from 0 to 63.

Dependent measures. Most dependent measures were assessed with seven-point scales, and all scales were recoded when necessary so that higher values indicated more positive responses. All multi-item measures were divided by the number of scale items, and these mean scores were used in analyses. Items used to measure attitude toward the brand, purchase intentions, nutrition attitude, and source credibility appear in the Appendix. Across the two studies, all coefficient αs exceeded .80. To assess disease risk perceptions, participants considered whether the food product, if eaten regularly as part of their

2For a heart disease claim, the product must contain 3 grams of fat or less and 1 gram of saturated fat or less per 100 grams of food content. However, similar claims on menus have not always met this standard. For example, some restaurants have placed a Fit Fare symbol (a heart with the words “fit fare”) next to menu items that contain almost 15 grams of fat.
diet, would decrease or increase their likelihood of developing heart disease and having a stroke. These disease risk items were single-item measures employing a nine-point scale.

Results

Multivariate and univariate results for effects of the health claim and nutrition information manipulations on consumer evaluation and disease risk perceptions appear in Table 1; cell means are in Table 2. The top portions of the tables contain information pertaining to Study 1 (the packaged food product), and the bottom portions of the tables contain information pertaining to Study 2 (the restaurant menu item). We discuss the findings from Studies 1 and 2 separately to facilitate comparisons to prior research and between the different contexts (i.e., package versus menu).3

Findings from Study 1. Multivariate effects of the health claim (Wilks' lambda = .90, F = 2.57, p < .05) and nutrition information (Wilks' lambda = .82, F = 2.40, p < .01) are significant. The two-way interaction between the health claim and nutrition information is not significant (Wilks' lambda = .95, F < 1). Follow-up univariate analyses reveal that the provision of a heart-healthy claim has a favorable influence on nutrition attitude (F(1, 140) = 10.09, p < .01). The health claim also reduces the perceived risk of heart disease (F(1, 140) = 8.03, p < .01) and stroke (F(1, 140) = 7.41, p < .01). These findings offer partial support for H1.

In H2, we hypothesized that favorable nutrition information would positively affect consumer evaluations and reduce the perceived risk of disease. Consistent with this pattern of predictions, the univariate results show a significant main effect of nutrition information on attitude toward the product (F(2, 140) = 3.82, p < .05), nutrition attitude (F(2, 140) = 9.90, p < .01), and purchase intentions (F(2, 140) = 6.45, p < .01). In addition, favorable nutrition information reduces consumers' perceptions of the risk of stroke (F(2, 140) = 3.14, p < .05) and heart disease (F(2, 140) = 3.76, p < .05), as was predicted. Contrary to the expectations presented in H3 and H4, the health claim does not interact with nutrition information to influence consumer evaluations (F(2, 140) < 1 for all measures) or perceived credibility (F(2, 140) = 2.02, p > .10).

Findings from Study 2. Study 2's results focus on the restaurant menu item. As we predicted, there is a multivariate main effect of the health claim (Wilks' lambda = .78, F = 6.28, p < .001). The provision of a health claim reduces the perceived likelihood of both heart disease (F(1, 142) = 10.62, p < .001) and stroke (F(1, 142) = 9.41, p < .01). However, the provision of a health claim does not influence attitudes toward the product (F(1, 142) < 1), nutrition attitude (F(1, 142) = 2.42, p > .10), or purchase intentions (F(1, 142) = 1.06, p > .10). H1 is therefore only partially supported.

We also predicted a positive (negative) effect of favorable (unfavorable) nutrition information on the dependent measures. Consistent with the pattern of predictions, there is a significant multivariate main effect of nutrition information (Wilks' lambda = .62, F = 6.27, p < .001). As we predicted in H2, favorable (unfavorable) nutrition information has a positive (negative) effect on attitude toward the product (F(2, 142) = 14.85, p < .001), nutrition attitude (F(2, 142) = 33.28, p < .001), and purchase intention (F(2, 142) = 16.25, p < .001). Favorable (unfavorable) nutrition information also reduces (increases) the perceived risk of heart disease (F(2, 142) = 19.61, p < .001) and stroke (F(2, 142) = 15.86, p < .001).

A significant interaction between the provision of nutrition information and a health claim, according to H3, should influence consumer evaluations and perceived risk of disease. The results of a multivariate analysis of variance confirm this expectation (Wilks' lambda = .83, F = 2.27, p < .05). Univariate results are significant for nutrition attitude (F(2, 142) = 4.42, p < .01), purchase intention (F(2, 142) = 3.51, p < .05), perceived likelihood of stroke (F(2, 142) = 7.13, p < .001), and perceived risk of heart disease (F(1, 142) = 6.37, p < .01) and are marginally significant for attitude toward the product (F(2, 142) = 2.86, p < .10). Plots for significant interactions appear in Figure 1.

Follow-up analyses provide further insight into the significant interactions. When no nutrition information is available on the menu, there is a significant multivariate main effect of the heart-healthy claim (Wilks' lambda = .67, F = 3.02, p < .05) on the dependent measures. Univariate results show that the claim positively influences both purchase intentions and nutrition attitude (t = 2.46 and 2.67, respectively, p < .01) and reduces the perceived likelihood of disease risk for heart disease and stroke (t = −3.07 and −3.45, respectively, p < .01). In the favorable nutrition condition (when the health claim provides information that is consistent with nutrition information), the multivariate effect of the claim is also significant (Wilks' lambda = .61, F = 4.94, p < .001). As we predicted, the health claim lowers the perceived likelihood of both heart disease (t = −3.33, p < .01) and stroke (t = −3.37, p < .01), but nutrition attitude and purchase intentions are not affected by the claim when there is favorable nutrition information. Thus, when the nutrition information is positive, the heart-healthy claim adds information that affects disease risk perceptions but not general evaluations. In the unfavorable nutrition condition, neither the multivariate nor the univariate effects of a health claim achieve significance, which indicates that the claim does not have any positive effect when the nutrition information is not favorable. In summary, the interaction effect proposed in H3 is partially supported.

H4 suggests that the effect of a heart-healthy claim on perceived credibility is moderated by the provision of nutrition information. The univariate results provide strong support for this prediction (F(2, 142) = 5.84, p < .01). The relevant plot for the test of H4 is in Figure 2, Panel A. In the favorable nutrition condition and when no nutrition information is presented, the health claim does not influence perceptions of source credibility (t < 1). As shown in Figure 2, Panel A, in these conditions, credibility perceptions are similar regardless of whether the claim is present. However, in the unfavorable nutrition condition (i.e., when the nutrition information does not support the heart-healthy claim), the

3 We thank an anonymous reviewer for this suggestion.
<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Manova Results</th>
<th>Univariate F Values</th>
<th>Disease Risk Measures</th>
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<td></td>
<td>Wilks' λ</td>
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<td>Nutrition information (NI)</td>
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<td>HC × NI</td>
<td>.83</td>
<td>2.27**</td>
<td>2.86*</td>
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*p < .10.
"*p < .05.
""p < .01.
"'''p < .001.
TABLE 2
Dependent Variable Means for Studies 1 and 2

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Consumer Evaluation Measures&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Disease Risk Measures&lt;sup&gt;b&lt;/sup&gt;</th>
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<td>Claim present</td>
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<sup>a</sup>These measures are based on seven-point scales; higher scores indicate more favorable evaluations.

<sup>b</sup>A nine-point scale is used for each of these measures; higher scores indicate a greater perceived risk of disease.

health claim has a negative influence on perceived source credibility (t = -3.69, p < .01). Credibility is significantly lower when the (inaccurate) health claim is available compared with when no claim is presented (M = 3.32 versus 4.92).

**Discussion**

The findings show that when a heart-healthy claim is on the package or menu, consumers generally judge the product to reduce the likelihood of heart disease or stroke, but favorable nutrition information leads to more positive attitudes toward the product, nutrition, and purchase intentions, in addition to the belief that the product reduces disease risk. Effects of nutrition information relative to the claim manipulation are particularly strong for the restaurant menu context.

Consistent with prior research examining health claims and nutrition information on packages (e.g., Ford et al. 1996; Garretson and Burton 2000), nutrition information did not interact with the effect of the claim in the package environment. However, the interaction between the health claim and nutrition information was significant in the context of a restaurant menu, which further highlights the usefulness of providing nutrition information to help consumers make healthy food choices when dining out. When favorable nutrition information was presented, the use of a heart-healthy claim further decreased the perceived likelihood of stroke and heart disease.

This pattern of findings contrasts with that of the product attitude and purchase intentions variables, for which the claim has no influence when the nutrition information is favorable. For disease risk, the heart-healthy claim probably serves as incremental, useful information that influences disease risk perceptions, but it does not add information that affects attitudes and intentions beyond the favorable effects of the Nutrition Facts information. When no Nutrition Facts information is presented, however, the claim is the only cue available, and it affects attitudes, purchase intentions, and disease risk perceptions. When unfavorable nutrition information is available, the heart-healthy claim has no influence on either the evaluations or disease risk perceptions. This overall pattern of results suggests that consumers may be somewhat wary of health claims and prefer instead to trust information contained on the Nutrition Facts panel when it is available. This pattern of results also suggests that consumers in general are fairly sophisticated in their ability to use information provided by the Nutrition Facts panel to formulate appropriate conclusions.

This study suggests that though some findings from prior research on labeling may apply to restaurant foods, unfavorable nutrition information does not have equivalent effects when presented in different consumption contexts. Although the positive effects of favorable nutrition information appear similar for food products in both packaged goods and restaurant contexts, the negative effects of unfavorable information are stronger for a menu item than for a packaged good. Furthermore, the provision of nutrition...
information for a menu item generally has stronger effects than nutrition information presented on a packaged food product. This implies that many consumers do not realize the unhealthiness of many foods prepared outside the home.

In consideration of these findings, the purpose of Study 3 was to provide additional insight into the effects of a health claim and nutrition information on consumers' evaluations of restaurant menu items. There are several key differences between our first two studies and Study 3. Rather than presenting a Nutrition Facts panel on the menu, we presented nutrient information immediately after the item’s description. This format is a more practical and commonly used way to present nutrition information on a menu. In addition, three menu items, rather than just a single entrée, were presented. Finally, the nutritional context, that is, the nutrient levels of the other food items on the menu, was varied as a third factor.

**Study 3**

**Design, Procedures, and Study Participants**

Study 3 was a between-subjects experiment that used a 2 (inclusion or exclusion of a heart-healthy claim) × 3 (nutrition information level with control, unfavorable, or favorable conditions) × 3 (nutritional context, or the nutrient levels of the nontarget menu items, with control, healthy, and unhealthy conditions) design. The stimuli identified the target menu item as a heart-healthy selection in the heart-healthy claim condition and included a footnoted health claim consistent with FDA-permitted claims regarding the relationship between saturated fat and cholesterol and the risk of coronary heart disease.

There were three items on the menu: Slow-Roasted Chicken, Chicken Marsala, and Grilled Chicken Fajitas. To avoid introducing bias into the experiment because of co-
FIGURE 2
Effects of a Health Claim and Nutrition Information on Perceived Source Credibility

A. Study 2: Health Claim x Nutrition Information

![Chart showing the effects of health claim and nutrition information on perceived source credibility.]

B. Study 3: Health Claim x Nutritional Context

![Chart showing the effects of health claim and nutritional context on perceived source credibility.]

consumers' food perceptions and preferences, the target item was counterbalanced across conditions; each item served as the target item for one-third of the subjects, and the order of the menu items was rotated. In the unfavorable nutrition information condition, the target item always contained 35 grams (54% DV) total fat, 11 grams (55% DV) saturated fat, 180 milligrams (60% DV) cholesterol, and 1400 milligrams (58% DV) sodium. In the favorable condition, the target item contained 10 grams (15% DV) total fat, 3 grams (15% DV) saturated fat, 40 milligrams (13% DV) cholesterol, and 600 milligrams (25% DV) sodium. The nutrition levels of the two alternative menu items were also counterbalanced across subjects in both the favorable and the unfavorable nutritional contexts. In the healthy context, nutrient values of the two nontarget items were slightly more positive than

the nutrient levels for the favorable target item condition. In the unhealthy context, nutrient values of the alternative items were slightly more negative than the nutrient levels for the unfavorable target item condition. In the healthy context, nutrient values of the two nontarget items were 6 grams and 8 grams (9% and 12% DV) total fat, 2 grams and 2.5 grams (10% and 13% DV) saturated fat, 30 milligrams and 35 milligrams (10% and 12% DV) cholesterol, and 570 milligrams and 560 milligrams (24% and 23% DV) sodium. In the unhealthy context, nutrient values of the two non-target items were 40 grams and 50 grams (62% and 77% DV) total fat, 13 grams and 18 grams (65% and 90% DV) saturated fat, 190 milligrams and 220 milligrams (63% and 73% DV) cholesterol, and 1750 milligrams and 2000 milligrams (73% and 83% DV) sodium. The actual nutrition levels for the menu items were most similar to the unfavorable nutrition levels, according to information compiled by the Center for Science in the Public Interest (1997), which analyzed the nutritional content of menu items from various fast-food and dinner house restaurants.

Study participants were recruited at a local mall. Interviewers set up a table in the mall with a sign stating "Consumer Research Study." Shoppers who agreed to participate received $1. A total of 364 shoppers, equally divided in terms of sex, participated in the study, and they ranged in age from 18 to 82 years. Participants were randomly assigned to 1 of the 18 conditions, handed a booklet containing the stimuli and dependent measures, and then seated at a nearby table. After completing the study, which took approximately ten minutes, participants were thanked, debriefed, and paid.

**Dependent Measures**

The same dependent measures used in the previous two studies were used in Study 3. Reliabilities for the attitude toward the product (α = .97), purchase intention (α = .83), nutrition attitude (α = .85), and credibility (α = .93) scales were all greater than the acceptable minimum level.

**Results and Discussion**

Multivariate effects of the health claim (Wilks' lambda = .86, F = 9.41, p < .001) and nutrition information (Wilks' lambda = .89, F = 3.37, p < .001) are significant. Multivariate and univariate results for relevant dependent variables appear in Table 3, and means are presented in Table 4.

Univariate results show that, as we expected, the provision of a heart-healthy claim has a favorable influence on nutrition attitude (F(1, 346) = 23.39, p < .001) and purchase intention (F(1, 346) = 4.17, p < .05). The provision of a health claim also diminishes the perceived likelihood of heart disease (F(1, 346) = 38.32, p < .001) and stroke (F(1, 346) = 20.30, p < .001). Attitude toward the product is not affected by the provision of a health claim (F(1, 346) = 1.79, p > .10), and therefore H1 is partially supported. In the case of nutrition information, univariate findings are significant for nutrition attitude (F(2, 346) = 7.63, p < .001), perceived risk of heart disease (F(2, 346) = 12.26, p < .001), and perceived risk of stroke (F(2, 346) = 6.65, p < .001). The means in Table 4 indicate that favorable nutrition informa-
**TABLE 3**  
Effects on Consumers' Evaluation Measures and Disease Risk Perceptions for Study 3

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Manova Results</th>
<th>Attitude Toward the Product</th>
<th>Nutrition Attitude</th>
<th>Purchase Intentions</th>
<th>Perceived Credibility</th>
<th>Disease Risk Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wilks' λ</td>
<td>F Value</td>
<td></td>
<td></td>
<td></td>
<td>Heart Disease</td>
</tr>
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<td>Study 3:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart-healthy claim (HC)</td>
<td>.86</td>
<td>9.41***</td>
<td>1.79</td>
<td>23.39***</td>
<td>4.17&quot;</td>
<td>1.74</td>
</tr>
<tr>
<td>Nutrition information (NI)</td>
<td>.89</td>
<td>3.37***</td>
<td>1.97</td>
<td>7.63***</td>
<td>1.98</td>
<td>2.15</td>
</tr>
<tr>
<td>Nutritional context (NC)</td>
<td>.89</td>
<td>3.17***</td>
<td>5.79***</td>
<td>10.81***</td>
<td>4.93***</td>
<td>.22</td>
</tr>
<tr>
<td>HC × NI</td>
<td>.95</td>
<td>1.47</td>
<td>.53</td>
<td>.01</td>
<td>1.37</td>
<td>.38</td>
</tr>
<tr>
<td>NI × NC</td>
<td>.89</td>
<td>1.56&quot;</td>
<td>2.31&quot;</td>
<td>2.65&quot;</td>
<td>.89</td>
<td>.15</td>
</tr>
<tr>
<td>HC × NC</td>
<td>.94</td>
<td>1.78&quot;</td>
<td>5.12&quot;</td>
<td>2.45&quot;</td>
<td>1.46</td>
<td>3.29&quot;</td>
</tr>
</tbody>
</table>

*p < .10.
"p < .05.
***p < .01.
****p < .001.

Notes: The three-way multivariate and univariate interactions are all nonsignificant.
### TABLE 4
Dependent Variable Means for Study 3

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Product Attitude</th>
<th>Nutrition Attitude</th>
<th>Purchase Intentions</th>
<th>Perceived Credibility</th>
<th>Disease Risk Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nutritional Context: Control</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No claim</td>
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<td>4.47</td>
<td>4.62</td>
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<td>5.69</td>
</tr>
<tr>
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<td>5.81</td>
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<td>5.35</td>
<td>3.54</td>
</tr>
<tr>
<td>Favorable</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>No claim</td>
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<td>4.67</td>
<td>4.97</td>
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<td>5.41</td>
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<tr>
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<td>5.34</td>
<td>5.08</td>
<td>5.39</td>
<td>3.56</td>
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<tr>
<td>Unfavorable</td>
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<td>No claim</td>
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<td>4.00</td>
<td>4.38</td>
<td>5.00</td>
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<td><strong>Nutritional Context: Healthy</strong></td>
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<tr>
<td>Control</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No claim</td>
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<td>4.51</td>
<td>4.20</td>
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<tr>
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<td>4.93</td>
<td>5.13</td>
<td>3.87</td>
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<tr>
<td>Favorable</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>No claim</td>
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<td>4.64</td>
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<td>5.14</td>
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<td>4.48</td>
<td>4.75</td>
<td>4.80</td>
<td>5.61</td>
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<td>Unfavorable</td>
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<td></td>
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</tr>
<tr>
<td>No claim</td>
<td>4.91</td>
<td>3.35</td>
<td>4.10</td>
<td>5.62</td>
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<tr>
<td>Claim present</td>
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<td>3.82</td>
<td>4.08</td>
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<tr>
<td><strong>Nutritional Context: Unhealthy</strong></td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Control</td>
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<td>No claim</td>
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<td>5.73</td>
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<td>5.00</td>
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<tr>
<td>Favorable</td>
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<tr>
<td>No claim</td>
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<td>5.63</td>
<td>5.05</td>
<td>3.50</td>
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<td>3.28</td>
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<tr>
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<tr>
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<td>5.05</td>
<td>4.48</td>
<td>4.93</td>
<td>5.05</td>
<td>4.71</td>
</tr>
</tbody>
</table>

*a* These measures are based on seven-point scales; higher scores indicate more favorable evaluations.

*b* A nine-point scale is used for each of these measures; higher scores indicate a greater perceived risk of disease.

...
FIGURE 3
Interaction Effects on Consumer Evaluations and Disease Risk Likelihoods for Study 3

Generally consistent with the nutrition level in the unfavorable condition, this indicates that consumers overrate the healthiness and effects on disease risk of these menu items.

As predicted in H7, the multivariate effect of the nutritional context by health claim interaction is significant (Wilks’ lambda = .94, F = 1.78, p < .05). Follow-up univariate analyses indicate that attitude toward the product (F(2, 346) = 5.12, p < .01) and perceived likelihood of heart disease (F(2, 346) = 3.01, p < .05) are affected by the interaction between a health claim and nutritional context, and nutrition attitude and stroke approach significance (p < .10). Plots for product attitude and heart disease are shown in the bottom portion of Figure 3. When information regarding the nutritional content of alternative menu items is not provided, inclusion of a health claim has a positive effect on evaluations and reduces perceived risk of disease (t-values range from 3.37 to 5.51, p < .01). However, when nutrition information is presented about the menu alternatives, inclusion of
a health claim has no significant effect on product attitude (t = 1.42 and .03 for the unhealthy and healthy contexts, respectively) but reduces perceived risk of heart disease (t = 3.03, p < .01 and t = 1.99, p < .05 for the unhealthy and healthy contexts, respectively).

H₈ predicts that the nutritional context in which a food is evaluated moderates the main effects of a health claim on perceived source credibility. As we show in Figure 2, Panel B, this expectation is supported (F(2, 346) = 3.29, p < .05); perceived source credibility was lowest when information was contradictory. That is, when the nutritional context was healthy, provision of a health claim diminished source credibility (t = -2.91, p < .05), but the claim had no effect on credibility when the context was unhealthy or when no context was provided (t < .50, p > .50).

**General Discussion**

The results of this research, together with the growing epidemic of obesity in the United States (Centers for Disease Control and Prevention 2002; Spake 2002), suggest that a major objective of the NLEA has not been accomplished. Although the NLEA may have helped consumers make more informed choices about foods prepared at home, it has not helped consumers with choices when dining out. Consumers now obtain more than one-third of their calories from food prepared outside the home, and because menus often provide little or no information regarding the nutritional value of the items, most consumers have little knowledge about the types and levels of nutrients they are routinely consuming. Consumers are filing class-action lawsuits against fast-food restaurants, which are charged with use of deceptive marketing practices that have resulted in obesity-related diseases (Tyre 2002).

Across our studies, the multivariate results show that there were positive effects of the inclusion of a heart-healthy claim on a package or menu. As we expected, favorable nutrition information presented on a Nutrition Facts panel (i.e., Studies 1 and 2) also led to more positive attitudes toward the product, nutrition, and purchase intentions and reduced perceived disease risk. As shown in Table 1, the effects of the nutrition information on all dependent variables were more pronounced in the menu context (Study 2) than in the package context (Study 1), even though the nutrient values were identical.

From a theoretical perspective, this research also provides insight into how nutrition information and a health claim interact to influence consumers’ attitudes and purchase intentions. These findings, together with the strong nutrition information main effects in Study 2, suggest that consumers are sensitive to and willing to use any available nutrition information when forming product evaluations and purchase intentions for menu items.

The results of Study 3 suggest that menu nutrition information does not need to be presented on a Nutrition Facts panel to have effects on consumer evaluations. Also, by providing nutrition information for the other menu items, Study 3 offers insight into the effects of nutritional context on consumer evaluations. In this more complex environment, target item nutrition information had a weaker effect, and the significant claim x nutrition information interactions were replaced by significant context x nutrition and context x claim interactions. In general, providing a nutritional context, or frame of reference from which to evaluate a specific menu item, can reduce the influence of the target item’s nutrition information on consumer evaluations.

From a conceptual perspective, this research provides new insight into the effects of the context created by competing products on target item evaluations. The effects of context on evaluations have been studied extensively in the psychology and marketing literature (see Eiser 1990; Kahneman and Miller 1986; Viswanathan and Hastak 2002), but to our knowledge, previous research has not examined how the context created by competing items interacts with both a claim about the target item and objective information about the item. The findings pertaining to the modified impact of objective information and more subjectively perceived claims when contextual nutrition information is available suggest that the effects of competing product context are more conceptually intriguing than previously assumed.

Furthermore, our findings extend prior research on labeling issues in two ways. First, the results provide evidence of the potential for interactive effects of health claim and nutrition information, at least when objective nutrition information is not available or accessed. Theoretically, this implies that the effects of the confirmatory bias of a health claim can be reduced by the provision of nutrition information. Second, the results extend findings from prior research on labeling issues to foods marketed by restaurants. Consumer evaluations and disease risk perceptions of restaurant menu items can be significantly influenced by a health claim and, especially, nutrition information on a Nutrition Facts panel. The results from this study also reinforce the notion that misleading health claims can have significant negative consequences for the marketer. A claim that was inconsistent with target item nutrition information or contextual nutrition information diminished the credibility of the restaurant. Claims that cannot be substantiated or are perceived as questionable because of context can cause considerable harm to a marketer’s reputation.

The health claim used in this study focuses specifically on the relationship between a diet low in saturated fat and cholesterol and a reduced risk of coronary heart disease. As we expected, consumers perceived the risk of heart disease and stroke to be lower when a health claim was used and no nutrition information was available. The significant interaction between health claim and nutrition information found in Study 2 suggests that a health claim can supplement nutri-
tion information presented on a restaurant menu. Even when favorable nutrition information was available, the provision of a health claim further decreased the perceived risk of stroke and heart disease.

This pattern of findings contrasts with that of the product attitude and purchase intentions variables, for which the claim had no influence when the nutrition information was favorable, as shown in Figure 1. The heart-healthy claim is incrementally useful information that serves to influence disease risk perceptions, but it does not add information that influences attitudes and intentions beyond the favorable effects of the nutrition information. When no nutrition information is presented, however, the claim is the only cue available, and it affects attitudes, intentions, and disease risk perceptions. When unfavorable nutrition information is available, the heart-healthy claim has no influence on either the evaluations or the disease risk perceptions. The overall pattern of results suggests that consumers are fairly sophisticated in their ability to use Nutrition Facts panel information to draw appropriate conclusions and are somewhat wary of health claims, preferring instead to trust specific nutrition information when it is available.

**Implications for Marketers**

Our findings show that in the absence of nutrition information, a health claim can have favorable effects on product attitudes and purchase intentions. Restaurants using health claims as promotional elements are likely to benefit from such actions, as long as the claims can be supported. It is also potentially beneficial for marketers of packaged food products to place health claims on the front of their packages, especially when targeting consumer segments that are unlikely to access nutrition information presented on the back of the package (Mitra et al. 1999, p. 110). Favorable nutrition information on Nutrition Facts panels has even stronger effects than health claims on product attitudes and purchase intentions; such favorable information seems capable of being used as an effective promotional tool for restaurants and packaged food companies. One of the objectives of the NLEA was to promote more healthful foods in the marketplace; findings from this research suggest that such initiatives can be beneficial to marketers.

The results pertaining to the effects of context in Study 3 also have managerial implications. When consumers evaluate a target menu item in the context of alternatives that are unhealthy (i.e., items high in fat and saturated fat), they have more positive attitudes and greater purchase intentions for the target item. This suggests that direct comparisons in advertisements and in-store promotions between a relatively healthy menu item and competitors' less healthy offerings should have positive effects. Essentially, a restaurant promoting healthful choices potentially can benefit from the main effects of nutritional level and nutritional context, as well as from their interaction.

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4 The recent advertising campaign by Subway, which promotes lower calorie and lower fat sandwiches as a means for consumers to obtain substantial weight loss and health benefits, is one example of how nutrition has been used for effective competitive positioning.

**Implications for Public Policy**

Although health claims made by restaurants must be consistent with the claim definitions established by the NLEA, guidelines regarding the provision of nutrition information in a restaurant setting are considerably more lenient than those for packaged food products. It may be difficult for consumers to verify claims made by restaurants in many circumstances. In the absence of nutrition information, consumers perceive the food product to be more nutritious when a health claim is presented. Thus, if a consumer considers claim information on the front of a packaged food product (where health claims are typically placed) or on a menu and nutrition information is not examined or available, he or she may have a more favorable impression of the nutritional value of the product than is warranted if the claim requirements are not completely met. When a health claim is made for a specific menu item, restaurants should be encouraged to provide the appropriate nutrient values to substantiate that claim. Although consumers may be somewhat wary of health claims in the absence of other information, the means in Tables 2 and 4 indicate that health claims are persuasive. Presenting nutrition information on restaurant menus should encourage consumers to consider the nutritiousness and healthfulness of the food they consume.

The increasing frequency with which consumers dine outside the home, the high levels of fat and saturated fat in many restaurant foods, and the large serving sizes and caloric content offered by restaurants are of great concern to many consumer welfare advocates and policymakers (Centers for Disease Control and Prevention 2002; Spake 2002; Tyre 2002). In Study 3, when no nutrition information was provided for any of the menu items, consumers rated the nutritiousness of the target product as consistent with the positive nutrition information condition. Because the levels of fat, saturated fat, and cholesterol for the menu items examined were most similar to the unfavorable nutrition condition, this finding suggests that consumers overestimate the healthfulness of restaurant items (e.g., most consumers probably are not aware that some restaurant items provide a full day's worth or more of fat and saturated fat; Hurley and Schmidt 1996). This lack of knowledge and misperception about the healthfulness of restaurant foods suggest that consumers who dine out frequently do not realize or consider the effect of their diet on long-term disease risk. We suspect that if restaurants were required to disclose nutrition levels for at least very unhealthy items, it would affect purchase behavior for many consumers and probably motivate restaurants to improve the nutritiousness of such items. Our research demonstrates that consumers generally can use health claims and nutrition information to make appropriate evaluations; however, many may lack the appropriate information or motivation to influence actual consumption behavior, particularly in restaurants.

**Limitations and Opportunities for Further Research**

There are several limitations of this study that should be acknowledged. Consumers examined either mock-ups for a packaged food product or restaurant menu items in three
studies. Consumers may behave differently in an actual restaurant setting or while grocery shopping. In addition, though a mail survey is a widely accepted means of data collection, there is minimal control over the response behavior of consumers. However, observation and greater control over the subjects were possible in Study 3 because the surveys were completed in full view of the interviewers.

We examined the effects for a single, relatively well-known health claim that links a diet low in saturated fat and cholesterol to a lower risk of coronary heart disease. This is clearly an important claim because of its link to diet and the number of people who die each year because of cardiac-related diseases. Lesser-known health claims, such as “calcium reduces the risk of osteoporosis,” may have interacted differently with nutrition information. How different types of health claims and different levels of nutrition information influence consumers’ attitudes, intentions, and perceptions of disease risk should be explored for a variety of products and contexts. Analysis of actual purchase data across different information-provision environments in restaurants would be especially valuable in better understanding how marketers and public policymakers can help consumers become more informed about the foods they eat. Marketing researchers have much to contribute to the fight against obesity, a national health problem that has reached epidemic proportions with staggering costs. Helping consumers choose more healthful foods will reduce the more than 300,000 annual deaths in the United States directly attributable to diseases and conditions associated with being overweight and obese, minimize the $110 billion in annual costs associated with diet-related diseases, and improve the overall quality of life for countless consumers.

APPENDIX

Multi-Item Dependent Measures

Nutrition Attitude (coefficient α = .84, .85)
1. I think the nutrition level of this product is (poor/good).
2. Based on the information provided, how important would this product be as part of a healthy diet? (not important at all/very important)
3. This product is (bad for your heart/good for your heart).
4. Overall, how would you rate the level of nutritiousness suggested by the information provided? (not nutritious at all/very nutritious)

Attitude Toward the Product (coefficient α = .98, .98)
Based on the information shown for this food product, what is your overall attitude toward the product? (favorable/unfavorable, good/bad, positive/negative; all reverse coded)

Purchase Intention (coefficient α = .97, .95)
1. How likely would you be to purchase the product, given the information shown?
2. Assuming you were interested in buying a lasagna food product, would you be more likely or less likely to purchase the product, given the information shown?
3. Given the information shown, how probable is it that you would consider the purchase of the product, if you were interested in buying a lasagna product?

Source Credibility (coefficient α = .89, .84)
Based on the information provided, I believe the company (restaurant) marketing this food product is: (dependable/not dependable [reverse coded], trustworthy/untrustworthy, honest/dishonest [reverse coded]).

REFERENCES


5As suggested by an anonymous reviewer, the responses of some of the consumers may have differed if an actual fast-food restaurant chain, rather than a university business school, had been identified as the sponsor of this research.

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Based on the information provided, I believe the company (restaurant) marketing this food product is: (dependable/not dependable [reverse coded], trustworthy/untrustworthy, honest/dishonest [reverse coded]).

All items were measured using seven-point scales.

Coefficient alpha estimates are reported for measures in Studies 1 and 2, respectively.

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All items were measured using seven-point scales.

Coefficient alpha estimates are reported for measures in Studies 1 and 2, respectively.


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