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The Role of Menu Organization in Food Choice

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Report Summary

Recent consumer research has targeted the issue of obesity and factors that can impact the number of calories that people consume. Of particular interest is the question of whether posting calorie information on restaurant menus is beneficial in reducing calorie consumption. Although the evidence to date is mixed, research suggests that menu design has the potential to influence the choices consumers make when ordering from a restaurant menu.

Here, authors Parker and Lehmann examine whether menu format (e.g., organization by food type, price, or calorie content) impacts the choices consumers make from food menus.

Given the notoriously idiosyncratic and typically well-held preferences that consumers have for foods, one would expect categorization and labeling to have little impact on a consumer's food choices. However, the authors find evidence that simple changes in menu structure and content can have a significant impact on these choices.

First, study 1 demonstrates that organizing a "build-it-yourself" salad menu by price significantly decreases the number of ingredients chosen, the total price of the salad, and the number of calories contained in the constructed salad. Building on this result, study 2 shows that organizing a restaurant menu by caloric content can lead to consumers choosing dishes with *higher* caloric content. In contrast, simply adding calorie information in the dish description resulted in lower-calorie choices. Study 3 then shows that these effects can be explained by examining the dishes in consumers' consideration sets. Specifically, consumers are much less likely to consider low-calorie dishes when those dishes are segregated from the other dishes and labeled as low(er)-calorie options.

These findings have significant implications for both managers and policy makers. For instance, these findings suggest that a well-intentioned restaurant chain (or government regulator) which switches to (mandates) calorie-organized menus in an effort to help consumers make better choices may, inadvertently, induce less healthy choices. Additionally, it would appear that seemingly innocuous changes made in the course of re-designing menus may have a substantial impact on consumer demand and restaurant profitability. While further research is needed to determine the magnitude of these effects, these results provide a cautionary tale about the impact of "trivial" changes to a menu's format.

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Recently, the field of consumer behavior research has witnessed an increased focus on research that has implications for increasing consumer welfare, sometimes referred to as transformative consumer research. Contained under this broad umbrella is a focus on improving consumers' choices and/or reducing their bad and unhealthy habits. Even more specifically, much of the most recent research in this area targets the issue of obesity and factors which can impact the number of calories that consumers put away. There is good reason that obesity is receiving so much attention as, according to the Centers for Disease Control, 35.7% of Americans were classified as obese (BMI $\geq$ 30) between the years 2009 and 2010; more than one in three Americans is obese.

As might be expected, many factors affect food choices. Pricing differences (Just and Wansink 2011), meal sizes (Chandon and Wansink 2007b), health claims (Andrews, Netemeyer, and Burton 1998; Geyskens et al. 2007; Roe, Levy and Derby 1999; Wansink and Chandon 2006), direct advertising (Ferguson, Muñoz, and Medran, forthcoming), bite size (Mishra, Mishra, and Master, forthcoming), stereotypes (Campbell and Mohr 2011), container shape (Raghubir and Krishna 1999), label size (Aydinoğlu and Krishna 2011), product names (Irmak, Vallen, and Robinson 2011), brand names (Chandon and Wansink 2007a), and even the physical appearance of others (McFerran, Dahl, Fitzsimons, and Morales 2010) all impact the type and amount of food consumers choose.

Of particular interest to both the academic and public policy crowds is the question of whether posting calorie information on restaurant menus is beneficial. In July of 2008, New York City became the first U.S. municipality to mandate the posting of calorie information on menus. Some evidence suggests that these labels are ineffective (e.g., Elbel, Kersch, Brescoll, and Dixon 2009), perhaps due to unexpected behavioral consequences of providing such

information (Wansink and Chandon 2006) or the time required for consumers to adapt to a new system, as was the case with unit pricing (Russo 1977). Recent findings, however, suggest that calorie posting can result in healthier choices (Bassett, et al. 2008; Bollinger, Leslie, and Sorenson 2010). It is possible that these inconsistent findings are the result of other factors such as consumer or stimulus characteristics (Dayan and Bar-Hillel 2011; Moorman 1990), or concurrent product claims (e.g., "tastes great!" Howlett, Burton, Bates, and Huggins 2009). Thus, although the exact effect of calorie posting on consumers' choices is still in question, it would seem that menu design elements have the potential to strongly impact the choices consumers make when ordering in or from a restaurant.

The primary hypothesis of this paper is that the manner in which a menu is organized (e.g., by food type vs. by price vs. by caloric content) can have a significant impact on consumers' preferences. Building on research examining categorization, agenda setting, framing, and consideration sets and choice screening, we first show that organizing a "build-it-yourself" salad menu by price (as opposed to ingredient type) can significantly reduce (i) the number of ingredients selected, (ii) the total price, and (iii) the total calories contained in the constructed salad, supporting the contention that menu organization affects choices. We next turn our attention to the impact of calorie information on choices from traditional menus. First, we demonstrate that calorie posting (including calorie information in the dish descriptions) leads to lower calorie choices (at least in the current context). Concurrently, we examine the obvious implication that, if adding calorie information leads to better choices, organizing the menu by caloric content should facilitate this process, perhaps leading to even healthier (or at least no less healthy) choices. Our results show that what is "obvious" may not be true; calorie-organized menus may actually lead to higher-calorie choices. Finally, by tracing the categories of the menu

examined by our participants, we demonstrate that this ironic effect of menu organization is likely the result of what is included in consumers' consideration sets.

Theory

Given the notoriously idiosyncratic, and typically well-held, preferences that consumers have for foods, one might not expect menu organization to have much impact on consumer preferences. After all, if you are person who does not like fish, you will not order a fish dish regardless of how the menu is organized or how the categories are labeled. Moreover, in contrast to calorie posting, menu organization does not provide any additional objective information. Yet, there is a rich history in the consumer behavior and psychology literatures of demonstrating the perverse impact that categorization, labeling, and framing can have on preferences.

Categories, labels, and consideration sets

Two descriptions of the same product differing only in their framing (e.g., 20% fat vs. 80% lean) can result in drastically different perceptions of that product (Tversky and Kahneman 1981). Similarly, a product can be given a single description (e.g., 4-door sedan, V6 engine, seating for 5, 5-star safety system) but be perceived differently depending on the category to which it is assigned (e.g., "5-star safety cars" vs. "cars with V6 engines"). The format in which retailers categorize and label their products can also affect perceptions of variety (Mogilner, Rudnick, and Iyengar 2008; Morales, Kahn, McAlister, and Broniarczyk 2005), information processing (Bettman and Kakkar 1977), product evaluation (Moreau, Markman, and Lehmann 2001; Myers-Levy and Tybout 1989), and satisfaction (Poynor and Wood 2009). Further, the

category label assigned to a product affects the inferences the consumer is likely to make about that product (Sujan and Dekleva 1987). Put simply, holding informational content constant, the manner in which retailers organize (categorize) and label options can potentially have a strong effect on consumer's choices and consumption experiences.

An aspect of categorization which is particularly relevant to the current research is its potential impact on consumers' consideration sets. Consideration sets are purposefully constructed of goal fulfilling alternatives (Shocker, Ben-Akiya, Boccara, and Nedungadi 1991) and contain "those brands (alternatives) the buyer considers when he (or she) contemplates purchasing a unit of the product class (Howard and Sheth 1969, p. 416)." To form a consideration set, consumers filter out unacceptable alternatives. As restaurant menus are typically complex, offering multiple categories (e.g., sandwiches, salads, etc.) containing multiple options (e.g., hamburger, chicken sandwich, etc.), the consumer is likely to initially filter the available alternatives using relatively simple criteria (Wright and Barbour 1977; Bettman 1979). A more detailed, perhaps compensatory or conjunctive, choice process may then be used to choose from the reduced set. Those alternatives eliminated in the initial filtering process will not be included in this more detailed analysis and thus will have no chance of being selected.

It is through the initial filtering process that menu formatting can impact consideration set formation since the simplest, or at least most salient, criteria on which to initially screen the dishes on a menu is the categories by which they are organized. For instance, imagine a consumer choosing from a menu offering sandwiches, salads, seafood, pastas, and steaks. This consumer may immediately eliminate one or two categories simply as a matter of taste (e.g., "I don't like seafood."). Subsequent screening is likely to be a function of the associations the

consumer has with each of the categories and/or the inferences the consumer makes about the dishes contained in each category (e.g., "Pastas are too filling."). Ultimately, the consumer will whittle the options down to a single category or a subset of categories.

Imagine, instead, that the restaurant had chosen to organize its menu differently, for example by price, thereby creating categories that contain items from the various categories mentioned above. For instance, the "low price" category might have a number of sandwiches, salads, and pastas. In this instance a consumer who may not have considered a pasta dish when "pastas" was a category on the menu might now consider one because it falls in the "low price" category. This is not to suggest that the consumer's opinion that pasta dishes are "too filling" won't affect their choice, but it will do so at a later stage in the decision process which is more complex and compensatory (i.e., being "too filling" may not result in an immediate rejection). In this example, the composition of the consumer's consideration set has been impacted by the menu format (i.e., the categories by which the restaurant chooses to classify its dishes), which can impact their ultimate decision.

Menu formatting and consumers' choices

In this paper, we consider three different basic menu formats (i.e., the manner in which the dishes are categorized and labeled on the menu) and examine how these different formats impact consumers preferences. In the *traditional format* dishes are organized by type (e.g., appetizers, sandwiches, seafood, and so on), and each category is labeled accordingly. A different format which has received a great deal of academic and public policy attention recently is the *calorie-posting format*, which is identical to the traditional format with the exception that calorie information is included in the description of the dishes (i.e., caloric content is included as

an attribute). In the third menu format, the *attribute-organized format*, the dishes are organized by attributes as opposed to their basic categories (Mervis and Rosch 1981). For instance, instead of categorizing automobiles into cars, trucks, SUVs, and minivans, you could categorize them into 2-door vehicles, 4-door vehicles, and so on. Alternatively, you could categorize them by price, fuel efficiency, or color. Importantly, it is not essential that the entire menu be categorized and labeled based on attributes. Instead, there may be only one category that is categorized by an attribute. Continuing the car example, a dealer could advertise cars, trucks, SUVS, and minivans, yet also have a separate category called "fuel efficient models" which might contain vehicles from any or all of the other categories.

The current paper focuses on two different attribute-organized formats: (i) price-organized, and (ii) calorie-organized. Examples of each can be found in restaurants across the U.S. For instance, many fast food establishments have value menus which separate the very inexpensive dishes from the other dishes on the menu. Similarly, restaurants of all types have begun to introduce "low-cal" or "healthy options" categories to their menus. Organizing menus in this way draws the consumer's attention to aspects of the menu that may have gone unnoticed otherwise. Aside from potentially making the restaurant and its offerings seem more appealing in a market flooded with options, price-organized and calorie-organized menus should also facilitate cheaper and healthier choices, respectively. Yet, "should" rarely equals "does."

There are a number of reasons why these menu formats may not result in the seemingly obvious outcomes. Consider a price-organized menu from which consumers select dishes or entrees (e.g., Wendy's super-value menu). A consumer who is unfamiliar with this menu might assume that those options in the lower-price category(s) are cheap, not filling, or of low quality.

Accordingly, they might not choose a dish from the value menu. However, price-organized menus won't always lead to more expensive choices.

Consider a "build-it-yourself" salad menu. These menus allow the consumer to select the exact ingredients (toppings) which will be included in their salad. Although there are various versions of this type of menu, most generally allow the consumer to include as many ingredients as they like, with each additional ingredient adding to the price of the salad. Moreover, the ingredients usually vary in price (e.g., bacon bits are more expensive than sprouts). We argue that a price-organized build-it-yourself menu should lower the overall cost of a constructed salad for two reasons. First, a price-organized menu sets a price-oriented agenda (Hauser 1986) that will increase the consumer's focus on price. Second, prices in build-it-yourself menus are usually consistent within ingredient types (e.g., vegetable toppings cost $.75 to $1) and most frequently correspond to consumers' expectations across ingredient types (e.g., proteins are more expensive than vegetables). Moreover, these ingredients are simple in nature (as opposed to more complex entrée dishes) and consumers are generally familiar with them. Thus, inferences about the individual ingredients based on price cues are unnecessary and unlikely (unless these cues deviate substantially from expectations, which would affect the consumer's beliefs about all of the ingredients). Thus, when constructing a salad, the consumer should constrain his or her choices based on price, but do so without the negative associations we would expect to find with a value menu (which is dish, vs. ingredient, based). Accordingly, the overall price, number of ingredients, and total calories in the constructed salad should be lower when ingredient choices are made from a price-organized menu. We verify this prediction in study 1, thereby demonstrating that menu organization can affect consumers' food choices.

Building on this finding, we turn our attention to calorie-organized menus. While it is possible for a build-it-yourself menu to be organized by calories, this is rarely if ever encountered in real restaurants (an informal sample of 20 delis found that none organized their build-it-yourself salad menu by caloric content). Accordingly, we consider a dish-based, calorie-organized menu. How will choices made from such calorie-organized menus differ from those made from traditional or calorie-posting menus? Again, one might suspect that choices will either become healthier or, at a minimum, remain as healthy as those made from calorie-posting menus. However, there is reason to believe this will not be the case.

First, categories such as "low-calorie" or "healthy options" might cue inferences about the dishes they contain (e.g., the dishes are "not filling" or "taste bad") that might reduce the likelihood of this category passing the first screening mentioned earlier. This, of course, depends on the mental associations consumers have for the healthy (and "unhealthy") dish categories and/or the inferences they make about healthy (unhealthy) dishes. Consider a consumer who holds negative associations with "low-calorie" or "healthy" labels[1]. When dishes on the menu are categorized and labeled by their caloric content, low calorie dishes are unlikely to pass the initial screening process and, consequently, will not be included in the consumer's consideration set. Conversely, if the healthy or low-calorie dishes are not organized and labeled separately, but instead are included in their respective food-type categories (e.g., sandwiches, salads), we predict that they are more likely to be included in the consumer's consideration set. Consequently, we contend that a consumer will be much more likely to choose a healthy dish in the latter situation.

Why would the same consumer who would summarily dismiss an entire low calorie category be more likely to choose a low calorie dish when the menu is not calorie organized?

[1] Consumers who care a great deal about caloric intake will likely have very positive associations with low-cal or healthy menus. However, these individuals are likely to search out low-calorie dishes regardless of menu organization and, therefore, are unlikely to be affected by a calorie-organized menu (i.e., there will be a ceiling/floor effect as these individuals' choices can't become much healthier).

The answer lies in the depth of processing that occurs once the consideration set is formed. Assuming the number of relevant alternatives in a consideration set is sufficiently small that the consumer can compare them in a detailed manner, simple inferences about the alternatives are unnecessary. In fact, the consumer can now evaluate all of the tradeoffs that will occur if one meal is selected over another. For instance, if the consumer wants that tasty barbecue bacon cheeseburger with fries, he is going to have to accept the high calorie count that comes with it.

Assume that a low-calorie option is also contained within the consumer's consideration set (perhaps a simple burger with veggies instead of fries, or a turkey burger). The consumer can readily ascertain that he will have to give up something in taste to get fewer calories but will still, at a minimum, get something within his consideration set. In other words, he may not be choosing the biggest, baddest burger on the menu, but he is still getting a burger, and will consume fewer calories than he would have had he chosen otherwise. Thus, the likelihood that he will choose the healthier meal increases significantly simply due to the healthy option being included in his consideration set.

The essence of our argument is that the point in the decision process at which calorie information is considered will significantly moderate the impact this information has on the healthiness of consumers' choices. Further, we suggest that the point at which calorie information is considered can be altered by simple transformations of menu formats. Support for these predictions is presented in studies 2 and 3.

We now present the three studies that test our predictions. Each shows that menu formatting can significantly alter the amount or types of foods consumers choose. Subsequently, we discuss the implications of our findings for restaurateurs, public policy makers, and also

consider the more general implications of these findings. We further outline the limitations of the current work and posit future directions.

Study 1: The Impact of Price Organization

There is a wide array of menu formats which consumers may encounter. Perhaps the most common menu format is one in which the options are organized by dish- or food-type (the traditional format). However, there is a growing trend in the deli and fast-casual industries: the build-it-yourself (BIY) salad. Although the customer does not necessarily assemble their own salad, they do choose the exact variety and number of ingredients (toppings) to be in (on) their salad. The process generally starts with a choice of lettuce (e.g., Romaine vs. Mesclun). At times there is also a choice of size, typically large versus small. The customer then constructs their salad from a menu of ingredients. Each ingredient has a price, and each additional ingredient adds to the cost of the salad. Accordingly, customers are allowed to include as many ingredients in their salad as they like.

The vast majority of delis with BIY salads organize their ingredient menus in one of two ways: (1) by price, or (2) by ingredient type (e.g., vegetables vs. cheeses vs. meats) [2]. While most deli owners probably choose their method of organization based on simple personal preferences, with little suspicion that this might impact their customers' choices, we argue that this seemingly trivial difference in menu format will have a significant impact on the salads consumers construct. Specifically, we expected that participants in this study would choose fewer ingredients when the menu was organized by price, resulting in cheaper and lower calorie salads.

[2] There is another pricing model in which the total price of the salad is determined by its final weight. However, as this method is relatively rare, we focus on the price-organized format here.

Stimuli

Two BIY salad ingredient menus were developed for this study. The list of ingredients included in this menu, and their respective prices, was based on a convenience sample of local delis in Manhattan, New York. The type-organized menu (depicted in figure 1.1; figures follow references throughout) organized the ingredients into (i) Vegetable, (ii) Dairy, (iii) Nuts, Berries, and Fruits, and (iv) Protein categories. The price-organized menu (figure 1.2) organized the ingredients into (i) $.50, (ii) $.75, (iii) $1.00, and (iv) $1.50 categories. To minimize differences between the two menus, both included prices next to each ingredient in parentheses. The different outlines in figures 1.1 and 1.2 show that items from different price categories were contained within each food-type category. For instance, while every $.50 ingredient was a vegetable, not every vegetable cost $.50. (These outlines were not shown to the participants.)

Procedure

Sixty-five paid participants were recruited from a national online subject pool for this study. Each participant was prescreened for dietary restrictions including vegetarianism, veganism, pescatarianism, and food allergies that preclude them from eating specific types of foods. Participants who indicated any of these dietary restrictions were excluded from the survey. This same procedure was used for studies 2 and 3 as well.

Participants were given a link to this study, which was administered on the online survey tool, Qualtrics. The participants were asked to imagine that they were in a deli and were in the process of deciding what ingredients to include in a BIY salad they had decided to order for lunch. The instructions explicitly asked the participants to take their time and choose as they

normally would were they actually building a salad for themselves. No mention was made of budget or salad size limitations.

Each participant was randomly assigned to one of two menu formats: type- versus price-organized. Participants first selected a lettuce from three options (romaine, spinach, and mesclun), all priced equally. They then proceeded to choose the ingredients that they would include in their salad. Participants were free to choose as many ingredients as they liked. Once they had selected all of their ingredients, the participants proceeded to the next screen and indicated their age and gender. The total number of ingredients, the total price, and the total caloric content of the participants' constructed salads were analyzed to determine if menu format had impacted preferences as expected.

Results and discussion

We first examine the total number of ingredients selected in each condition. As predicted, participants chose significantly fewer ingredients when choosing from a price- (vs. food-type-) organized menu (M = 7.09 vs. 9.45, $F(1,63) = 10.70$, $p < .01$). This difference in the number of selected ingredients resulted in significantly different prices as well (M = \$5.56 vs. \$6.93, $F(1,63) = 5.80$, $p < .05$). We were also interested in the impact of menu formatting on the caloric content of the constructed salads. Therefore, we determined the number of calories in each ingredient for the typical serving size found in real-world BIY salads. This allowed us to estimate the total number of calories in the salads our participants constructed. As expected, there were fewer calories in salads constructed from price- (vs. food-type-) organized menus (M = 532.88 vs. 645.97, $F(1,63) = 3.40$, $p < .07$). Finally, because this method of determining caloric content is not perfect, and because the actual number of calories contained within a salad may

not reflect consumers perceptions of the caloric content (i.e., people may think they are choosing healthier items than they actually are), we had 23 participants from the same population, who did not participate in the main study, rate the healthiness of each ingredient on one (not healthy at all) to seven (very healthy) scales. As expected, these healthiness ratings were significantly negatively correlated with our calorie estimates (R = -.60, p < .001), suggesting that the participants were aware of the relative caloric content of the ingredients they selected.

In sum, we find strong evidence that differences in menu format can have a significant impact on consumers' choices. By simply shifting from a type-organized to a price-organized menu, the number of ingredients selected, the total price, and the caloric content of the constructed salads of our participants were significantly reduced. This suggests that other types of attribute-organized menus might also impact consumer preferences. Of particular interest are calorie-organized menus which one would suspect would lead to healthier choices. The following two experiments build on the results of study 1, showing that choices from calorie-organized menus differ from those made from traditional menus and that the impact of menu formatting on choice is driven by its impact on consideration set formation.

Study 2: Does Calorie Organization Help Or Hinder Healthy Choices?

If price-organized menus can lead to less expensive choices, will calorie-organized menus lead to lower calorie choices? To examine this question, we shift from BIY menus to more traditional dish-based menus. This was done for three reasons. First, BIY salad menus are infrequently organized by calories, if ever, as mentioned before. Second, recent research on the impact of calorie-posting menus (i.e., menus that include calorie information as an attribute for

each dish/item) on preferences also focuses on dish-based menus. Third, and finally, these menus are much more common than BIY menus. Accordingly, it seems important to examine the current hypotheses within a dish-based menu context.

While calorie-organized menus should be expected to facilitate and encourage healthier choices, they may have the ironic effect of inducing less healthy choices. Determining which of these two outcomes is more likely to occur is of vital importance; especially since the intuitive conclusion is that calorie-organized menus should be nothing less than equally as beneficial as calorie-posting menus (if they themselves are actually beneficial). Thus, a well-intentioned restaurant chain (or government regulator) may switch to (mandate) calorie-organized menus in an effort to help consumers make better choices but, inadvertently, induce less healthy choices.

This study was designed with two goals in mind. First, we wanted to examine the impact of calorie-posting menus on preferences. We predicted that adding calorie information to the descriptions of each dish would lead to lower calorie choices, consistent with the findings of Bassett, et al. (2008) and Bollinger, Leslie, and Sorenson (2010). Second, it was important to determine if additionally organizing the menu (at least partially) by caloric content would have any effect on preferences beyond that of the calorie-posting menu and, if so, if this effect would be positive or negative (i.e., would it result in healthier or less healthy choices). We predicted that calorie-organized menus would lead to less healthy choices than those made from calorie-posting menus.

Stimuli

Four differently formatted menus were created for this study. The fourteen dishes on the menus were identical expect in (i) how they were organized and labeled, and (ii) the fact that the

traditional menu contained no calorie information. As can be seen in figures 2.1 and 2.2, the traditional and calorie-posting menus contained three categories of dishes (Salads, Sandwiches, and Platters). In contrast, the calorie- and price-organized menus contained only two categories (see figures 2.3 and 2.4). The calorie-organized menu contained "Under 700 Calorie Menu" and "Traditional Options" categories, while the price-organized menu contained "Traditional Options" and "Under $9 Menu" categories. Aside from the different labels, the calorie- and price-organized menus were identical. To achieve this, the caloric content and prices of the dishes were negatively correlated (i.e., the low calorie dishes were more expensive than the high calorie dishes). Importantly, both the calorie- and price-organized menus included calorie information in the descriptions of the dishes. As a final note, since recent findings suggest that calorie information does not impact beverage choices (Bollinger, Leslie, and Sorenson 2010), the categorization and labeling of the beverages was not manipulated and, accordingly, participants beverage preferences were neither measured nor analyzed.

Procedure

Ninety-four paid participants recruited from a national online subject pool participated in this study. The study was administered on Qualtrics and participants received a link to this study. Participants were asked to imagine that they had decided to have lunch at Timmy's Diner, a restaurant which they had not previously visited. Participants were then taken to the menu screen where they were randomly assigned to receive one of the four previously described menu formats. Participants were allowed to view the menu as long as they wished (interestingly, those in the traditional format condition spent the least amount of time viewing the menu) after which they clicked an "I'm ready to order" button at the bottom of the screen. The next page then listed

the items available for choice in the same format they were found on the menu and provided the menu for reference at the bottom of the page. Once they had made their selection, the participants indicated their age and gender. The dependent variable of interest in this study was the caloric content of the selected dishes.

Results and discussion

A four-level, single-factor ANOVA revealed significant differences in the caloric content of the selected dishes between conditions ($F(3,90) = 4.45$, $p < .01$). Planned contrasts were used to determine if the predicted pattern of results occurred. The full pattern of results is presented in figure 2.5.

The first goal of this study was to determine if adding calorie information to the descriptions of dishes on a traditional menu (resulting in a calorie-posting menu) would result in lower calorie choices. Our results suggest that calorie-posting menus can be beneficial. Those choosing from the calorie-posting menu chose dishes with significantly fewer calories than did those choosing from the tradition menu ($M = 791.67$ vs. 1199.41, $F(1,90) = 6.18$, $p < .05$). Thus, it may have been wise for New York City to mandate calorie-posting menus.

The second goal of this study was to investigate the impact of two different attribute-organized menus: (i) a price-organized menu, and (ii) a calorie-organized menu. Recall that these menus were identical with the exception that the categories were labeled differently (see figures 2.3 and 2.4). Also, recall that both of these menus included calorie information within the dish descriptions (i.e., at the attribute level), just like the calorie-posting menu, but that the calorie-organized menu also organized and labeled the menu by calories. We first examine the relative impact of the price-organized menu.

If lower prices suggest lower quality, one might expect that the price-organized menu to result in higher priced choices. Further, since caloric content and price were negatively correlated in this study, this would also result in lower calorie choices. If the negative effects of quality inferences based on price and the impact of calorie information are additive, we might expect that choices from the price-organized menu would be even lower in calories than those from the calorie-posting menu (because both cues push the consumer toward the lower calorie options). This, however, did not occur. In fact, there was almost no difference in the caloric content of the selected dishes between the calorie-posting and price-organized menus (M = 791.67 vs. 797.94, $F < 1$). Thus, calorie-posting menus and menus which were price organized with calorie posting were equally beneficial in terms of number of calories chosen.

As with the price-organized menu, there is reason to believe that the calorie-organized menu (which includes calorie-posting) will lead to choices no less, and perhaps more, healthy than those made from the calorie-posting menu. However, we predicted the opposite effect based on the negative associations many consumers have with low-calorie options which would reduce the likelihood these dishes would be considered at all. The results supported our predictions. Compared to choices made from the calorie-posting and price-organized menus, those made from the calorie-organized menu had a significantly higher average caloric content (M = 1061.61, $F(1,90) = 6.23$, $p < .05$). Moreover, they were not significantly different from choices made from the traditional menu ($F(1,90) = 1.10$, $p > .29$).

In sum, despite keeping calorie information in the description of each dish, the act of merely organizing and labeling the menu by caloric content effectively erased the positive impact of calorie posting. At this point, why this happens is unclear. We propose that these results are the outcome of changing consideration sets and test this hypothesis in study 3.

Study 3: That Which Isn't Considered Can't Be Chosen

Studies 1 and 2 have shown that menu formatting can have a dramatic impact on consumers' choices. These findings have important implications for managers and public policy officials. Thus, it is important to understand why these effects occur. Of particular interest is the finding the calorie-organized menus result in choices that are as unhealthy as choices made from traditional menus. Shouldn't highlighting healthy options lead to increased choice shares for these options? It would seem not, and we believe this happens because of the impact that menu formatting has on consideration set formation.

Study 3 examines the process underlying the results in studies 1 and 2 by tracking the categories of the menu each participant views. This allows us to infer the participants' consideration sets and information search processes. This study also corrects two potential weaknesses of study 2. First, the attribute-organized menus in study 2 contained only two categories while the traditional and calorie-posting menus contained three categories. Additionally, the category labels were changed in the attribute-organized menus. While these design elements cannot explain the total pattern of results in study 2, study 3 maintains the same number of categories across all menu formats and changes the label of only one category across the different formats. Accordingly, should we find the same pattern of results in study 3, we can be confident that they are not the byproduct of varying numbers of categories or complete shifts in category labels. Second, price and caloric content were strongly correlated in study 2 ($R = -.681$, $p < .01$). Conversely, price and caloric content were uncorrelated in this study ($R = .061$, $p > .79$), allowing for more straightforward inferences about the impact of calorie-organized menus on preferences.

Stimuli

Aside from replicating the results of study 2, the primary goal of this study was to infer the dishes included in the participants' consideration sets and see if this systematically varied across menu formats. While it is possible to simply ask participants which dishes they included in their consideration set, it is unlikely that they will be able to accurately report their actual consideration sets (Nisbett and Wilson 1977). In fact, it is probable that explicitly reported consideration sets would be affected by the participants' ultimately chosen dishes. Accordingly, the menus in this study were constructed such that the menu categories viewed by the participant could be tracked and recorded for analysis.

As opposed to the previous studies, participants in this study were asked to imagine that they were ordering from an online menu (exact details follow in the procedure section). The participants needed to click the name of a given menu category to view the dishes contained in that category. This menu design is very common among online menus (see, campusfood.com or allmenus.com for examples) and allows us to trace the different menu categories considered by the participants during their choice processes (i.e., infer their consideration sets).

Two menu format factors were manipulated in this study: (i) calorie information either was or was not present in the dish description and (ii) the menu either was or was not (partially) organized by calorie information. This resulted in a 2 (calorie-posting: yes vs. no) x 2 (calorie-organized: yes vs. no) between-subjects design. All menus contained five categories. The first four categories (and their labels) were constant across the various menus: (i) Sandwiches & Burgers, (ii) Chicken & Steak, (iii) Seafood, and (iv) Pastas. The fifth category was labeled either "House Favorites" (when the menu was not calorie organized) or "Under 500 Calories" (when the menu was calorie organized).

When the menu was not calorie organized, the fifth category ("House Favorites") was populated with one dish from each of the other four categories, each of which contained 1000 or more calories. Meanwhile, each of the other four categories contained one dish which was below 500 calories (i.e., the healthy options in this study), while the remaining three dishes were all 990 calories or greater. When the menu was calorie organized, the fifth category ("Under 500 calories") was populated with the four under-500-calorie dishes from each of the other four categories, while those dishes which were in the House-Favorites category when the menu was not calorie organized were assigned to their respective categories of the menu. The full menus are presented in figures 3.1 through 3.4.

Procedure

Four hundred three participants recruited from a national online subject pool participated in this study. The study was administered on Qualtrics and participants received a link to this study. Participants were asked to imagine that a friend had recommended a restaurant called "Harvest Moon" to them. This friend informed them that Harvest Moon recently started an online ordering service with free delivery and that she was very satisfied with the process and the quality of the food. The participants were then asked to imagine that they had decided to try this service out for dinner that evening. The following instructions were given to the participants.

> *Next, you will see an online ordering system for a restaurant. On the first screen, you will see a list of the sections of the menu. This is called the "homepage." You may click any of the menu sections to view the dishes in that section of the menu. Within each section, you may click "main courses" to return to the "home page" if you like.*
>
> *When you find the dish you would order in real life, simply click the name of that dish then ">>" to order that dish.*

We are interested in how you would normally choose a meal if you were really ordering from an online restaurant. That is, we are interested in the dish you would choose, as well as the time you would normally take and the process you would use to make this choice.

We would like you to go through this menu exactly as you would were you actually ordering food for yourself.

If you immediately find a dish that you would order, please click it and "order" it at that point. If you don't find a dish immediately, please take your time to make your decision. Just do whatever comes naturally.

NOTE - Please DO NOT use the "back" button on your browser during this study. Only navigate the menu by clicking on the section you want to see (or "main courses") and then the ">>" button.

The participants were then directed to the homepage screen which was identical across menu formats (except for one dish category), and which can be found in the upper left panel of figures 3.1 through 3.4. The participants were free to navigate the menu as they wished at their own pace. The sequence and number of menu categories considered by each participant, as well as their ultimate choice, was recorded. It was expected that participants choosing from a calorie-organized menu would (i) be unlikely to consider the "Under 500 Calorie" menu and, consequently, (ii) be likely to choose dishes containing significantly more calories.

Results and discussion

We first focus on the caloric content of the selected dishes (see figure 3.5). A 2 (calorie-posting: yes vs. no) x 2 (calorie-organized: yes vs. no) between-subjects ANOVA revealed the expected pattern of results. To begin, there was a marginally significant main effect of calorie organization; choices from the calorie-organized menus contained more calories than choices from the traditional menus (M = 1126.53 vs. 1069.12, $F(1,399) = 2.71$, $p = .1$). A stronger effect

of calorie-posting was found; choices made from calorie-posting menus contained significantly fewer calories than did choices from non-calorie-posting menus (M = 1057.65 vs. 1135.93, $F(1,399) = 4.66$, $p < .05$). However, both of these main effects were qualified by the expected interaction ($F(1,399) = 10.56$, $p < .01$). Planned contrasts revealed that calorie posting (vs. not) resulted in significantly lower calorie choices when the menu was not calorie organized (M = 975.78 vs. 1164.31, $F(1,399) = 14.82$, $p < .001$), but not when the menu was calorie organized (M = 1146.42 vs. 1108.37, $F < 1$). Simply put, calorie posting was beneficial only when the menu was not further organized by caloric content. Thus, replicating the results of study 2, we again find that organizing a menu by caloric content effectively erases the positive impact of calorie posting.

We hypothesized that the negative impact of calorie-organized menus operates through their impact on consumers' consideration sets. Accordingly, we now turn our focus to the information search, or consideration-set formation, processes of the participants. As we progress through this analysis, it is important to keep in mind the location of the healthy dishes on the menu across the conditions. In the calorie-organized conditions, all of the healthy (low-cal) dishes were grouped into one category and labeled "Under 500 Calories." Conversely, when the menu was not calorie organized, all of the healthy items were placed in their respective food-type categories, and the dishes they displaced were grouped into one category labeled "House Favorites."

Perhaps the simplest measure of the impact of menu format on consideration sets is the percentage of participants that viewed a category containing at least one low-calorie dish. If the consumer never considers a category containing a low-calorie dish, they can never select a low-calorie dish, by definition. As expected, a significantly lower proportion of participants

considered at least one menu category containing a low-calorie option when the menu was (vs. was not) calorie organized (29% vs. 94%, $\chi^2 = 187.01$, $p < .001$). Moreover, a linear regression revealed that considering a category containing a low-calorie dish was a significant predictor of the caloric content of the ultimately selected dish ($\beta = -256.53$, $t = -7.46$, $p < .001$).

Still, one might argue that participants in this study were not particularly motivated. On top of that, the "Under 500 Calories" and "House Favorites" menus were always listed at the bottom of the main menu (i.e., were always the 5th category listed). Accordingly, it might be that participants were simply unlikely to consider the fifth category of the menu at all, and that the choice differences observed in this study are an artifact of the fact that all of the healthy options were in the fifth category in the calorie-organized condition. If this argument holds, then we should find that very few participants considered the fifth category both when the menu was, and was not, calorie organized. Moreover, we should find no difference between these two conditions. However, analyzing the percentage of participants who considered the fifth category at least once (regardless of its contents and/or label), reveals that not only did a significant proportion of participants consider the fifth category in each condition, but also that a significantly greater proportion of participants considered it when it was labeled "House Favorites" than when it was labeled "Under 500 Calories" (49% vs. 29%, $\chi^2 = 15.92$, $p < .001$). Thus, it is unlikely that the findings are the result of a lack of involvement or an artifact of the stimuli design.

Continuing with our analysis, recall that menu formatting is expected to impact consideration sets at the initial screening stage. Within the context of restaurant menus, the menu categories and their associated labels are the most salient criteria on which to initially screen the options. Some consumers may be very aggressive in this screening process, perhaps only

considering dishes within a single menu category. Other consumers are likely to consider several categories, perhaps all of them. Whatever the motives or circumstances are that lead a given consumer to behave in one manner or the other, the net result is that consumers with less aggressive screening strategies are more likely to consider any given category than are those with more aggressive screening strategies. Consequently, we would predict that consumers with less aggressive screening strategies would be less affected by menu formatting than those with more aggressive strategies.

This suggests that further evidence that calorie-organized menus impact preferences via consideration differences may be found by differentiating participants based on the number of menu categories they considered. The median number of menu categories considered in this study was two, the mode was one, and 41% of participants viewed three or more categories. Thus, there was a reasonable degree of heterogeneity in this sample in regards to the amount of the menu considered prior to choice. For the purposes of the following analyses and discussion, we perform a median split on our sample based on the number of menu categories viewed by the participant. Those who viewed one or two categories are hereafter considered to have had small consideration sets. Those who viewed three or more categories are hereafter considered to have had large consideration sets. Again, it was expected that the calorie-organized menu would have a more negative impact on the choices of those with small consideration sets.

A 2 (number of categories viewed: <= 2 vs. > 2) x 2 (calorie-posting: yes vs. no) x 2 (calorie-organized: yes vs. no) between-subjects ANOVA revealed the expected pattern of results (the means are presented in figure 3.6). This analysis revealed the main effect of calorie posting and the interaction between calorie posting and calorie organization discussed previously. In addition, a second significant two-way interaction between calorie organization

and the median split on number of categories viewed was found ($F(1,395) = 4.46$, $p < .05$). In fact, as can be seen in figure 3.6, calorie posting significantly reduced the number of calories chosen when the menu was not calorie organized, regardless of the size of the participant's consideration set. Moreover, a planned contrast revealed that when the menu was not calorie organized there was no difference between those with small versus large consideration sets (M = 1062.67 vs. 1077.97, $F < 1$) after collapsing across calorie-posting conditions. However, when the menu was calorie organized, the story was much different; a second planned contrast revealed that those with small consideration sets chose dishes with significantly more calories than those with large consideration sets (M = 1177.25 vs. 1049.49, $F(1,399) = 6.00$, $p < .05$). These results indicate that the calorie-organized menu once again had a negative impact on choices, but more-so amongst those participants with small consideration sets.

Collectively, the results of study 3 support the findings of studies 1 and 2. Consistent with both of the previous studies, menu formatting had a significant impact on choice. Further, these findings replicate the results of study 2. Specifically, while calorie posting significantly decreased calorie consumption, calorie organization erased these benefits. Finally, this study has demonstrated that these effects are the result of the impact that calorie organization has on the consumers' consideration sets.

General Discussion

Obesity is an epidemic within the United States. Recent efforts within the marketing literature have looked at both the causes of obesity and possible interventions that could lead to reductions in the obesity rate. This paper follows in the footsteps of this work. We have

examined the impact of menu formatting on consumers' food choices. At first glance, it would seem that simple changes in categorization and labeling should have little, if any, effect on consumers' choices. However, the three studies presented here find otherwise.

Study 1 first demonstrated that the categorization of the ingredients on a build-it-yourself salad menu can substantially change the salads that consumers construct. Specifically, participants in study 1 chose significantly fewer ingredients when those ingredients were organized and labeled by price (vs. type), which resulted in salads which were both cheaper and contained fewer calories. Interestingly, this happened despite the fact that each ingredient had its price listed next to it regardless of menu type, indicating that an attribute-organized menu may increase the importance of a given attribute in the decision without providing any additional information to the consumer. Thus, it was established that seemingly trivial adjustments in menu formatting could change consumers' preferences.

Turning to a more traditional menu format (i.e., one organized by dishes as opposed to ingredients), study 2 had two goals. First and foremost, study 2 aimed to extend the findings of study 1 to other attributes; specifically, calorie information. Second, study 2 also tested the proposition that calorie-posting (adding calorie information in description of the dishes) leads to lower-calorie choices, a finding that has received mixed support in the literature. Our results indicate that calorie-posting does lead to lower-calorie choices. However, this held only when the menu was not calorie organized. In fact, even though each dish contained calorie information at the attribute level, choices from the calorie-organized menu were as poor (high calorie) as choices from the traditional menu (i.e., one with no calorie information whatsoever). Additionally, it was found that the price-organized menu led to lower-calorie, higher-priced choices (price and caloric content were negatively correlated in this study).

Study 3 was designed to both replicate the seemingly counterintuitive effect found with calorie-organized menus in study 2, and to examine the process underlying these effects. Replicating study 2, the calorie-organized menu again wiped out the beneficial impact of calorie-posting (which, itself, was found to have positive effects again). Moreover, analysis of the menu categories considered by the participants in this study revealed that menu formatting impacted participants' choices by affecting the consideration sets they formed. When low-calorie dishes were grouped and labeled as such, they were significantly less likely to be considered at all (especially among those with small consideration sets) and, accordingly, were significantly less likely to be selected.

These results suggest something that runs counter to what might be expected. Organizing and highlighting healthy or low-calorie dishes should facilitate better (lower-calorie) choices. This, however, is not the case. This suggests that restaurateurs and policy makers should be careful when they try to improve consumers' diets. That which may be a well-intentioned effort to reduce obesity might ultimately result in higher calorie diets.

Of course, as with all research, there are limitations to the current findings. For instance, all of the choices made in these studies were hypothetical due to our focus on building controlled studies which would allow for the cleanest possible results and afford us the ability to examine the process underlying those results. However, the pattern of results across these studies suggests that our participants took the choice tasks seriously as we did not find that everyone chose indulgently in these consequence-free scenarios. Moreover, previous research has shown that hypothetical choices and judgments may actually result in an underestimation of the magnitude of the true effect that would result from real choice (Kivetz and Simonson 2002, pg. 207). Nonetheless, the results would benefit from either real-choice (in a lab) or real-world

replications. Additionally, we restricted our focus to two specific types of attribute-organized menus: (i) by price, and (ii) by calorie. Other operationalizations of the attribute-organized menu may reveal additional interesting preference shifts. Finally, we have limited our investigation to the U.S. population. This, in large part, is due to the prevalence of obesity within the U.S. Still, it would be interesting to see how these results vary by country and culture.

On a final note, while the current investigation has focused on food consumption and menu formatting, the implications of these results need not be limited to these realms. In fact, it is reasonable that these findings could generalize to many other product categories in which different categorizations can lead to preference shifts. Contemporary issues including the adoption green products and services and fiscally responsible investing might benefit from a consideration of the impact of minor categorization differences. We hope that these and other issues are examined in this light by future research.

References

Andrews, J. Craig, Richard G. Netemeyer, and Scot Burton (1998), "Consumer Generalization of Nutrient Content Claims in Advertising," *Journal of Marketing*, 62(4), 62-75.

Aydinoğlu, Nilüfer Z. and Aradhna Krishna (2011), "Guiltless Gluttony: The Asymmetric Effect of Size Labels on Size Perceptions and Consumption," *Journal of Consumer Research*, 37(6), 1095-1112.

Bassett, Mary T., Tamara Dumanovsky, Christiana Huang, Lynn D. Silver, Candace Young, Cathy Nonas, Thomas D. Matte, Sekai Chideya, and Thomas R. Frieden (2008), "Purchasing Behavior and Calorie Information at Fast-Food Chains in New York City, 2007," *American Journal of Public Health*, 98(8), 1457-1459.

Bettman, James. (1979). *An Information Processing Theory of Consumer Choice.* Reading, MA: Addison-Wesley.

Bettman, James R., and Pradeep Kakkar (1977), "Effects of Information Presentation Format on Consumer Information Acquisition Strategies," *Journal of Consumer Research*, 3(4), 233-240.

Bollinger, Bryan, Phillip Leslie, and Alan Sorenson (2010), "Calorie Posting in Chain Restaurants," *working paper*, Stanford University.

Campbell, Margaret C. and Gina S. Mohr (2011), "Seeing Is Eating: How and When Activation of a Negative Stereotype Increases Stereotype-Conducive Behavior," *Journal of Consumer Research*, 38(3), 431-444.

Chandon, Pierre and Brian Wansink (2007a), "The Biasing Health Halos of Fast-Food Restaurant Health Claims: Lower Calorie Estimates and Higher Side-Dish Consumption Intentions," *Journal of Consumer Research*, 34(3), 301-314.

----- (2007b), "Is Obesity Caused by Calorie Underestimation? A Psychophysical Model of Meal Size Estimation," *Journal of Marketing Research*, 44(1), 84-99.

Dayan, Eran and Maya Bar-Hillel (2011), "Nudge to Obesity II: Menu Positions Influence Food Orders," *Judgment and Decision Making*, 6(4), 333-342.

Elbel, Brian, Rogan Kersh, Victoria L. Brescoll, and L. Beth Dixon (2009), "Calorie Labeling and Food Choices: A First Look at the Effects on Low-income People in New York City," *Health Affairs*, 28(6), w1110 – w1121.

Ferguson, Christopher J., Monica E. Muñoz, and Maria R. Medrano (forthcoming), "Advertising Influences on Young Children's Food Choices and Parental Influence," *The Journal of Pediatrics*.

Geyskens, Kelly, Mario Pandelaere, Siegfried Dewitte, and Luk Warlop (2007), "The Backdoor to Overconsumption: The Effect of Associating 'Low-Fat' Food with Health References," *Journal of Public Policy and Marketing,* 26(1), 118-125.

Hauser, John R. (1986), "Agendas and Consumer Choice," *Journal of Marketing Research,* 23(3), 199-212.

Howard, John A. and Jagdish N. Sheth. (1969). *The Theory of Buyer Behavior.* New York: John Wiley.

Howlett, Elizabeth A., Scot Burton, Kenneth Bates, and Kyle Huggins (2009), "Coming to a Restaurant Near You? Potential Consumer Responses to Nutritional Information Disclosure on Menus," *Journal of Consumer Research,* 36(3), 494-503.

Irmak, Caglar Beth Vallen, and Stefanie Rosen Robinson (2011), "The Impact of Product Name on Dieters' and Nondieters' Food Evaluations and Consumption," *Journal of Consumer Research,* 38(2), 390-405.

Just, David R. and Brian Wansink (2011), "The Flat-Rate Pricing Paradox: Conflicting Effects of 'All-You-Can-Eat' Buffet Pricing," *The Review of Economics and Statistics,* 93(1), 193-200.

McFerran, Brent, Darren W. Dahl, Gavan J. Fitzsimons, and Andrea C. Morales (2010), "I'll Have What She's Having: Effects of Social Influence and Body Type on the Food Choice of Others," *Journal of Consumer Research,* 36(6), 915-928.

Mervis, Carolyn B. and Eleanor Rosch (1981), "Categorization of Natural Objects," *Annual Review of Psychology,* 32(1), 89-115.

Mishra, Arul, Himanshu Mishra, and Tamara M. Masters (forthcoming), "The Influence of Bite Size on Quantity of Food Consumed: A Field Study," *Journal of Consumer Research.*

Moorman, Christine (1990), "The Effects of Stimulus and Consumer Characteristics on the Utilization of Nutrition Information," *The Journal of Consumer Research,* 17(3), 362-374.

Morales, Andrea, Barbara E. Kahn, Leigh McAlister, and Susan M. Broniarczyk (2005), "Perceptions of Assortment Variety: The Effects of Congruency Between Consumers' Internal and Retailers' External Organization," *Journal of Retailing,* 81(2), 159-169.

Myers-Levy, Joan, and Alice M. Tybout (1989), "Schema Congruity as a Basis for Product Evaluation," *Journal of Consumer Research,* 16(1), 39-54.

Nisbett, Richard E. and Timothy DeCamp Wilson (1977), "Telling More Than We Can Know: Verbal Reports on Mental Processes," *Psychological Review* 84(3), 231-259.

Poynor, Cait, and Stacy Wood (2009), "Smart Subcategories: How Assortment Formats Influence Consumer Learning and Satisfaction," *Journal of Consumer Research,* 37(1), 159-175.

Raghubir, Priya and Aradhna Krishna (1999), “Vital Dimensions in Volume Perception: Can the Eye Fool the Stomach? *Journal of Marketing Research,* 36(3), 313-326.

Roe, Brian, Alan S. Levy, and Brenda M. Derby (1999), “The Impact of Health Claims on Consumer Search and Product Evaluation Outcomes: Results from FDA Experimental Data,” *Journal of Public Policy and Marketing*, 18(1), 89-105.

Russo, J. Edward (1977), “The Value of Unit Price Information,” *Journal of Marketing Research,* 14(2), 193-201.

Shocker, Allan D, Moshe Ben-Akiya, Bruno Boccara, Prakash Nedungadi (1991), “Consideration Set Influences on Consumer Decision-Making and Choice: Issues, Models, and Suggestions,” *Marketing Letters*, 2(3), 181-197.

Sujan, Mita, and Christine Dekleva (1987), “Product Categorization and Inference Making: Some Implications for Comparative Advertising,” *Journal of Consumer Research,* 14(3), 372-378.

Tversky, Amos, and Daniel Kahneman (1981), “The Framing of Decisions and the Psychology of Choice,” *Science*, 211(4481), 453-458.

Wansink, Brian and Pierre Chandon (2006), “Can ‘Low-Fat’ Nutrition Lables Lead to Obesity?” *Journal of Marketing Research,* 43(4), 69-74.

Wright, Peter and Frederick Barbour. (1977). "Phased Decision Strategies: Sequels to Initial Screening," In Martin Starr and Milan Zeleny (eds.). *Multiple Criteria Decision Making.* North Holland TIMS Studies in Management Science. Amsterdam: North Holland, 91-109.

Figures

Figure 1.1: Type-Organized

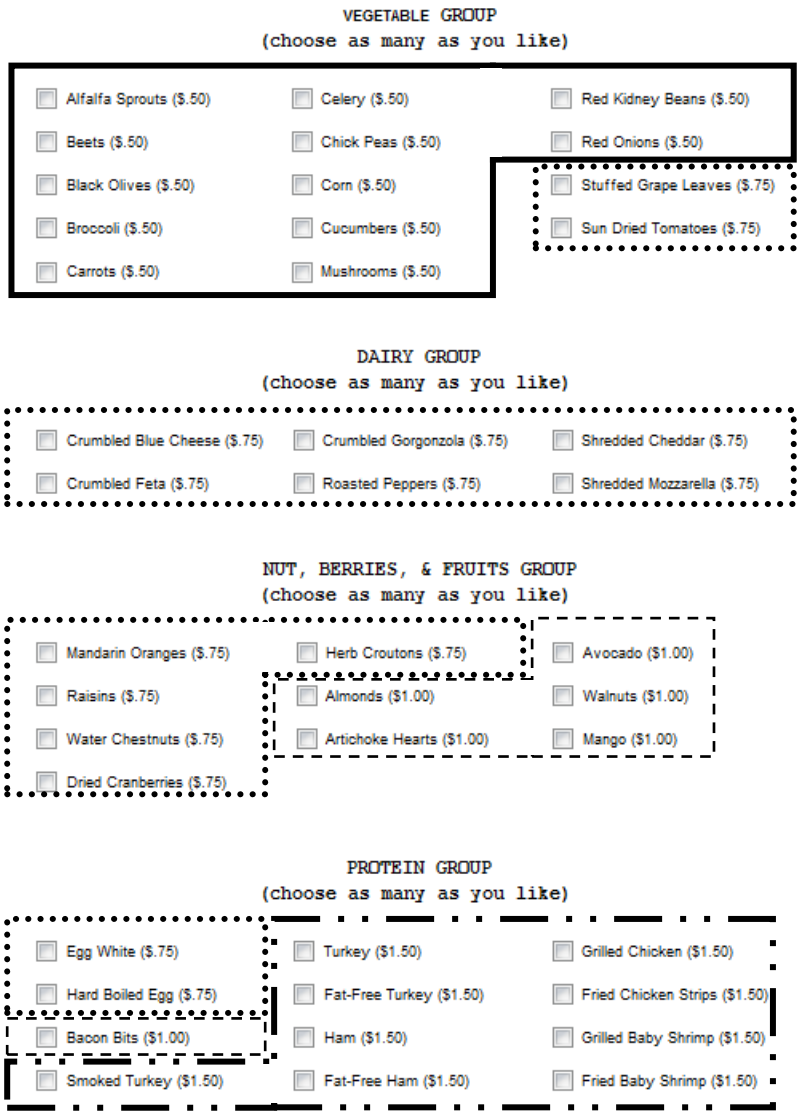


Figure 1.2: Price-Organized

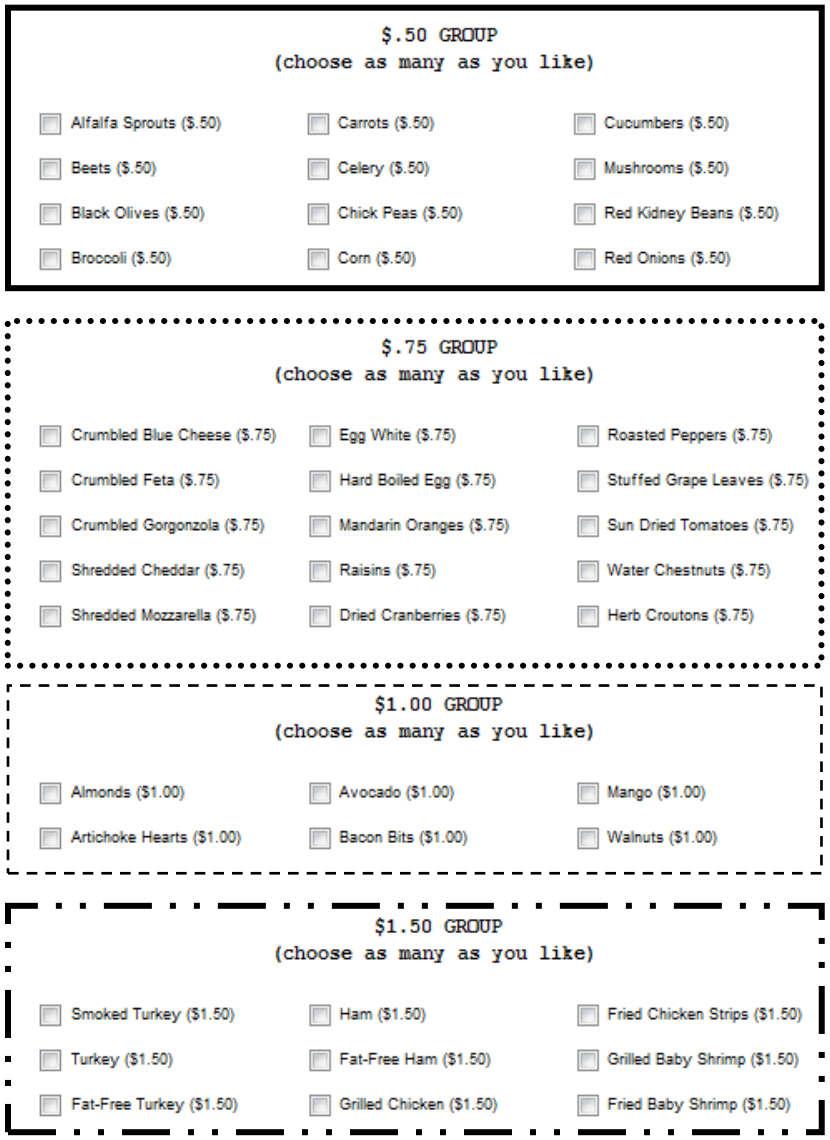


Figure 2.1 – Traditional Menu

Timmy's Diner

Open Daily from 11:00 AM to 11:00 PM

Salads

Boneless Buffalo Chicken Salad
Breaded chicken drenched in medium-spicy buffalo sauce, applewood smoked bacon, blue cheese crumbles, tortilla strips, house-made pico de gallo, and ranch dressing.
$8.79

Quesadilla Explosion Salad
Grilled chicken with cheese, corn relish, cilantro, tortilla strips and citrus-balsamic dressing. Served with cheese quesadillas.
$8.79

Asian Grilled Chicken Salad
Lettuce with Napa cabbage, edamame, green onions, cilantro, sesame seeds, and Asian vinaigrette.
$10.29

Caribbean Grilled Chicken Salad
Fresh Pineapple, mandarin oranges, dried cherries, green onions, cilantro, sesame seeds, and fat free Caribbean Dressing.
$10.29

Sandwiches

Oldtimer Burger w/ French Fries
Mouth-watering burger with mustard and red onion.
$6.99

Ground Peppercorn Burger w/ French Fries
Crusted with ground black pepper and spices, then topped with crispy onion strings and blue cheese dressing.
$7.99

Grilled Chicken Sandwich w/ Grilled Veggies
With applewood smoked bacon, Swiss and honey-mustard dressing on a sesame seed or wheat bun.
$9.59

Santa Fe Chicken Wrap w/ Grilled Veggies
With fire-roasted corn, tortilla strips, cheddar, avocado and tomatoes. Served with ancho-chile ranch.
$9.49

Platters

Classic Sirloin Steak w/ Rice & Veggies
100% USDA Choice 8 oz. sirloin. With a carne asada rub, grilled veggies and Spanish rice.
$13.79

Cajun Pasta w/ Grilled Chicken
Penne Pasta with creamy garlic Alfredo sauce with Cajun spices.
$9.79

Crispy Honey-Chipotle Chicken Crispers
Tossed in our honey-chipotle sauce. Served with corn on the cob, homestyle fries, and ranch dressing
$8.89

Margarita Grilled Chicken w/ Rice & Beans
Classic Margarita-flavored grilled chicken with hints of lime and citrus, served with rice, black beans, tortilla strips and house-made pico de gallo.
$11.59

Grilled Salmon w/ Garlic & Herbs
Served with rice pilaf and seasonal veggies.
$13.59

Fried Shrimp w/ Tequila Lime Sauce
Served with homestyle fries, spicy cole slaw, and tequila lime sauce.
$8.59

Drinks

Milkshakes
Chocolate, Vanilla, or Strawberry.
$2.79

Soft Drinks (free refills)
Coke, Diet Coke, Sprite, Sprite Zero.
$1.59

Iced Tea (free refills)
Sweetened or unsweetened.
$1.59

Figure 2.2: Calorie-Posting Menu

Timmy's Diner

Open Daily from 11:00 AM to 11:00 PM

Salads

Boneless Buffalo Chicken Salad
Breaded chicken drenched in medium-spicy buffalo sauce, applewood smoked bacon, blue cheese crumbles, tortilla strips, house-made pico de gallo, and ranch dressing.
$8.79 *Calories: 1150*

Quesadilla Explosion Salad
Grilled chicken with cheese, corn relish, cilantro, tortilla strips and citrus-balsamic dressing. Served with cheese quesadillas.
$8.79 *Calories: 1400*

Asian Grilled Chicken Salad
Lettuce with Napa cabbage, edamame, green onions, cilantro, sesame seeds, and Asian vinaigrette.
$10.29 *Calories: 620*

Caribbean Grilled Chicken Salad
Fresh Pineapple, mandarin oranges, dried cherries, green onions, cilantro, sesame seeds, and fat free Caribbean Dressing.
$10.29 *Calories: 675*

Sandwiches

Oldtimer Burger w/ French Fries
Mouth-watering burger with mustard and red onion.
$6.99 *Calories: 1260*

Ground Peppercorn Burger w/ French Fries
Crusted with ground black pepper and spices, then topped with crispy onion strings and blue cheese dressing.
$7.99 *Calories: 1520*

Grilled Chicken Sandwich w/ Grilled Veggies
With applewood smoked bacon, Swiss and honey-mustard dressing on a sesame seed or wheat bun.
$9.59 *Calories: 610*

Santa Fe Chicken Wrap w/ Grilled Veggies
With fire-roasted corn, tortilla strips, cheddar, avocado and tomatoes. Served with ancho-chile ranch.
$9.49 *Calories: 610*

Platters

Classic Sirloin Steak w/ Rice & Veggies
100% USDA Choice 8 oz. sirloin. With a carne asada rub, grilled veggies and Spanish rice.
$13.79 *Calories: 490*

Cajun Pasta w/ Grilled Chicken
Penne Pasta with creamy garlic Alfredo sauce with Cajun spices.
$8.79 *Calories: 1350*

Crispy Honey-Chipotle Chicken Crispers
Tossed in our honey-chipotle sauce. Served with corn on the cob, homestyle fries, and ranch dressing
$8.89 *Calories: 1950*

Margarita Grilled Chicken w/ Rice & Beans
Classic Margarita-flavored grilled chicken with hints of lime and citrus, served with rice, black beans, tortilla strips and house-made pico de gallo.
$11.59 *Calories: 380*

Grilled Salmon w/ Garlic & Herbs
Served with rice pilaf and seasonal veggies.
$13.59 *Calories: 620*

Fried Shrimp w/ Tequila Lime Sauce
Served with homestyle fries, spicy cole slaw, and tequila lime sauce.
$8.59 *Calories 1050*

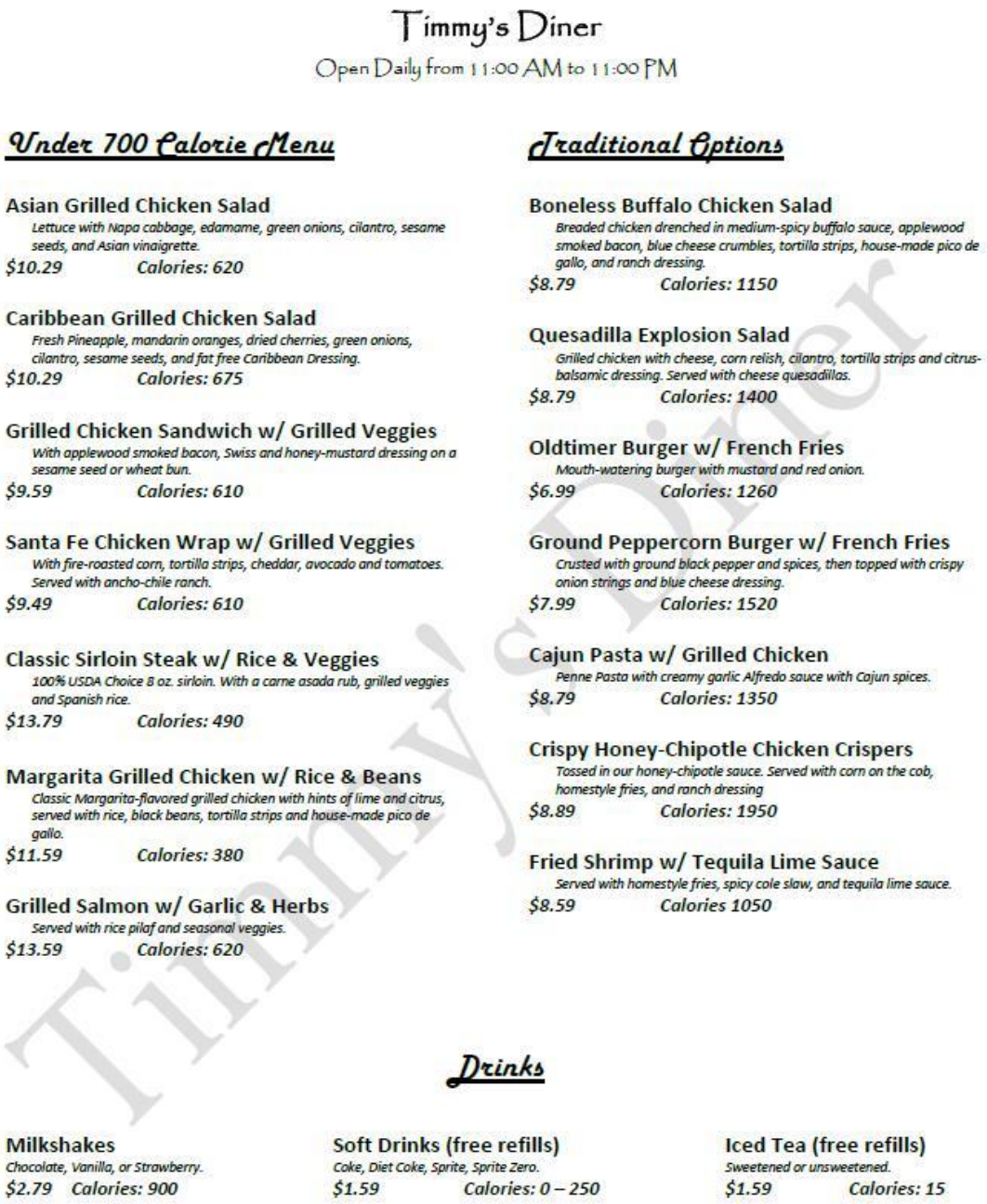
Drinks

Milkshakes
Chocolate, Vanilla, or Strawberry.
$2.79 *Calories: 900*

Soft Drinks (free refills)
Coke, Diet Coke, Sprite, Sprite Zero.
$1.59 *Calories: 0 – 250*

Iced Tea (free refills)
Sweetened or unsweetened.
$1.59 *Calories: 15*

Figure 2.3: Calorie-Organized Menu



Timmy's Diner

Open Daily from 11:00 AM to 11:00 PM

Under 700 Calorie Menu

Asian Grilled Chicken Salad
Lettuce with Napa cabbage, edamame, green onions, cilantro, sesame seeds, and Asian vinaigrette.
$10.29 Calories: 620

Caribbean Grilled Chicken Salad
Fresh Pineapple, mandarin oranges, dried cherries, green onions, cilantro, sesame seeds, and fat free Caribbean Dressing.
$10.29 Calories: 675

Grilled Chicken Sandwich w/ Grilled Veggies
With applewood smoked bacon, Swiss and honey-mustard dressing on a sesame seed or wheat bun.
$9.59 Calories: 610

Santa Fe Chicken Wrap w/ Grilled Veggies
With fire-roasted corn, tortilla strips, cheddar, avocado and tomatoes. Served with ancho-chile ranch.
$9.49 Calories: 610

Classic Sirloin Steak w/ Rice & Veggies
100% USDA Choice 8 oz. sirloin. With a carne asada rub, grilled veggies and Spanish rice.
$13.79 Calories: 490

Margarita Grilled Chicken w/ Rice & Beans
Classic Margarita-flavored grilled chicken with hints of lime and citrus, served with rice, black beans, tortilla strips and house-made pico de gallo.
$11.59 Calories: 380

Grilled Salmon w/ Garlic & Herbs
Served with rice pilaf and seasonal veggies.
$13.59 Calories: 620

Traditional Options

Boneless Buffalo Chicken Salad
Breaded chicken drenched in medium-spicy buffalo sauce, applewood smoked bacon, blue cheese crumbles, tortilla strips, house-made pico de gallo, and ranch dressing.
$8.79 Calories: 1150

Quesadilla Explosion Salad
Grilled chicken with cheese, corn relish, cilantro, tortilla strips and citrus-balsamic dressing. Served with cheese quesadillas.
$8.79 Calories: 1400

Oldtimer Burger w/ French Fries
Mouth-watering burger with mustard and red onion.
$6.99 Calories: 1260

Ground Peppercorn Burger w/ French Fries
Crusted with ground black pepper and spices, then topped with crispy onion strings and blue cheese dressing.
$7.99 Calories: 1520

Cajun Pasta w/ Grilled Chicken
Penne Pasta with creamy garlic Alfredo sauce with Cajun spices.
$8.79 Calories: 1350

Crispy Honey-Chipotle Chicken Crispers
Tossed in our honey-chipotle sauce. Served with corn on the cob, homestyle fries, and ranch dressing
$8.89 Calories: 1950

Fried Shrimp w/ Tequila Lime Sauce
Served with homestyle fries, spicy cole slaw, and tequila lime sauce.
$8.59 Calories 1050

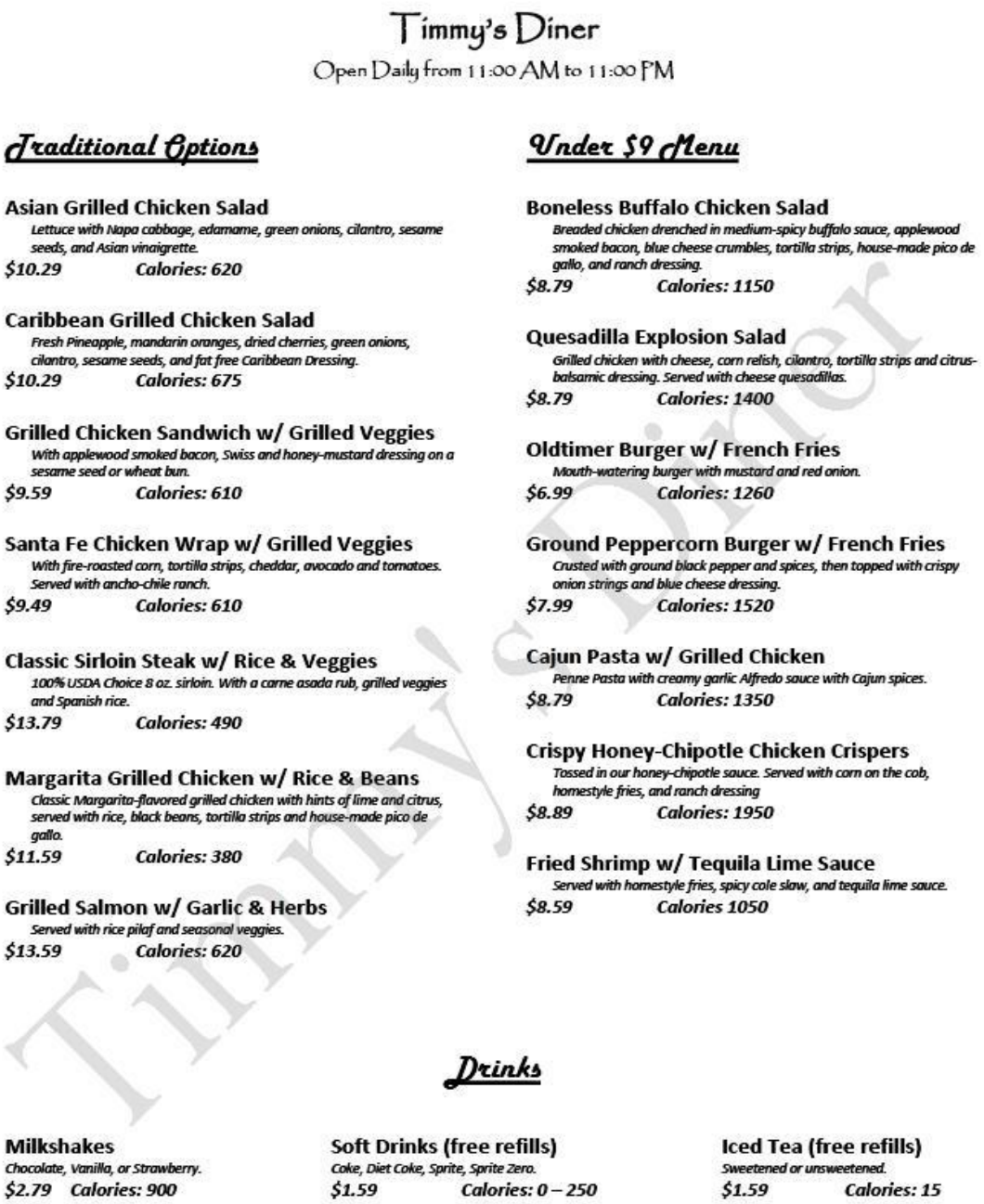
Drinks

Milkshakes
Chocolate, Vanilla, or Strawberry.
$2.79 Calories: 900

Soft Drinks (free refills)
Coke, Diet Coke, Sprite, Sprite Zero.
$1.59 Calories: 0 – 250

Iced Tea (free refills)
Sweetened or unsweetened.
$1.59 Calories: 15

Figure 2.4: Price-Organized Menu



Timmy's Diner

Open Daily from 11:00 AM to 11:00 PM

Traditional Options

Asian Grilled Chicken Salad
Lettuce with Napa cabbage, edamame, green onions, cilantro, sesame seeds, and Asian vinaigrette.
$10.29 *Calories: 620*

Caribbean Grilled Chicken Salad
Fresh Pineapple, mandarin oranges, dried cherries, green onions, cilantro, sesame seeds, and fat free Caribbean Dressing.
$10.29 *Calories: 675*

Grilled Chicken Sandwich w/ Grilled Veggies
With applewood smoked bacon, Swiss and honey-mustard dressing on a sesame seed or wheat bun.
$9.59 *Calories: 610*

Santa Fe Chicken Wrap w/ Grilled Veggies
With fire-roasted corn, tortilla strips, cheddar, avocado and tomatoes. Served with ancho-chile ranch.
$9.49 *Calories: 610*

Classic Sirloin Steak w/ Rice & Veggies
100% USDA Choice 8 oz. sirloin. With a carne asada rub, grilled veggies and Spanish rice.
$13.79 *Calories: 490*

Margarita Grilled Chicken w/ Rice & Beans
Classic Margarita-flavored grilled chicken with hints of lime and citrus, served with rice, black beans, tortilla strips and house-made pico de gallo.
$11.59 *Calories: 380*

Grilled Salmon w/ Garlic & Herbs
Served with rice pilaf and seasonal veggies.
$13.59 *Calories: 620*

Under $9 Menu

Boneless Buffalo Chicken Salad
Breaded chicken drenched in medium-spicy buffalo sauce, applewood smoked bacon, blue cheese crumbles, tortilla strips, house-made pico de gallo, and ranch dressing.
$8.79 *Calories: 1150*

Quesadilla Explosion Salad
Grilled chicken with cheese, corn relish, cilantro, tortilla strips and citrus-balsamic dressing. Served with cheese quesadillas.
$8.79 *Calories: 1400*

Oldtimer Burger w/ French Fries
Mouth-watering burger with mustard and red onion.
$6.99 *Calories: 1260*

Ground Peppercorn Burger w/ French Fries
Crusted with ground black pepper and spices, then topped with crispy onion strings and blue cheese dressing.
$7.99 *Calories: 1520*

Cajun Pasta w/ Grilled Chicken
Penne Pasta with creamy garlic Alfredo sauce with Cajun spices.
$8.79 *Calories: 1350*

Crispy Honey-Chipotle Chicken Crispers
Tossed in our honey-chipotle sauce. Served with corn on the cob, homestyle fries, and ranch dressing
$8.89 *Calories: 1950*

Fried Shrimp w/ Tequila Lime Sauce
Served with homestyle fries, spicy cole slaw, and tequila lime sauce.
$8.59 *Calories 1050*

Drinks

Milkshakes
Chocolate, Vanilla, or Strawberry.
$2.79 *Calories: 900*

Soft Drinks (free refills)
Coke, Diet Coke, Sprite, Sprite Zero.
$1.59 *Calories: 0 – 250*

Iced Tea (free refills)
Sweetened or unsweetened.
$1.59 *Calories: 15*

Figure 2.5: Caloric Content of Selected Dishes by Condition

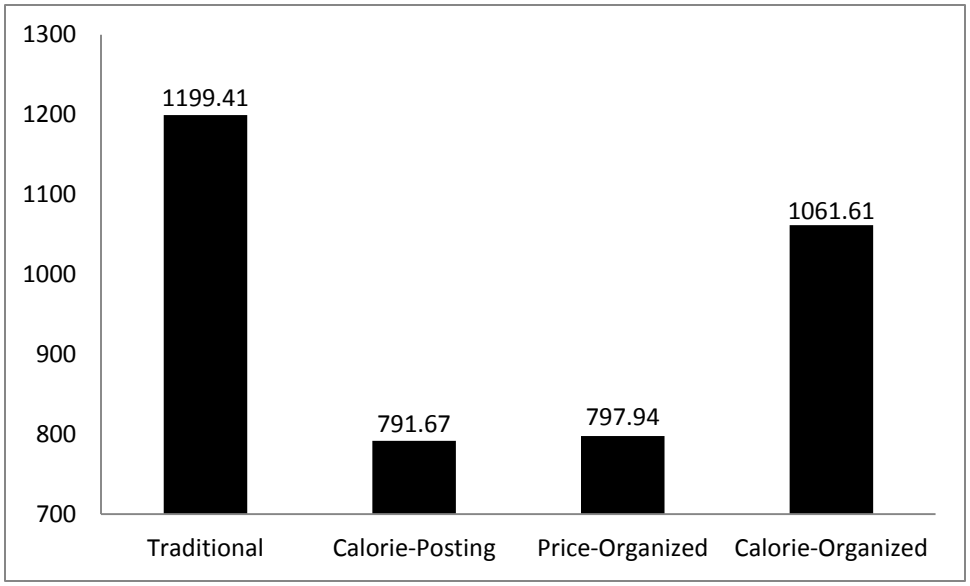


Figure 3.1: Calorie-Posting and Calorie-Organized Menu

Figure 3.2: Calorie-Posting and NOT Calorie-Organized Menu

Figure 3.3: NO Calorie-Posting and Calorie-Organized Menu

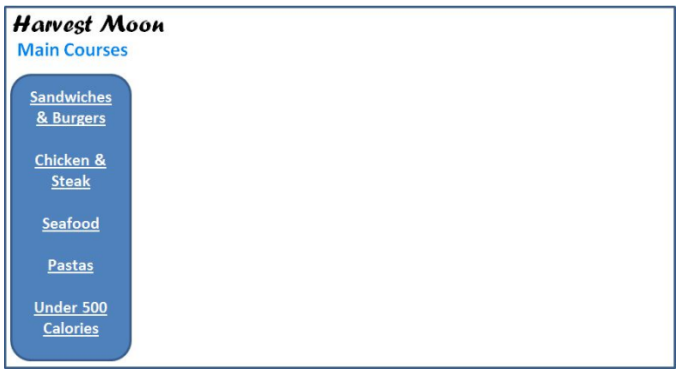


Figure 3.4: NO Calorie-Posting and NOT Calorie-Organized Menu

Harvest Moon
Main Courses

Sandwiches & Burgers
Chicken & Steak
Seafood
Pastas
House Favorites

Harvest Moon
Main Courses

Sandwiches & Burgers

Philly Cheese Steak Sandwich $11.99
Thin-sliced prime sirloin steak, grilled peppers and onions topped with provolone cheese on a fresh toasted hoagie, served w/ French fries

Grilled Chicken Sandwich $10.99
Grilled chicken breast topped with fried onion strings, Swiss cheese, honey mustard, lettuce and tomato, on an onion roll, served w/ French fries

Turkey Club Sandwich $11.99
Triple-stacked sandwich with layers of fat-free turkey, fat-free ham, and turkey bacon, lettuce, tomato, and low-fat chipotle mayo, served w/ fresh veggies

Bacon Cheeseburger $12.99
½ pound ground sirloin patty, topped with aged cheddar and apple-wood smoked bacon on brioche, w/ lettuce and tomato on the side, served w/ French Fries

Harvest Moon
Main Courses

Chicken & Steak

Fried Chicken Platter $13.99
Buttermilk batter w/ our own blend of spices cover three large pieces of free range white meat chicken, served w/ mashed potatoes and gravy and green beans

Broiled Chicken Platter $14.99
Broiled chicken breast coated in our signature 7 herbs & spices mix, fresh grilled veggies and a whole wheat roll

New York Strip Steak $15.99
12 oz. cut, topped with a garlic herb melted butter sauce, served w/ a loaded baked potato and green beans

Porterhouse Steak $17.99
17 oz. cut, dry-aged, marinated for 24 hours, and seared to perfection, served w/ fresh grilled veggies, French fries, and a whole wheat roll

Harvest Moon
Main Courses

Seafood

Fried Jumbo Shrimp Platter $12.99
Fresh jumbo shrimp (ordered daily), beer-battered and deep fried, served w/ Cajun dipping sauce, a mini corn on the cob, and French fries

Beer Battered Fish & Chips $10.99
Traditional pub-style fish and chips: beer battered-cod, deep fried, served w/ French fries (chips!), tartar sauce and fresh lemon wedges

Blackened Baked Salmon $13.99
Fresh Atlantic salmon, blackened with Cajun spices, served w/ New Orleans dirty rice and fresh grilled veggies

Parmesan Crusted Halibut $12.99
Alaskan Halibut (flown in daily), crusted in a garlic herb parmesan mixture and baked, served with classic Italian risotto

Harvest Moon
Main Courses

Pastas

Spaghetti w/ Meatballs $10.99
The classic Italian dish with homemade pasta and meatballs, served in a classic marinara sauce with a dusting of parmesan cheese

Pasta Primavera $12.99
Our homemade rigatoni pasta, tossed in a light pesto sauce with fresh veggies and a touch of parmesan

Fettuccine Alfredo $11.99
The classic pasta, tossed in garlic Alfredo sauce and grilled chicken, served w/ a side of garlic bread.

Spicy Sausage Ravioli $13.99
Jumbo ravioli, stuffed with spicy Italian sausage and topped with our spicy marinara sauce, served w/ a side of garlic bread

Harvest Moon
Main Courses

House Favorites

All-American Cheeseburger $11.99
½ pound ground sirloin patty, topped with Swiss, Cheddar, and American cheeses, lettuce, tomato, on a sesame seed bun, served w/ French fries

Country Fried Steak $14.99
10 ounces of round steak, pounded thing, battered in our buttermilk batter, deep fried, covered with white gravy, served w/ French fries

Fried Catfish Dinner $13.99
Fresh caught catfish, seasoned in a Cajun batter, and deep fried, served w/ traditional hush puppies and a side of coleslaw

Traditional Meat Lasagna $12.99
Layers upon layers of fresh pasta, spiced ground meat, mozzarella cheese, and classic marinara sauce, served w/ a side of garlic bread

Figure 3.5: Caloric Content of Selected Dishes by Condition

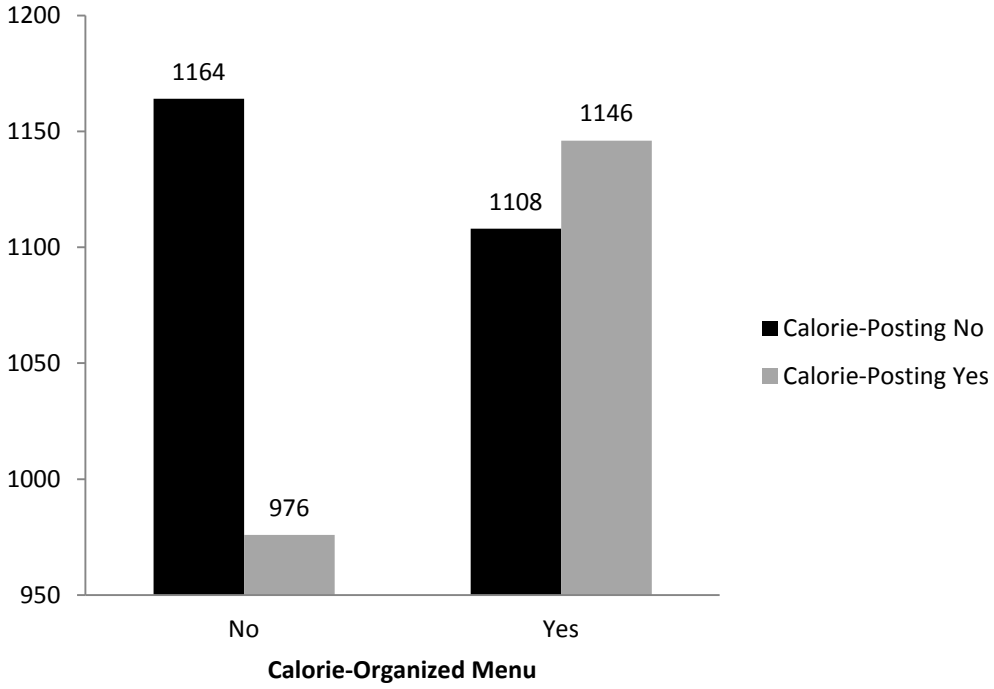


Figure 3.6: Caloric Content of Selected Dishes by Condition