EFFECTS OF PROVIDING SODIUM INFORMATION ON A RESTAURANT MENU: A CASE STUDY FROM THE RESTAURANT AT KELLOGG RANCH (RKR)

A Project
Presented to the
Faculty of
California State Polytechnic University, Pomona

In Partial Fulfillment
Of the Requirements for the Degree
Master of Science
In
Hospitality Management

By
Pei Yu Lin
2016
ABSTRACT

As people have become increasingly health conscious, health labeling on menus has become more important for both restaurants and customers. Customers have a much greater knowledge of the connection between excessive sodium intake and health issues. The aim of this study is to determine whether providing sodium information on restaurant menus effects customers’ meal choices. By using Chi-square analysis, this study compared the differences in the number of orders from the dinner menu on which the sodium content was labeled and the number of orders from the menu without the sodium content labeled. The mixed results show that providing sodium information on the menu effected the number of orders customers made on some of the menu items and some menu items it did not effect.

Keywords: restaurant, sodium, menu selection, health issues, labeling.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature Page</td>
<td>ii</td>
</tr>
<tr>
<td>Abstract</td>
<td>iii</td>
</tr>
<tr>
<td>List of Tables</td>
<td>iv</td>
</tr>
<tr>
<td>List of Figures</td>
<td>vi</td>
</tr>
<tr>
<td>Chapter 1: Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Purpose of the Study</td>
<td>3</td>
</tr>
<tr>
<td>Introduction to the Restaurant at Kellogg Ranch (RKR)</td>
<td>4</td>
</tr>
<tr>
<td>Chapter 2: Literature Review</td>
<td>5</td>
</tr>
<tr>
<td>Nutrition Labeling on Restaurant Menus</td>
<td>6</td>
</tr>
<tr>
<td>Low-Sodium</td>
<td>12</td>
</tr>
<tr>
<td>Chapter 3: Methodology</td>
<td>19</td>
</tr>
<tr>
<td>Menu Collection</td>
<td>19</td>
</tr>
<tr>
<td>Nutrition Analysis and Menu Labeling</td>
<td>19</td>
</tr>
<tr>
<td>Study Design and Data Collection</td>
<td>20</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>21</td>
</tr>
<tr>
<td>Chapter 4: Findings</td>
<td>22</td>
</tr>
<tr>
<td>Chapter 5: Discussion</td>
<td>41</td>
</tr>
<tr>
<td>Chapter 6: Conclusion</td>
<td>46</td>
</tr>
<tr>
<td>Implications &amp; Applications</td>
<td>47</td>
</tr>
<tr>
<td>Limitations &amp; Suggestion for Future Research</td>
<td>49</td>
</tr>
<tr>
<td>References</td>
<td>52</td>
</tr>
</tbody>
</table>
**LIST OF TABLES**

Table 1  Descriptive Statistics of Menu Items .......................................................... 23

Table 2  Comparison the Order Numbers between With and Without Sodium Label on Dish 1 (Caprese Salad) ............................................................... 25

Table 3  Comparison the Order Numbers between With and Without Sodium Label on Dish 2 (Shellfish vol-au-vent) ............................................................ 26

Table 4  Comparison the Order Numbers between With and Without Sodium Label on Dish 3 (Bistro Salad) ................................................................. 27

Table 5  Comparison the Order Numbers between With and Without Sodium Label on Dish 4 (Pate Maison) ............................................................... 28

Table 6  Comparison the Order Numbers between With and Without Sodium Label on Dish 5 (French Onion Soup) ....................................................... 29

Table 7  Comparison the Order Numbers between With and Without Sodium Label on Dish 6 (Lemon Crusted Sea Bass) ............................................. 31

Table 8  Comparison the Order Numbers between With and Without Sodium Label on Dish 7 (Chicken Provencal) ..................................................... 32

Table 9  Comparison the Order Numbers between With and Without Sodium Label on Dish 8 (Grilled Vegetable Lasagna) ........................................ 33

Table 10 Comparison the Order Numbers between With and Without Sodium Label on Dish 9 (Cassoulet) ................................................................. 34

Table 11 Comparison the Order Numbers between With and Without Sodium Label on Dish 10 (Braised Beef Short Rib) ............................................. 35

Table 12 Comparison the Order Numbers between With and Without Sodium Label on Dish 11 (Apple Crisp) ............................................................... 36

Table 13 Comparison the Order Numbers between With and Without Sodium Label on Dish 12 (Chocolate Espresso Pot De Crème) ............................... 37

Table 14 Comparison the Order Numbers between With and Without Sodium Label on Dish 13 (Pumpkin Spice Cake) .................................................... 38
Table 15  Comparison the Order Numbers between With and Without Sodium Label on Dish 14 (Dr. Bob’s Profiteroles) .................................................. 39

Table 16  Comparison the Order Numbers between With and Without Sodium Label on Dish 15 (California Cheese Plate) ................................................. 40
LIST OF FIGURES

Figure 1  Sodium Content of Food Groups Per 100 g................................................. 14
Figure 2  Canned Green Beans versus Fresh Green Beans...................................... 18
Figure 3  Hamburger versus Hamburger with Sauces.............................................. 18
CHAPTER 1
INTRODUCTION

There is growing public health concern regarding the high intake of sodium and the consequences of consuming too much sodium in the United States. According to Marissa Harshman, in the Columbian Health Report (2014), 90 percent of adults eat more sodium than the percent recommended for a healthy diet. In 2010, the Dietary Guidelines Advisory Committee recommended that the sodium content of food in the marketplace be deliberately and immediately reduced to help consumers decrease their daily sodium intake to less than 2,300 mg, aiming for an ultimate target intake of 1,500 mg (DeSimone, Beauchamp, Drewnowski & Johnson, 2013). Based on the 2010 dietary guidelines, the vast majority of American adults eat more sodium than they should. They average more than 3,300 mg per day (CDC, 2012).

In response to the growing obesity epidemic and the popularity of dining out, nutrition labeling on restaurant menus is a policy that has been implemented to help people make healthier choices when eating out. Several jurisdictions have enacted menu-labeling laws in the United States, and in Canada, there have been several successful cases at both the provincial and federal level. Last year, Toronto Public
Health strongly recommended legislation requiring the mandatory reporting of calorie content and sodium information in large restaurant chains (Scourboutakos, Corey, Mendoza, Henson & L’abbé, 2014). Thus, providing nutritional information on menus has become popular and often mandatory for the restaurant industry in recent years. The importance of listing sodium information has been a major topic in the field of nutrition. Recent research on the nutritional quality of restaurant food has demonstrated that sodium levels are surprisingly higher than previously thought and that there is a wide range of sodium levels present in similar foods (Adrogué & Madias, 2008; Cook, Obarzanek, Cutler, etc., 2009). This is cause for concern because dietary sodium is the leading preventable risk factor for hypertension, which is the leading risk factor for death worldwide (Garretson & Burton, 2013). A high sodium intake is also responsible for an increased risk of cardiovascular and renal disease.
Purpose of the Study

This study is designed to determine whether customers’ menu choices are effected when sodium information for menu items is provided on the dinner menu at the Restaurant of Kellogg Ranch (RKR). Given the adverse effects of a high-sodium diet on Americans health, this study investigates whether customers would choose lower-sodium menu items if the sodium information was listed for each item on the menu.
Introduction to the Restaurant at Kellogg Ranch (RKR)

The RKR is run by The Collins College of Hospitality Management’s students, and it is open to the public for lunch and dinner. The RKR customers during the dinner meal service are 56 percent friends and family members of students in the class operating the restaurant and the College, 20 percent Cal Poly Pomona community, and 14 percent repeat customers. The customers’ ages range from students around 20 years old to people around 65 years old. The majority of diners visiting the RKR for dinner are 45 years and over.
CHAPTER 2

LITERATURE REVIEW

The 2010 Dietary Guidelines for Americans recommend that daily sodium intake should be less than 2,300 mg. The World Health Organization (2013) recommends a worldwide reduction of sodium intake to less than 2,000 mg per day. The Dietary Guidelines further recommend reducing sodium intake to 1,500 mg if an individual is 51 years or older or African American. Additionally, anyone who has hypertension, diabetes, or chronic kidney disease is advised to consume no more than 1,500 mg of sodium a day. The 1,500 mg recommendation applies to approximately half of the U.S. population, including children (DeSimone, Beauchamp, Drewnowski & Johnson, 2013). Recent data indicates Americans consume approximately 3,400 mg of sodium per day (CDC, 2012). This exceeds the recommended intake levels set by various health organizations. Approximately 90 percent of the sodium consumed in the United States comes from processed and manufactured foods or from sodium that is naturally present in foods (Andersen, Rasmussen, Larsen & Jakobsen, 2009).
Bruemmer, Krieger, Saelens, and Chan (2012) conducted several studies after regional regulations were passed to examine the effects and implications of energy, saturated fat and sodium labels on restaurant menus. The results showed that although many restaurants in King County, state of Washington, especially sit-down restaurants, improved the overall nutritional profile of their menu items—including the calories, saturated fat, and sodium—the sodium content still greatly exceeded the recommendations of the 2010 Dietary Guidelines for Americans.

**Nutrition Labeling on Restaurant Menus**

There is general support for menu labeling among consumers (Kim & Almanza, 2001). Approximately one half of US chain restaurants provide nutrition information publicly either on menus or on websites. However, this information is often not prominently displayed and goes mostly unnoticed by consumers (Wootan & Osborn, 2006). In addition, many state and local governments have considered requiring restaurants to label their menus with nutrition information (Pulos & Leng, 2010). However, evidence from a 2006 study suggests that the effects of menu labeling on changing food selection or consumption are inconclusive (Wootan & Osborn, 2006).
Americans get one-third of their calories from eating and drinking outside the home.

Providing calorie information on chain restaurant menus will help customers to make informed menu choices for themselves and their families. The FDA’s final rule for nutrition labeling in chain restaurants and similar retail food establishments will provide consumers with clear and consistent nutrition information in a direct and accessible manner for the foods they eat and buy for their families in these operations.

Putting calories information on chain restaurant menus and making other nutrition information available to the customers will help customers obtain nutrition information about their food and enable them to make better and healthier dietary choices. Covered establishments will provide detail calorie information of the items on their menus and menu boards, and a brief statement with the suggested daily calorie intake will be provided as well. Other nutrient information - total calories, calories from fat, total fat, saturated fat, trans fat, cholesterol, sodium, total carbohydrates, fiber, sugars, and protein will need to be available to customer upon the request.
Nutrition Labels

Over the past decade, there has been an increasing focus on calorie intake to control obesity and other health problems. Many existing chain restaurants including McDonald’s, Burger King, Subway, Panera, Taco Bell, and Wendy’s, have since provided calorie information and information on other nutrients on their menu boards.

In some states and cities, such as New York City, San Francisco, and King County in Washington State, similar menu nutrition labeling regulations were accepted before the federally proposed rules were published (Rutkow, Vernick, Hodge Jr. & Teret, 2008).

Customers’ Perception of Restaurant Nutrition Information

Providing nutrition information can be beneficial to both consumers and restaurateurs. Recent studies have used a quantitative approach to investigate the effect of providing health information on restaurant menus (Burton & Creyer, 2004; Burton, Creyer, Kees, &Juggins, 2006). Kozup et al. (2003) conducted a study that examined the influence of including health information on menus on food selection.

The further studies indicate that consumers, and even nutrition professionals, are
unable to accurately estimate the calorie or other nutrient content of popular restaurant foods (Technomic, 2008; Kozup et al., 2003; CCPHA, 2007; Wansink & Chandon, 2007).

According to Jones (2009), including health labels and nutritional information on menus did influence customers’ choices. Those restaurants that provided health and nutrition information on menus were likely to benefit from including the information as long as any health claims that were made were substantiated. Cranage, Conklin, and Lambert (2004) reached a similar conclusion about the positive benefits of providing health information to restaurant customers. Other restaurants that are willing to provide this information at the point of sale can lead to higher customer satisfaction and positive feedback about the quality of the foods, and to the intention to revisit and repurchase food (Chu, Frongillo, Jones & Kaye, 2009).

Using the example of calorie labels on restaurant menus, from August 2007 to 2008, the impact of menu labeling on food choices and intake of 300 American participants was evaluated. The result was that calorie information on restaurant menus reduced the total amount of calories that people ordered and consumed in a
meal and improved their ability to estimate the calories consumed per meal (Roberto, Larsen, Agnew, Bail & Brownell, 2010).

**Factors Influencing Customers’ Choices When Provided with Nutrition Information on Menus**

Many complex factors can affect people’s eating behaviors, such as customers’ specific food habits, understanding of nutrition values, knowledge of nutrition information, health concerns, and the desire to eat healthier food. These factors vary among individuals at different times and under different conditions (Mela, 1999; Nestle, Wing, Birch, DiSogra, Drewnowski, Middleton, Sigman-Grant, Sobal, Winston & Economos, 1998).

Customers’ specific food habits are related to behavioral and social influences on food choice as well as eating norms. According to the theory of planned behavior (TPB), “people’s expectation about the consequences of performing a given behavior and the evaluation of these consequences (attitude), people’s perceived social pressure to perform or not perform a certain behavior (subjective norm), and people’s
perceived difficulty of performing a given behavior (perceived behavior control) can determine behavioral intentions” (Gi, Behnke, Almanza, 2014).

In addition, customers’ understanding of nutrition values can directly influence their food selection. According to Roberto, Larsen, Agnew, Baik, and Brownell’s study (2010), calorie information on restaurant menus reduced the total amount of calories customers ordered and consumed in a meal, and improved consumers’ ability to estimate calories consumed per day. Therefore, using the example of calorie information on restaurant menus, understanding nutrition values impacts the food choices of the majority of people to a certain extent.

Moreover, customers’ knowledge of nutrition information is one of the key elements of food selection (Lachat, Nago, Verstraeten, Roberfroid, Camp, & Kolsteren, 2012). Nutrition information including calories from fat, total fat, saturated fat, cholesterol, trans fat, sodium, total carbohydrates, sugars, dietary fiber and protein should also be made available to consumers on restaurant menus (Homes, Serrano, Machin, Duetsch & Davis, 2013). Access to this nutrition information may help to
decrease the intake of unhealthy or processed foods. The consequences of over-
consuming these nutrients may cause health problems.

Finally, people who do have basic nutrition knowledge can analyze the nutrition information labels on restaurant menus to make healthy food choices and fulfill their desire to eat healthier foods.

**Low- Sodium**

Many people confuse sodium and salt and assume that they are the same. Sodium chloride is the chemical name for dietary salt. Approximately 90 percent of the sodium we consume is in the form of salt. Although the words “salt” and “sodium” are not the same, consumers and manufacturers often use them interchangeably (HEALTHY SHASTA, 2011).

**Definition of Sodium**

The natural sodium levels in foods generally account for approximately 10 percent of dietary intake. Most dietary sodium is ingested in the form of sodium chloride, hereafter referred to as “salt” (Dolye & Glass, 2010). Sodium is required for life, but the human body does not efficiently store excessive sodium; it must be
consumed at different meals, not all at once. Sodium influences “not only the flavor
profile of food products, but also their texture, and it plays an important role in the
preservation of foods against microbes” (Kremer, Mojet, & Shimojo, 2009). Most of
the sodium, 77 percent, we eat comes from sodium added to processed foods and
restaurant foods (Mattes & Donnelly, 1991). Twelve percent comes from naturally
occurring sources, 6 percent is added while eating, and 5 percent is added while

A study by DeSimone, Beauchamp, Drewnowski, and Johnson (2013) was based
on sodium content per 100 grams (3.527 oz). The items that contained the most
sodium included processed meats, seafood, bacon, processed cheese, and salad
dressings (Figure 1). However, many other foods are typically consumed in portion
sizes that are significantly smaller than 100 grams (3.527 oz.). The FDA’s (Food and
Drug Administration) definition of portion size is based on reference amounts that
individuals customarily consumed, and these amounts vary from 15 grams (0.529
oz.) for bacon to 240 grams (8.466 oz.) for milk.
Health Issues Related to Sodium

Excessive sodium intake may lead to the development of hypertension in some individuals, which increases cardiovascular disease risk. Additionally, Doyle & Glass’ study (2013) found that increased sodium intake could cause hypertension, and that untreated hypertension is associated with increased incidence of diabetes, heart disease, stroke, and kidney disease (Doyle & Glass, 2010). Therefore, it has been recommended that the total amount of dietary salt be maintained at approximately 6 grams (0.212 oz.). per day. Individuals who are genetically predisposed to sodium-related health problems as well as those with hypertension would particularly benefit from a low-sodium diet, in which the salt content is controlled between 1 to 3 grams (0.035 to 0.106 oz.) per day (salt, 2015).
• **Hypertension**

Nearly two-thirds of adults in the United States may have hypertension (Mitchell, Brunton & Wilkinson, 2011). Untreated hypertension can greatly increase the incidence of diabetes, heart disease, stroke, and kidney disease, and these diseases are all associated with excess sodium intake. Therefore, reducing or preventing the development of high blood pressure through interventions would significantly improve health (Dickinson & Havas, 2007).

• **Cardiovascular Disease (CVD)**

Hypertension is a recognized risk factor for CVD and is often associated with other cardiovascular risk factors such as obesity and metabolic syndrome (Hoffmann & Cubeddu, 2009). Higher sodium intake also impairs the relaxation of smooth muscles in the endothelium of the arteries as a reaction to the shear stress of flowing blood. This is another known risk for cardiovascular disease (Dickinson & others, 2009).

Alderman (2006), Walker and others (2007) found that correlations between sodium intake, cardiovascular disease, and mortality are difficult to establish because
the over-intake of sodium is not the only factor that influences cardiovascular diseases. This disease develops over many years and is affected by several dietary variables as well as lifestyle factors. However, the study indicated that a reduction in average salt intake in the population would proportionally lower average blood pressure levels and confer significant public health benefits (Matthews & Strong, 2005).

**Strategies to Decrease Sodium but Maintain Flavor**

Interest in reducing sodium in foods has never been higher among consumers, health professionals, and the food industry. New York City is conducting a National Salt Reduction Initiative (2010) that has established an aim for sodium reduction in 25 categories of restaurant foods and 62 categories of packaged foods to be implemented over the next 2 to 4 years. Melissa Martin, of the health department chronic disease prevention program, also said, “We are really working with restaurants to reduce sodium without sacrificing flavor” (Harshman, 2014).

To reduce sodium but maintain flavor, HEALTH SHASTA (2011) proposed the following professional suggestions: first compare different brands of the same foods
that may have different sodium levels. Second look for products with no added salt or
with reduced sodium as many manufacturers are working to decrease the sodium
content in food items. If the product you are interested in is not available, ask the
distributor for products with no added salt. Finally, always ask your supplier for the
nutritional content of products or compare product labels when available. The
differences in sodium content between fresh ingredients and processed foods are
described below.

- Half a cup of canned green beans with salt has 340 mg of sodium, compared with
  no-salt-added frozen green beans, which have 10 mg, or fresh green beans, which
  have 3 mg (Figure 2).

- Two hamburgers with the same bread, meat, lettuce, and onion are compared as
  follows. A hamburger with mustard, mayonnaise, ketchup, and a pickle has 1,290 mg
  of sodium, compared with a hamburger without mustard, mayonnaise, ketchup, and a
  pickle. It has 575 mg of sodium (Figure 3).
Figure 2

Figure 3

Hamburger with lettuce and onion
575 mg sodium

Hamburger with mustard, mayo, ketchup, and pickle
1,290 mg sodium
CHAPTER 3

METHODOLOGY

Menu Collection

This study was conducted at the Restaurant at Kellogg Ranch (RKR). This table service restaurant is run by students of the Collins College of Hospitality Management. It is located on the campus of California State Polytechnic University, Pomona. The restaurant’s dinner menu offered five appetizers, including a soup and salads; five entrees, including seafood, beef, chicken, and vegetables; and five desserts.

Nutrition Analysis and Menu Labeling

The fifteen dinner items included five appetizers, five entrees, and five desserts. The five appetizers were Caprese Salad, Shellfish vol-au-vent, Bistro Salad, Pâte Maison, and French Onion Soup and the five entrees were Lemon Crusted Sea Bass, Chicken Provencal, Grilled Vegetable Lasagna, Cassoulet, and Braised Beef Short Rib. The desserts were Apple Crisp, Chocolate Espresso Pot de Crème, Pumpkin Spice Cake, a California Cheese Plate, and Dr. Bob’s Profiteroles.

Prior to this study, the nutrition information was not provided on the restaurant’s dinner menu. To determine the nutritional content of each menu item, nutrition analysis
was conducted using the ESHA online nutrition analysis program, product labels, and the nutrition analysis book *Food Values of Portions Commonly Used* (2010). These methods were used to analyze the sodium content of the fifteen menu items on the RKR dinner menu.

According to the 2010 Dietary Guidelines for Americans, the daily sodium intake should be less than 2,300 mg (DGA, 2010). To provide clear sodium nutrition information for each menu item, nutrition labeling formats were developed with mg of sodium and the percentage daily values of sodium by dividing by the average 2,300 mg daily intake.

**Study Design and Data Collection**

This study was conducted during the dinner service in fall quarter 2014, from October 16\(^{th}\) to December 5\(^{th}\). Sodium information was listed for each menu item on the RKR menu for four days and no sodium information was listed for each menu item on the RKR menu for four days. The number of orders of each menu item during each day the menu items was offered with sodium information and each day the menu items were offered without sodium information was collected.
Data Analysis

All data analyses were performed using the Statistical Package for the Social Sciences software (21version). Descriptive statistics were used to summarize the number of orders and the percent daily values on each menu item.

The chi-square test was used to examine independence across two categorical variables. They were the order number of sodium labeled on the RKR dinner menu and the order number of no sodium labeled on the RKR dinner menu. The $X^2$ difference tests for detecting differential functioning compare whether provided sodium labels on RKR dinner menu items will influence customers’ food selection or not. One variable (goodness of fit) is the significant result shows Chi-Square test was performed this hypothesis. A statistical significance of the $X^2$ difference statistic indicates the presence of differential functioning. In a typical DIF (differential item functioning) study, two groups are considered: the order numbers with and without sodium labeled on the RKR dinner menu items.
CHAPTER 4

FINDINGS

Table 1 presents the number of orders for each of the fifteen menu items with and without sodium information listed. Every dish’s sodium milligrams was calculated. The percent daily value of sodium was calculated by dividing the sodium in each menu item by 2,300 mg, which is the average daily number of milligrams of sodium needed per individual (Table 1).
Table 1

*Descriptive statistics of menu items*

<table>
<thead>
<tr>
<th>Menu Items</th>
<th># of Orders With Sodium Info</th>
<th># of Orders Without Sodium Info</th>
<th>Sodium (mg)</th>
<th>Sodium % Daily Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caprese Salad</td>
<td>36</td>
<td>28</td>
<td>81</td>
<td>4</td>
</tr>
<tr>
<td>Shellfish Vol-au-vent</td>
<td>53</td>
<td>44</td>
<td>1015</td>
<td>44</td>
</tr>
<tr>
<td>Bistro Salad</td>
<td>44</td>
<td>30</td>
<td>1057</td>
<td>46</td>
</tr>
<tr>
<td>Pate Maison</td>
<td>12</td>
<td>14</td>
<td>1337</td>
<td>58</td>
</tr>
<tr>
<td>French Onion Soup</td>
<td>53</td>
<td>34</td>
<td>2210</td>
<td>96</td>
</tr>
<tr>
<td>Lemon Crusted Sea Bass</td>
<td>72</td>
<td>44</td>
<td>680</td>
<td>30</td>
</tr>
<tr>
<td>Chicken Provencal</td>
<td>27</td>
<td>26</td>
<td>1120</td>
<td>49</td>
</tr>
<tr>
<td>Grilled Vegetable Lasagna</td>
<td>15</td>
<td>9</td>
<td>1485</td>
<td>65</td>
</tr>
<tr>
<td>Cassoulet</td>
<td>18</td>
<td>31</td>
<td>1730</td>
<td>75</td>
</tr>
<tr>
<td>Braised Beef Short Rib</td>
<td>66</td>
<td>52</td>
<td>2425</td>
<td>105</td>
</tr>
<tr>
<td>Menu Items</td>
<td># of Orders With Sodium</td>
<td># of Orders Without Sodium</td>
<td>Sodium (mg)</td>
<td>Sodium % Daily Value</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-------------------------</td>
<td>----------------------------</td>
<td>-------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Apple Crisp</td>
<td>66</td>
<td>59</td>
<td>77</td>
<td>3</td>
</tr>
<tr>
<td>Chocolate Espresso Pot De Crème</td>
<td>22</td>
<td>33</td>
<td>103</td>
<td>5</td>
</tr>
<tr>
<td>Pumpkin Spice Cake</td>
<td>19</td>
<td>29</td>
<td>302</td>
<td>13</td>
</tr>
<tr>
<td>Dr. Bob's Profiteroles</td>
<td>44</td>
<td>26</td>
<td>314</td>
<td>14</td>
</tr>
<tr>
<td>California Cheese Plate</td>
<td>17</td>
<td>13</td>
<td>1068</td>
<td>46</td>
</tr>
</tbody>
</table>

The number of orders of menu items listed with and without sodium was compared using nonparametric tests and Chi-square statistic. The Chi-square tests revealed significant differences between the number of menu items ordered with and without sodium listed on the RKR dinner menu. Table 2 shows the difference in the number of orders of the Caprese Salad with and without sodium information listed. There was no statistically significant difference in the number of orders between the
days on which sodium content was listed on the menu and those on which no sodium content was listed. At the $\alpha = 0.05$ level, $X^2 (1) = 0.085$, $p > 0.1$ (significant = 0.771, > 0.1). Therefore, the results of this test indicated customers’ food selections were not significantly associated with the sodium content information provided on the restaurant menu. The sales of Caprese Salad were not affected by the sodium content information provided on the restaurant menu (Table 2).

Table 2

*Comparison the Order Numbers between With and Without Sodium Label on dish 1 (Caprese Salad)*

<table>
<thead>
<tr>
<th>Nutrient</th>
<th># of Orders Without Sodium Info</th>
<th># of Orders With Sodium Info</th>
<th>Test</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>28</td>
<td>36</td>
<td>0.085</td>
<td>1</td>
<td>0.771</td>
</tr>
</tbody>
</table>

25
Table 3 shows the difference in the number of orders of the Shellfish Vol-au-vent with and without sodium information listed. There was no statistically significant difference in Shellfish Vol-au-vent order numbers between the days on which sodium content was listed on the menu and those on which no sodium content was listed. At the $\alpha = 0.05$ level, $X^2 (1) = 0.002$, $p > 0.1$ (significant = 0.969, $> 0.1$). Therefore, the results of the chi-square test indicated that customers’ food selections were not significantly associated with the sodium content information provided on Shellfish Vol-au-vent.

Table 3

*Comparison the Order Number between With and Without Sodium Label on dish 2 (Shellfish Vol-au-vent)*

<table>
<thead>
<tr>
<th>Nutrient</th>
<th># of Orders Without Info</th>
<th># of Orders With Sodium Info</th>
<th>Test</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>44</td>
<td>53</td>
<td>0.002</td>
<td>1</td>
<td>0.969</td>
</tr>
</tbody>
</table>

26
Table 4 shows there was no statistically significant difference in the number of orders of the Bistro Salad between the days on which sodium content was listed on the menu and those on which no sodium content was listed. At the $\alpha = 0.05$ level, $X^2 (1) = 0.752$, $p > 0.1$ (significant = 0.386, > 0.1). Therefore, the results of this test indicated customers’ food selections were not significantly associated with the sodium content information provided on Bistro Salad (Table 4).

Table 4

*Comparison the Order Numbers between With and Without Sodium Label on dish 3 (Bistro Salad)*

<table>
<thead>
<tr>
<th>Nutrient</th>
<th># of Orders Without Sodium Info</th>
<th># of Orders With Sodium Info</th>
<th>Test Value</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>30</td>
<td>44</td>
<td>0.752</td>
<td>1</td>
<td>0.386</td>
</tr>
</tbody>
</table>

27
Table 5 shows there was no statistically significant difference in number of orders of the Pate Maison between the days on which sodium content was listed on the menu and those on which no sodium content was listed. At the $\alpha = 0.05$ level, $X^2 (1) = 0.004$, $p > 0.1$ (significant = 0.952, $> 0.1$). Therefore, the results of this test indicated customers’ food selections were not significantly associated with the sodium content information provided on Pate Maison (Table 5).

Table 5

*Comparison the Order Numbers between With and Without Sodium Label on dish 4 (Pate Maison)*

<table>
<thead>
<tr>
<th>Nutrient</th>
<th># of Orders Without</th>
<th># of Orders With Sodium</th>
<th>Test</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>14</td>
<td>12</td>
<td>0.004</td>
<td></td>
<td>0.952</td>
</tr>
</tbody>
</table>

28
Table 6 shows there was no statistically significant difference in French Onion Soup’s order numbers between the days on which sodium content was listed on the menu and those on which no sodium content was listed. At the $\alpha = 0.05$ level, $X^2 (1) = 1.473$, $p > 0.1$ (significant = 0.225, $> 0.1$). Therefore, the results of this test indicated customers’ food selections were not significantly associated with the sodium content information provided on French Onion Soup (Table 6).

Table 6

Comparison the Order Numbers between With and Without Sodium Label on dish 5

(French Onion Soup)

<table>
<thead>
<tr>
<th>Nutrient</th>
<th># of Orders Without</th>
<th># of Orders With Sodium</th>
<th>Test</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Info</td>
<td>34</td>
<td>53</td>
<td>1.473</td>
<td>1</td>
<td>0.225</td>
</tr>
</tbody>
</table>

29
Table 7 shows there was statistically significant difference in the number of orders of the Lemon Crusted Sea Bass between the days on which sodium content was listed on the menu and those on which no sodium content was listed. At the $\alpha = 0.05$ level, $X^2(1) = 2.722$, $p < 0.1$ (significant = 0.099, < 0.1). Therefore, the results of this test indicated customers’ food selections were significantly associated with the sodium content information provided on Lemon Crusted Sea Bass. Customers were aware of sodium as a nutrient, so there were more orders when the sodium content was provided on the RKR dinner menu (Table 7).
Table 7

*Comparison the Order Numbers between With and Without Sodium Label on dish 6 (Lemon Crusted Sea Bass)*

<table>
<thead>
<tr>
<th>Nutrient</th>
<th># of Orders Without</th>
<th># of Orders With Sodium</th>
<th>Test Value</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>44</td>
<td>72</td>
<td>2.722</td>
<td>1</td>
<td>0.099*</td>
</tr>
</tbody>
</table>

*Significant at the p<0.1 level.

Table 8 shows there was no statistically significant difference in Chicken Provencal’s order numbers between the days on which sodium content was listed on the menu and those on which no sodium content was listed. At the $\alpha = 0.05$ level, $X^2 (1) = 0.261$, $p > 0.1$ (significant = 0.609, $> 0.1$). Therefore, the results of this test indicated customers’
food selections were not significantly associated with the sodium content information provided on Chicken Provencal (Table 8).

Table 8

*Comparison the Order Numbers between With and Without Sodium Label on dish 7 (Chicken Provencal)*

<table>
<thead>
<tr>
<th>Nutrient</th>
<th># of Orders Without</th>
<th># of Orders With Sodium</th>
<th>Test</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Info</td>
<td>26</td>
<td>27</td>
<td>0.261</td>
<td>1</td>
<td>0.609</td>
</tr>
</tbody>
</table>

Table 9 shows there was no statistically significant difference in the number of orders of the Grilled Vegetable Lasagna between the days on which sodium content was listed on the menu and those on which no sodium content was listed. At the $\alpha = 0.05$ level,
\( X^2 (1) = 0.629, p > 0.1 \) (significant = 0.428, > 0.1). Therefore, the results of this test indicated customers’ food selections were not significantly associated with the sodium content information provided on Grilled Vegetable Lasagna (Table 9).

Table 9

Comparison the Order Numbers between With and Without Sodium Label on dish 8

(Grilled Vegetable Lasagna)

<table>
<thead>
<tr>
<th>Nutrient</th>
<th># of Orders Without</th>
<th># of Orders With Sodium</th>
<th>Test</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Info</td>
<td>Info</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Sodium          | 9                    | 15                      | 0.629  | 1  | 0.428 |

Table 10 shows there was statistically significant difference in Cassoulet’s between the days on which sodium content was listed on the menu and those on which no sodium content was listed. At the \( \alpha = 0.05 \) level, \( X^2 (1) = 6.193, p < 0.1 \) (significant = 0.013, <
0.1). Therefore, the results of this test indicated customers’ food selections were significantly associated with the sodium content information provided on Cassoulet.

Customers were aware of sodium as a nutrient, so there were fewer orders when the sodium content was provided on the RKR dinner menu (Table 10).

Table 10

*Comparison the Order Numbers between With and Without Sodium Label on dish 9 (Cassoulet)*

<table>
<thead>
<tr>
<th>Nutrient</th>
<th># of Orders Without</th>
<th># of Orders With Sodium</th>
<th>Test</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>31</td>
<td>18</td>
<td>6.193</td>
<td>1</td>
<td>0.013*</td>
</tr>
</tbody>
</table>

*Significant at the p<0.1 level.
Table 11 shows there was no statistically significant difference in the number of orders of the Braised Beef Short Rib between the days on which sodium content was listed on the menu and those on which no sodium content was listed. At the $\alpha = 0.05$ level, $X^2(1) = 0.106$, $p > 0.1$ (significant = 0.745, $> 0.1$). Therefore, the results of this test indicated customers’ food selections were not significantly associated with the sodium content information provided on Braised Beef Short Rib (Table 11).

Table 11

*Comparison the Order Numbers between With and Without Sodium Label on dish 10 (Braised Beef Short Rib)*

<table>
<thead>
<tr>
<th>Nutrient</th>
<th># of Orders Without Sodium Info</th>
<th># of Orders With Sodium Info</th>
<th>Test</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>52</td>
<td>66</td>
<td>0.106</td>
<td>1</td>
<td>0.745</td>
</tr>
</tbody>
</table>

35
Table 12 shows there was no statistically significant difference in the number of orders of the Apple Crisp between the days on which sodium content was listed on the menu and those on which no sodium content was listed. At the $\alpha = 0.05$ level, $X^2 (1) = 0.136$, $p > 0.1$ (significant = 0.713, > 0.1). Therefore, the results of this test indicated customers’ food selections were not significantly associated with the sodium content information provided on Apple Crisp (Table 12).

Table 12

*Comparison the Order Numbers between With and Without Sodium Label on dish 11 (Apple Crisp)*

<table>
<thead>
<tr>
<th>Nutrient</th>
<th># of Orders Without</th>
<th># of Orders With Sodium</th>
<th>Test Value</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Info</td>
<td>59</td>
<td>66</td>
<td>0.136</td>
<td>1</td>
<td>0.713</td>
</tr>
</tbody>
</table>
Table 13 shows there was no statistically significant difference in the number of orders of the Chocolate Espresso Pot De Crème between the days on which sodium content was listed on the menu and those on which no sodium content was listed. At the $\alpha = 0.05$ level, $X^2 (1) = 0.685$, $p > 0.1$ (significant = 0.408, $> 0.1$). Therefore, the results of this test indicated customers’ food selections were not significantly associated with the sodium content information provided on Chocolate Espresso Pot De Crème (Table 13).

Table 13

*Comparison the Order Numbers between With and Without Sodium Label on dish 12 (Chocolate Espresso Pot De Crème)*

<table>
<thead>
<tr>
<th>Nutrient</th>
<th># of Orders Without Sodium Info</th>
<th># of Orders With Sodium Info</th>
<th>Test</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>33</td>
<td>22</td>
<td>0.685</td>
<td>1</td>
<td>0.408</td>
</tr>
</tbody>
</table>
Table 14 shows there was no statistically significant difference in number of orders of the Pumpkin Spice Cake between the days on which sodium content was listed on the menu and those on which no sodium content was listed. At the $\alpha = 0.05$ level, $X^2 (1) = 0.691$, $p > 0.1$ (significant $= 0.406$, $> 0.1$). Therefore, the results of this test indicated customers’ food selections were not significantly associated with the sodium content information provided on Pumpkin Spice Cake (Table 14).

### Table 14

*Comparison the Order Numbers between With and Without Sodium Label on dish 13 (Pumpkin Spice Cake)*

<table>
<thead>
<tr>
<th>Nutrient</th>
<th># of Orders Without Sodium Info</th>
<th># of Orders With Sodium Info</th>
<th>Test</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Info</td>
<td>29</td>
<td>19</td>
<td>0.691</td>
<td>1</td>
<td>0.406</td>
</tr>
</tbody>
</table>

38
Table 15 shows there was no statistically significant difference in the number of orders of the Dr. Bob’s Profiteroles between the days on which sodium content was listed on the menu and those on which no sodium content was listed. At the $\alpha = 0.05$ level, $X^2(1) = 1.999$, $p > 0.1$ (significant = 0.157, $> 0.1$). Therefore, the results of this test indicated customers’ food selections were not significantly associated with the sodium content information provided on Dr. Bob’s Profiteroles (Table 15).

Table 15

*Comparison the Order Numbers between With and Without Sodium Label on dish 14 (Dr. Bob’s Profiteroles)*

<table>
<thead>
<tr>
<th>Nutrient</th>
<th># of Orders Without Sodium Info</th>
<th># of Orders With Sodium Info</th>
<th>Test Value</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>26</td>
<td>44</td>
<td>1.999</td>
<td>1</td>
<td>0.157</td>
</tr>
</tbody>
</table>
Table 16 shows there was no statistically significant difference in the number of orders of the California Cheese Plate between the days on which sodium content was listed on the menu and those on which no sodium content was listed. At the $\alpha = 0.05$ level, $X^2(1) = 0.60$, $p > 0.1$ (significant $= 0.807$, $> 0.1$). Therefore, the results of this test indicated customers’ food selections were not significantly associated with the sodium content information provided on California Cheese Plate (Table 16).

Table 16

*Comparison the Order Numbers between With and Without Sodium Label on dish 15 (California Cheese Plate)*

<table>
<thead>
<tr>
<th>Nutrient</th>
<th># of Orders Without Sodium Info</th>
<th># of Orders With Sodium Info</th>
<th>Test Value</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>13</td>
<td>17</td>
<td>0.60</td>
<td>1</td>
<td>0.807</td>
</tr>
</tbody>
</table>
CHAPTER 5

DISCUSSION

The aim of this study was to determine whether providing sodium information on restaurant menus affects customers’ meal choices. Sixty-five percent of the sodium daily recommendation of 2,300 mg per day is 1,500 mg. Therefore, any menu item containing more than 1,500 mg of sodium (≥65%) was considered to be high in sodium and any menu item with fewer than 1,500 mg of sodium (<65%) was considered to be low in sodium.

First, Table 7 shows a statistically significant difference (significant = 0.099, < 0.1) in the number of Lemon Crusted Sea Bass dishes ordered based on the various degrees of sodium content listed on the menu. When the Lemon Crusted Sea Bass dish was listed as having 30 percent of the recommended daily allowance of sodium (i.e. as a low-sodium food item), there were 28 more orders than when no sodium information was provided. This difference shows that customers’ food selections were significantly associated with the sodium content information that was provided on
menu items, perhaps because the customers who visited the RKR were aware that too much sodium could directly affect and harm their health.

Second, the results in Table 10 show a statistically significant difference (significant = 0.013, < 0.1) in the number of Cassoulet dishes ordered based on the various degrees of sodium content labeling on the menu. There were 18 orders of the Cassoulet dish when it was listed as having 75 percent of the recommended daily allowance of sodium (i.e. as a high-sodium food item), while there were 31 orders when no sodium information was included on the menu. The difference in the number of orders shows that customers noticed that the amount of sodium in this dish was very high and thus attempted to order a low-sodium entrée food item, such as Lemon Crusted Sea Bass or Chicken Provencal. The difference in the number of high-sodium food items ordered from the menu with sodium content information and from the menu lacking this information, the sodium content information provided on these items had a significant impact on customers’ food selections. The customers who visited the RKR perhaps understood that choosing food items that surpassed the 65 percent of the
recommended daily value of sodium could increase their risk of hypertension or cardiovascular diseases in the future.

Third, three high-sodium food items appeared on the menu: French onion soup had 96 percent of the recommended daily intake of sodium, grilled vegetable lasagna had 65 percent of the recommended daily intake of sodium, and braised beef short rib had 105 percent of the recommended daily intake of sodium. These three high-sodium food items show no statistically significant difference in terms of the order numbers. Additionally, when sodium content information on these three dishes was provided on the menu, their order numbers were actually slightly higher than when no such information was provided on the menu, perhaps because these customers typically had specific food habits. Although the customers noticed that these three dishes contained high levels of sodium, they still wanted to order them.

Fourth, ten low-sodium food items appeared on the menu: the Caprese salad had 4 percent of the recommended daily intake of sodium, shellfish vol-au-vent had 44 percent of the recommended daily intake of sodium, bistro salad had 46 percent of the recommended daily intake of sodium, pate maison had 58 percent of the recommended daily intake of sodium.
daily intake of sodium, chicken provencal had 49 percent of the recommended daily intake of sodium, apple crisp had 3 percent of the recommended daily intake of sodium, chocolate espresso pot de crème had 5 percent of the recommended daily intake of sodium, pumpkin spice cake had 13 percent of the recommended daily intake of sodium, Dr. Bob’s profiteroles had 14 percent of the recommended daily intake of sodium, and California cheese plate had 46 percent of the recommended daily intake of sodium.

There is no statistically significant difference among the order numbers of these ten low-sodium food items. Although eight out of these ten food items order numbers slightly increased when the sodium content information was provided compared with when it was not provided, there was no statistically significant difference in the order numbers. For the other two dishes, the order numbers of those with sodium content labels were lower than those without such information, perhaps because customers were unaware that desserts could contain sodium.

Overall, these findings lead us to believe that the sodium content information was helpful in encouraging and increasing customers’ selection of healthier foods. As the two dishes (those presented with and without sodium content information) generated
statistically difference results, presenting this information on the menu was the most effective way to inform customers who had have knowledge of the recommended daily sodium intake and who understood that too much sodium may increase their risk of hypertension, cardiovascular diseases, and other related health issues.
CHAPTER 6

CONCLUSIONS

The mixed results indicate that some of dishes’ order numbers were influenced by the sodium content information and that some were not. Therefore, we recommend that the RKR provide the sodium content of its dishes on its menu. Additionally, the numbers show that including sodium content information on the restaurant menu may lead to lower-sodium food choices compared with the choices made based on a menu that lacks sodium content information. Therefore, this study shows those customers’ food selections were significantly associated with the sodium content information provided on the restaurant menu. Additionally, many Americans are clearly knowledgeable about sodium and the consequences of excessive sodium consumption, such as hypertension, cardiovascular diseases, and other related health problems. However, it is still crucial that nutritional information appear on the restaurant menus so that customers can select healthier foods in the future.
IMPLICATIONS & APPLICATIONS

Based on these findings and those of other studies on healthy diets (Gi, Behnke, & Amanza, 2014), consumers may not perceive sodium intake as more important than the intake of other nutrients, such as overall calorie consumption. After all, maintaining a balanced sodium intake is only one aspect of a healthy diet. The unbalanced consumption of, for instance, calories, fat, saturated fat, cholesterol, trans fat, total carbohydrates, sugars, dietary fiber, and protein can also cause serious health problems. Therefore, consumers may not have a very clear understanding of the relationship between diet and disease (Holmes, Serrano, Machin, Duetsch, & Davis, 2013). Kim, Lopetcharart, Gerard, and Drake (2012) examined consumers’ knowledge of the relationship between diet and disease and found that only 10 percent of their 489 participants were aware that excessive sodium intake could increase their risk of cardiovascular diseases and hypertension. Another study (Garretson, & Burton, 2013) investigated respondents’ perceptions of diet and disease risks, and only 23 percent of them accurately associated fat consumption with a high risk of cancer. To make better decisions, consumers must understand the relationship between their
average daily dietary intake and the risk of associated diseases. The government must
enact health policies, and public health professionals must educate consumers through
initiatives, such as nutrition education programs and social media (Bruemmer,
Krieger, Saelens, & Chan, 2012). Increased knowledge of nutrition may help
consumers better interpret the nutrition information provided on restaurant menus and
thus improve the effectiveness of nutrition labeling (Jacquier, Bonthoux, Baciu, &
Ruffieux, 2012).
LIMITATIONS & SUGGESTIONS FOR FUTURE RESEARCH

This study also has several limitations that should be acknowledged. The sample size is small and limited because it includes only four days without the sodium content labeled on the dinner menu and four days with the sodium content labeled. Additionally, the RKR is a unique type of service restaurant that arranges many banquet activities during dinnertime, so the sample size was limited and small.

Second, the study sample was drawn from the customers dining in a restaurant located on the university campus. The primary customers consisted of university students, students’ families, the campus neighborhood, faculty and staff, and customers of Kellogg West Conference Center and Hotel. Therefore, the study lacks the demographic characteristics such as age range, gender, education level, income, and diet status of the American population. A more representative sample would allow the findings of this study to be more generalized.

Third, limited data was available about the reasons customers chose low-sodium foods. Even if customers gained knowledge of the negative effects of a high sodium diet, they may still make decisions to select high sodium menu items based on their
eating preferences and habits rather than their knowledge. Therefore, without sufficient information regarding the reasons for customers’ choices, it is difficult to determine the reasons customers selected the menu items they did. Future research is required to investigate how and to what extent customers’ selections are influenced by factors such as nutrition knowledge, eating preferences and habits, and prices of menu items.

Furthermore, the theory of planned behavior has its own limitations. Social cognition theories such as the theory of planned behavior are better at predicting deliberate behaviors (Baker & Swigt, 2009). Compared with other health behaviors, eating behavior is not as cognitive and rational. Thus, people’s daily food selections may not be explained thoroughly by cognitive beliefs alone (Wansink & Sobal, 2007). This study was conducted in a restaurant located on a university campus. Future research in this area could also be conducted in other restaurant settings. Comparisons of listing sodium information on menus in different restaurant settings could lead to a better understanding of the effectiveness providing sodium information on menus has
on consumers’ healthy eating behaviors. These comparisons can help public health policymakers improve the effectiveness of health promotion interventions.

Finally, future research can focus on whether menus with sodium information will attract more customers, especially those with knowledge of healthier eating, and whether these menus can create innovative selling points among competitors. This study can help restaurants and other foodservice operations determine whether they should develop low sodium menu items to increase sales and meet market needs.
REFERENCES


Bruemmer, B., Krieger, J., Saelens, B. E., & Chan, N. (2012). Energy, saturated fat, and sodium were lower in entrees at chain restaurants at 18 months compared with 6 months following the implementation of mandatory menu labeling.
regulation in King Count, Washington. *Journal of Academy of Nutrition and Dietetics*, 112(8), 1169-1176.


pleasure mechanisms involve in food-choice decisions. *Nutrition Reviews*, 70(2), 118-131.


Nestle, M., Wing, R., Birch, L., DiSogra, L., Drewnowski, A., Middleton, S.


Restaurant menu labeling: Is it worth adding sodium to the label? Canadian

Public Health Association, 105(5), 354-359

U.S. Food and Drug Administration (2011). Food labeling; Nutrition labeling of

standard menu items in restaurants and similar retail food establishments;

Proposed rule. Federal Register, 76(66), 19191-19236. Retrieved from:


Wansink, B., & Sobal, J. (2007). Mindless eating: The 200 daily food decisions we

overlook. Environment and Behavior, 39(1), 106-123.
