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# Nutrition labeling for restaurant menu item: College students' preferences for nutrition information and its influence on purchase intention

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**Nutrition labeling for restaurant menu items: College students' preferences for  
nutrition information and its influence on purchase intention**

By

**Kelly Nicole Mayfield**

A thesis submitted to the graduate faculty

In partial fulfillment of the requirements for the degree of

**MASTER OF SCIENCE**

Major: Foodservice and Lodging Management

Program of Study Committee:  
Robert Bosselman, Co-Major Professor  
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Ames, Iowa

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## **CHAPTER 1: INTRODUCTION**

### **Background**

Over the past few decades, there has been a dramatic increase in obesity in the United States such that today, nearly two thirds of American adults are overweight (Thompson, 2004; FDA , 2006). Combating the obesity epidemic remains the center of debate among health professionals, consumers, health advocates and scientists. Despite their efforts obesity remains the fastest-growing cause of disease and death in America and plays a role in several chronic conditions including diabetes, cancer, heart disease, and breathing problems (Carmona, 2003; Thompson, 2004).

In response to the health and economic burden of obesity on our nation, the Centers for Disease Control and Prevention (CDC) outlined recommendations for Americans to follow to decrease the epidemic (CDC, July 2009). The recommendations promote physical activity in addition to healthy eating. The Nutrition Labeling and Education Act of 1990 played a role in improving overall dietary quality in the 70 – 85% of the population which sometimes use the nutrition label, but despite this, the epidemic continues (Savage & Johnson, 2006). It is not required that much of the food the nation eats today have a nutrition fact panel, nutrition claims, and nutrition reference amounts because this information is not mandatory to appear on all food service menus or point of sale materials (Shields, 1996). Consumption of food outside the home has increased substantially over the last 50 years. Americans spent 25% of their food budget on dining out in 1955 compared with 46% in 2004 (National Restaurant Association, 2004).

Because about 50% food expenditures are spent on eating away from home (Harnack & French, 2008), attention has shifted to nutritional content of retail food service

offerings. Retail food service menu offerings are often high in nutrients that should be consumed in moderation and low in nutrients that should be consumed in abundance; overall these foods are high in calories (Savage & Johnson, 2006). Burton, Creyer, Kees and Huggins (2006) found consumers greatly underestimate fat, saturated fat and sodium levels in restaurant foods. Thus, an increase of undesirable nutrients with the simultaneous decrease of desirable nutrients can easily go unnoticed.

There are certainly potential public health benefits of providing easily accessible nutrition information for restaurant menu items. The addition of calorie and nutrient information for menu items has been shown to influence attitudes, purchasing intentions, and menu selections (Burton et al., 2006). When restaurants present nutrition information for healthy menu options, consumers are likely to recognize the good source of nutrition and select the healthier menu options over the less healthy options. Moreover, consumers are willing to pay more for an item when nutrition information is provided (Hwang & Lorenzen, 2008).

Giving customers easy access to nutrition information for restaurant menu items allows consumers to make well-informed dietary decisions. Given the obesity epidemic, the trend towards eating away from the home, and consumers' tendency to underestimate levels of undesirable nutrients in foods, empowering consumers with the knowledge of nutritional composition of restaurant foods may lead to more healthful menu choices (Harnack & French, 2003), and in turn have a significant public health benefit, namely in reducing consumers' calorie and undesirable nutrient intake.

Because limited legislation exists requiring restaurants to provide nutrition information for menu items, there is not an established best practice for determining to

what extent nutrition information should appear on the menu. Hwang and Lorenzen (2008) investigated the effectiveness of various amounts of nutrition information and concluded the most effective menu includes information about calories, macronutrients, and fat. Fiber content of menu items was not deemed of great importance to appear on menus. Health claims on foods have been found useful to assist consumers in making informed menu selections (Thomas & Mills, 2006). Consumers are more likely to purchase products which feature a health claim (Williams, 2005).

This study investigates perceptions of a distinct class of consumers – college students. This demographic is establishing eating habits that will follow them through life (Rowe, 2008), and which will undoubtedly shape the habits of their offspring, the next echo generation. Most college students' dietary intakes do not meet daily recommendations for most food groups (American College Health Association, 2009). The American College Health Association (2009) reported 8.5% of college students polled consumed five or more servings of fruits and vegetables daily. Poor dietary behaviors among this demographic are of particular concern to health professionals because dietary knowledge, beliefs, and behaviors established during the college years of life may carry over into adulthood and strongly influence future health status (Dinger & Waigandt, 1997). The U.S. Department of Health and Human Services (*Healthy People 2010*, 2000) recognizes the importance of individuals understanding the link between dietary intake and disease; one of the *Health People 2010* objectives is to increase the proportion of college and university students who receive information regarding dietary practices which cause disease.

### **Significance of Study**

Studying the effect of marketing nutrition information and determining the important nutrition information to college students will give valuable insight about what influences this class of consumers to spend their money on healthier food options. Knowing what is important to this generation in regards to nutrition information will allow marketers and nutrition educators to develop effective strategies which would allow food service venues to continue to receive the dollar vote of this population while enhancing the health of these consumers throughout their lifetime.

Effective nutrition labeling in restaurants will enable consumers the ability to accurately assess nutrition composition of menu selections. The results of this study will add to the body of literature which explores the need for nutrition information on restaurant menus and consumers' preferences for specific types of information. Because the space for auxiliary information is limited on restaurant menus and menu boards, it is essential for menu designers to understand the weight consumers put on specific classes and types of nutrition information. With the knowledge of such, menus can be tailored to present this information in the most effective way. Likewise, legislatures can take findings of this study and similar studies under consideration when composing new legislation requiring nutrition information availability in the restaurant sector.

Though effective nutrition labeling has been investigated (Hwang & Lorenzen, 2008), there is limited research pertaining to college students' preferences for nutrition information content. Because college students are shaping habits that will follow them through their life time and be passed on to future generations, it is imperative to understand preferences for nutrition information appearing on restaurant menus. The purpose of this

study is to identify traditional college students' preferences for type of nutrition information to appear on restaurant menus. The study investigates whether the report of macronutrients, specific vitamins and nutrients or health claims on restaurant menus are important for consumers' decision making process and whether the report of these items influences intent to purchase.

### **Research Questions**

This study sought to answer the following research questions:

1. What type of nutrition information do college students find important on restaurant menus when making a menu selection?
2. Does the presence of total calorie and macronutrient information on restaurant menus influence the intent to purchase an item?
3. Does the presence of specific nutrient facts on restaurant menus influence the intent to purchase an item?
4. Does the presence of a health claim on restaurant menus influence the intent to purchase an item?

### **Definition of Terms**

Body Mass Index: (BMI) is a measure of body fat that is the ratio of the weight of the body in kilograms to the square of its height in meters. *Body mass index* in adults of 25 to 29.9 is considered an indication of overweight, and 30 or more an indication of obesity. (*Miriam-Webster's Medical Dictionary*, 2011)

Macronutrient: a chemical substance (as protein, carbohydrate, or fat) required in relatively large quantities in nutrition. (*Miriam-Webster's Medical Dictionary*, 2011)

## CHAPTER 2: REVIEW OF LITERATURE

### Obesity in America

#### *An Overview*

Over the past two decades, there has been a dramatic increase in obesity in the United States such that today, only the state of Colorado has an obesity rate less than 20% of its population (CDC, 2010). Today, nearly two thirds of adults in the U.S. are overweight, of which 30% are classified as obese according to the National Health and Nutrition Examination Survey (NHANES) of 1999-2002 (Thompson, 2004; U.S. FDA 2006). Overweight is defined as an individual with Body Mass Index (BMI) of 25 to 29.9, while obesity is categorized as an individual with a BMI of 30 or greater (DHHS, Office of the Surgeon General, 2007; CDC, 2010). BMI is calculated using a person's weight and height, and is an indicator of body fatness and weight categories that may lead to health problems (CDC, 2010).

According to the United States Surgeon General, obesity is the fastest-growing cause of disease and death in America (Carmona, 2003). Overweight and obesity are factors for chronic conditions including diabetes; cancers – namely those of the breast, colon, kidney, esophagus and endometrium; premature death; heart disease; breathing problems such as asthma and sleep apnea; arthritis, and psychological problems (Thompson, 2004; DHHS, Office of the Surgeon General, 2007). Excess weight gain contributes significantly to the number of people with type 2 diabetes. There are over 17 million Americans living with diabetes and another 16 million with pre-diabetes (Carmona, 2003). Diabetes leads to eye diseases, cardiovascular problems, kidney failure, and early death (Carmona, 2003).

One of eight deaths in the United States today is caused by a disease which is directly related to overweight and obesity totaling upwards of 300,000 deaths annually (Carmona, 2003; DHHS, Office of the Surgeon General, 2007). Overall, persons who are obese spent 42% more for medical care in 2006 than did normal weight people (CDC, 2009). National health costs from obesity grow as the epidemic grows. In 2000 total costs from obesity were estimated at \$117 billion – this figure taking into account medical costs and days lost from work due to illness, disability, or premature death (Thompson, 2004; FDA, 2006). Finkelstein, Trogon, Cohen and Dietz (2009) estimated the health cost of obesity in the United States is now \$147 billion, every year.

### *Reversing the obesity epidemic*

Combating the obesity epidemic remains the center of debate among health professionals, consumers, health advocates, and scientists. William Heitz, the director of CDC's Division of Nutrition, Physical Activity and Obesity (CDC, 2009) said, "Reversing this epidemic requires a multifaceted coordinated approach that uses policy and environmental change to transform communities into places that support and promote healthy lifestyle choices for all people" (p. 1). In the last decade, the government has implemented a number of health initiatives to address the need to reduce overweight and obesity in America.

In 2003, the Surgeon General discussed the need to increase the nation's health literacy as low literacy contributes to the nation's obesity epidemic. Health literacy is defined as 'the ability of an individual to use health-related information and services to make appropriate health decisions' (Carmona, 2003, p. 5). The Chief of Public Health

Practice identified one role of the government in combating the epidemic is to develop clear, coherent and effective health messages to ensure consumers have accurate and adequate information to make informed decisions about improving their health (Thompson, 2004). Health initiatives aimed to decrease obesity emphasize the need for easy-to-understand health information that fits into American's busy lifestyles to enable healthy dietary decision making (Carmona, 2003).

The U.S. Food and Drug Administration (FDA) is the government agency which provides oversight of the current food labeling system, and has been instrumental in confronting the obesity epidemic (Savage & Johnson, 2006). In 2004, FDA's Obesity Working Group (OWG) developed an action plan to address the obesity epidemic; their recommendations were made on the basis of the scientific fact that weight control is a primary function of caloric balance (FDA, 2006). In order to gain caloric balance, one must first know how to obtain and understand caloric content of foods.

FDA's "Make your Calories Count" educational web-based program is designed to teach consumers how to use the nutrition label to understand and plan a healthful diet. The program emphasizes serving sizes and calories; identification of nutrients which should be limited in the diet – namely sodium and saturated fat; and identification of nutrients which should be consumed in adequate amounts – namely fiber and calcium (FDA May 2009). The program is based on the assumption if consumers are taught how, they can take control of their caloric intake, make healthy food choices and ultimately have effective weight management achieved in part by good nutrition.

Americans spend about 46% of their food budget on food prepared and purchased away from the home, accounting for 32% of caloric intake (FDA, 2009). Thus, away-

from-home foods can have a significant impact on health. The FDA recognizes that in light of the increased percentage of consumption of away-from-home foods, combined with the general lack of easily accessible nutrition information of such foods, emphasis must be put on this area when considering means through which to reduce its impact on obesity.

Through a non-profit organization called the Keystone Center, experts in industry, government, civil sector organizations and academia have constructed a report which provides recommendations for improving consumers' ability to manage caloric intake from foods prepared and purchased outside of the home (FDA, 2006). One section of the Keystone Forum Recommendations was centered on providing consumers with nutrition information. The experts recommend away-from-home food establishments should provide consumers with calorie and nutrition information in a standard, easily accessible, user-friendly format (FDA, 2009). It was further recommended that research should be conducted on how consumers use nutrition information for away-from home foods. This research study will address such.

### **Nutrition Labeling**

#### *The Nutrition Labeling and Education Act of 1990*

The Nutrition Labeling and Education Act (NLEA) of 1990 set regulations for the use of health and nutrition claims and dramatically changed the presentation of nutrition facts on food packages thereby increasing the amount of information available for these products at point-of-purchase. Food labeling requirements resulting from the passage of this legislation comprised the most comprehensive changes in food product labeling in

over 60 years (Garretson & Burton, 2000). The primary goal of this legislation is to assist consumers in maintaining healthy dietary practices by providing clear, concise information to assist consumers make informed dietary decisions (NLEA, 1990; FDA, 1993). This objective stands on the basis of the Health Belief Model for behavior change; nutrition information on food labels are potentially ‘cues to action’ which play a role in helping consumers to make more healthful choices (Janz & Becker, 1984; Lando & Labiner-Wolfe, 2007).

The Nutrition Facts panel which has been displayed on most packaged foods since 1994 is a byproduct of the NLEA as the law requires almost all packaged foods list calorie, fat, saturated fat, cholesterol, sodium, fiber, sugar, protein, vitamin and mineral content (NLEA 1990; Garretson & Burton, 2000). An additional direct result of the legislation is that the FDA set premarket standards for both health and nutrition claims for foods. Such regulations require that if a claim such as “light” or “low fat” is made, the fat content of products must be reduced; this has since resulted in thousands of new products on the market which meet FDA requirements to make such claims (Silverglade, 1996). Even consumers who do not read the nutrition label can benefit from these new product reformulations because there are far more reduced fat options from which to select.

### *Health Claims*

Among other factors, the NLEA was passed partly in response to a decade of misleading and confusing claims for products. The legislation permits the use of two types of claims, health claims and nutrition claims, for food products as long as the claims are made within the guidelines. By definition, a nutrition claim is a statement which declares

food has particular nutritional properties (Food and Health Organization of the United Nations/World Health Organization, 2010). Claims such as “high in fiber,” “good source of calcium,” and “reduced calorie,” “low fat,” “sugar free” are examples of approved nutrition claims under the NLEA legislation (NLEA, 1990; Williams, 2005).

Health claims are used to emphasize relationships between a nutrient and risk of a health related condition (Garretson & Burton, 2000; NLEA, 1990; Williams, 2005). Conveying specific nutrient-disease reduction because health claims must be supported by a sound and sufficient body of scientific evidence to validate the statements, the FDA has authorized the use of nine health claims which can only appear on foods which meet stringent nutritional requirements (Food and Health Organization of the United Nations/World Health Organization, 2010; Silverglade, 1996). Unlike nutrient claims which simply highlight levels of specific nutrients in foods, health claims were established by the FDA to help educate consumers about the relationship between diet and disease (Garretson & Burton, 2000; Silverglade, 1996).

Health claims are statements which imply a relationship exists between food or constitution of that food and health (Food and Health Organization of the United Nations/World Health Organization, 2010). There are three classifications for health claims; nutrient function claims, other function claims, and health claims. A nutrient function claim describes the physiological role of a nutrient in growth, development and normal functions of the body while other function health claims concern specific beneficial effects of the consumption of foods and their constituents in the context of the diet on normal functions of the body; reduction of disease risk claims relate to the consumption of a food (or constituent) in the diet to reduce the risk of developing a disease or health

related condition (Food and Health Organization of the United Nations/World Health Organization, 2010). Health claim statements must consist of two parts: information on the physiological role of the nutrient or on an accepted diet-health relationship followed by information on the composition of the product relevant to the physiological role of the nutrient or the accepted diet-health relationship (NLEA, 1990; Food and Health Organization of the United Nations/World Health Organization, 2010).

### *Outcomes of the NLEA*

Several studies have been conducted to examine issues related to the objectives of the NLEA to reduce consumer confusion regarding nutrition information and health claims provided on packaged food products (Andrews, Netemeyer & Burton, 1998; Garretson & Burton, 2000; Keller, Landry, Olson, Velliquett, Burton & Andres, 1997; Kozup, Creyer, & Burton, 2003). The overall census is that even though the provision of nutrition information and health claims on packaged food products has been successful in terms of helping educate consumers about nutrient contents and nutrient-disease relationships, consumers may not reap all potential benefits of such for a number of reasons.

After the enactment of the NLEA one study found an increase in consumers' sensitivity to negative nutrition attributes including fat and sodium, but not to calories (Balasubramanian & Cole, 2002). This illustrates how there were in fact some changes in attitude toward specific nutrients as a result of the NLEA. Studies found consumers place greater importance of fat levels than other key nutrients (including cholesterol, sodium and fiber) that are scientifically linked to disease risk (Garretson & Burton, 2000; Keller et al., 1997).

*Impact of nutrition information and health claims on consumer attitude and behavior*

The underlying notion is that if consumers have reliable, easily accessible nutrition information available and if the relationship between diet and risk of diseases is understood, risk-reducing food selections may be made (Balasubramanian & Cole, 2002). Crites and Aikman (2005) found nutrition knowledge has a moderate effect on food attitudes and subsequent consumption behaviors yet these effects can be moderated or overridden by other factors including flavor, cost, convenience, and societal factors. While it is difficult to effect a significant attitude and behavior change with the provision of nutrition information alone, it remains important to provide such information to enable consumers to make informed decisions if they so choose. The behavior change of selecting healthful menu options has the potential to reduce costs to society of treating conditions directly correlated with dietary intake.

There are several positive effects of the provision of health claims on packaged foods. Health claims displayed prominently on the front of food packages can grab the attention of consumers whether or not the Nutrition Facts panel is viewed. The inclusion of health claims on packaged food items has a positive influence on nutrition attitude, perceived healthfulness, and purchase intention (Kozup et al., 2003; Williams, 2005). Some speculate the inclusion of health claims on packaged food labels may create a “halo” effect discouraging consumers from seeking more information to evaluate the complete nutritional value of an item with a health claim (Williams, 2005). However, consumers seem to be capable of using nutrition information for nutrition and product evaluations in

the context of packaged food environment (Keller et al., 1997) and the “halo” effect does not appear to be as relevant as once thought.

Nonetheless, a noteworthy interaction exists between the provision of both health claims and nutrition information on packaged food products. Though health claims can be useful to highlight the relationship between a food constituent and disease risk, several studies have found that consumers rely on the nutrition information to a greater extent than they do on nutrition claims when making product evaluations (Garretson & Burton, 2000; Keller, Landry, Olson, Velliquest, Burton & Andres, 1997). When claims are inconsistent with provided nutrition information, lower evaluations of manufacturer credibility result and there is no positive effect on nutrition attitude or purchase intention (Garretson & Burton, 2000; Kozup et al., 2003).

The primary objective of the NLEA is to promote healthy dietary practices through nutritionally sound food choices, however, it should be recognized that unless a consumer’s attention to nutrition includes all foods on all eating occasions, and includes consideration of all nutrients, the efforts to control dietary intake will remain ineffective (Balasubramanian & Cole, 2002). Because consumers don’t have easy access to nutrition on all eating occasions, namely when eating food prepared for immediate consumptions, consumers may attend to nutrition on limited occasions therefore nutrition information on restaurants menus must be made more accessible to consumers (Balasubramanian & Cole, 2002).

*Nutrition information for away-from-home foods*

Improved nutrition labeling on packaged foods as a result of the NLEA has prompted consumers to alter their food choices while grocery shopping (Guthrie, Derby & Levy, 1999). However, nutrition labeling is not required of most food prepared for immediate consumption under this legislation (NLEA, 1990). The term 'away-from-home food' refers to foods obtained from foodservice and entertainment establishments, regardless of where these foods are consumed; this includes restaurants, fast foods, school cafeterias, vending machines, or someone else's home (Lin & Frazao, 1997). Over the last two decades, the importance of away-from-home foods in the American diet has grown substantially. Several factors influence consumers to eat outside of their home including special occasions, gathering of friends, mood, convenience, and taste/flavor (Narine & Badrie, 2007). Eating out was once considered a 'treat' but is now a normal part of the American diet, accounting for about one third of daily caloric intake (Guthrie et al., 1999).

The nutritional quality of foods for immediate consumption has received much attention in the discussion of improving the American diet. Consumers who frequently consume away-from-home food often consume a poorer quality of diet than those who eat out less frequently (Clemens, Slawson & Klesges, 1999). Away-from-home foods generally have higher densities of calories, fat, saturated fat, cholesterol and sodium, and are lower in dietary fiber, calcium, and iron than at-home foods (Guthrie, Lin & Frazao, 2002). When people eat out, they usually eat more calories per sitting than when eating at home; many restaurant meals provide 1000 to 2000 Calories - each of which is equivalent to 35% to 100% of a full day's energy requirements for most adults (Jacobson, 2004; Nestle & Jacobson, 2000). This excessive caloric intake can lead to weight gain over time

which is why the away-from-home foods are a contributor to the obesity epidemic our nation faces today.

One contributing factor for the overconsumption of calories and macronutrients may be attributed to the lack of nutrition information for away from home foods. When nutrition information is presented on restaurant menus consumers are given the opportunity to assess healthfulness of items based on an objective report and can therefore make informed dietary decisions. After all, it is one thing to actively indulge because you want to, but it's another thing to splurge without even knowing it.

### **Nutrition Information on Restaurant Menus**

Consumers have easy access to important nutrition information when evaluating packaged food products because of the Nutrition Facts panel. However, given that Americans are consuming less food prepared at home, and since the disclosure of nutrition information for away-from-home foods is in most cases not required, many consumers are unable to accurately assess the healthfulness of their dietary choices and overall dietary quality. The trend for Americans eating food outside of the home is steadily increasing due to rising incomes, decreased time for cooking and affordable dining options (Lin & Frazao, 1997). These factors which contribute to the decision to dine out are expected to continue heightening consumer demand for away-from-home food (Lin & Frazao, 1997). Given the increase in consumers' spending on restaurant food, it can be logically concluded that a majority of the food purchased for consumption outside of the home would not include a label so the increase of some nutrients with the simultaneous decrease in others is easily overlooked without nutrition labeling (Savage & Johnson, 2006).

Current government nutritional recommendations have been tailored to identify specific nutrients that need to be consumed in moderation, limited or increased. Restaurant foods are often high in nutrients recommended to be consumed in moderation such as sodium, saturated fat, cholesterol; high in calories; and low in the nutrients that are recommended to be in abundance such as fiber and calcium (Savage & Johnson, 2006). Compared with at-home foods, on average, away-from-home foods have higher fat, saturated fat, cholesterol, and sodium densities and are lower in fiber and calcium (Lin & Frazao, 1997). Making informed healthful choices at restaurants is difficult in the absence of nutrition information due to common misestimating of caloric and nutrient content of these foods (Wootan & Osborn, 2006). Consumers are not always aware of high levels of undesirable nutrients as they tend to underestimate calories, fat, and sodium in restaurant menu items (Burton & Creyer, 2004; Burton et al., 2006; Kozup et al., 2003). Having nutrition information available on restaurant menus allows consumers to make more informed healthier choices if they so choose.

The provision of easily accessible nutrition information in the retail foodservice sector can provide significant public health benefits because it enables consumers to make informed dietary decisions (Burton et al., 2006). Even though nutrition information may not always be used to make menu selections, consumers generally favor having such information available (Crites & Aikman, 2005; Lando & Labiner-Wolfe, 2007; O'Dougherty, Harnack, French, Story, Oakes & Jeffery, 2006; Thomas & Mills, 2006).

*Influence of nutrition information on restaurant menus*

The provision of calorie and nutrient information for menu items has been shown to influence consumer attitudes, purchase intentions and selections (Burton et al., 2006; Hwang & Lorenzen, 2008), though the extent to which attitudes, selections and purchase intentions are influenced remains a subject of debate among scholars.

Crites and Aikman (2005) indicated nutrition knowledge has a moderate effect on food attitudes and behaviors; the effects of nutrition knowledge may be moderated or overridden by other factors including flavor, social factors, convenience, and cost. The findings of another study which examined the fast food sector specifically suggests point-of-purchase nutrition information may have minimal influence on food choices due the competing factors of taste, convenience, and price (O'Dougherty et al., 2006). Despite this fact, participants of the study conducted by O'Dougherty et al. reported often or sometimes using nutrition information on packaged food products so it is possible that if nutrition information is made available in food establishments they may be used, potentially generating increased concern with nutrition when dining out.

*Impact of health claims on restaurant menus on consumer attitude and behavior*

Consumers' misconceptions about the healthfulness of away-from-home foods suggest those who frequently dine out might not consider the long-term disease risk associated with their diet. Previous studies have shown, however, that once consumers become aware of the nutrient levels in away from home foods, perceptions of disease risk likelihood increase and purchase intentions decrease (Burton & Creyer, 2004). Health claims can be used to highlight the relationship between specific nutrients and disease risk.

Thomas and Mills (2006) found health claims, such as heart healthy, are viewed as helpful information when attempting to make informed decisions about restaurant menu items.

The inclusion of heart healthy claims on restaurant menus can have a positive influence on nutrition attitude and purchase intentions and reduced disease risk perceptions in the absence of nutrition information and can also be a supplement to nutrition information when it is provided (Kozup, et al., 2003). Likewise, Fitzgerald, Kannan, Sheldon, and Eagle (2004) suggested point-of-purchase heart healthy messages produce positive outcomes toward changing nutrition choices and behavior.

The use of icons to designate more healthful options on restaurant menus could help make choosing such options easier especially in the absence of nutrition information (Lando & Labiner-Wolfe, 2007; Svderberg, Gustafsson, Reutersward, & Svenson, 2008).

#### *Consumer preferences for type of nutrition information on restaurant menus*

Legislatures are beginning to address the issue of the lack of nutrition information availability in restaurants and other retail foodservice sectors. The U.S. Senate, U.S. House of Representatives, and more than a dozen legislatures have introduced legislation to require chain restaurants to provide nutrition information (Wootan & Osborn, 2006). Most of these bills limit requirements to chain restaurants which employ standardized recipes in standardized menus and portions. Pending legislation requires the nutrition information to be provided in easily accessible, easy-to-use formats at the point of purchase and limits the information to calories on menu boards with limited space and to calories, saturated fat, trans fat, and sodium on printed menus (Wootan & Osborn, 2006).

In the packaged food sector, the nutrition facts panel includes a calorie count and macronutrients (fat, carbohydrates, and protein) as well as specific nutrients consisting of saturated fat, trans fat, cholesterol, sugar, sodium, dietary fiber, potassium, Vitamin A, Vitamin C, calcium, and iron. Though calories, saturated fat, trans fat, and sodium are the main nutrients listed to appear on restaurant menus in pending legislation, it is questioned whether this type and amount of nutrition information is in alignment with consumers' desires. Since restaurant menus have limited space, a determination must be made regarding which nutrients are important to consumers to appear on menus. Hwang and Lorenzen (2008) found subjects perceived menus which included calorie, macronutrient, and specific fat content of a menu item was deemed most effective and most credible. Mills and Thomas (2008) concluded fat and calories to be important types of information to appear on restaurant menus while sodium was not found important. Respondents in a study conducted by Josiam and Foster (2006) indicated fat, saturated fat and trans-fat are extremely important aspects of nutrition information on restaurant menus.

Previous studies have shown consumers are more conscious about specific nutrients than other depending on special diets, eating strategies, or health issues (Lando & Labiner-Wolfe, 2007). For example, for individuals with diabetes, it is often problematic to calculate carbohydrates in a restaurant setting without readily available nutrition information so this is of great importance when determining preferences for type of nutrition information (Hayes, 2004). This study investigated which specific nutrients are important for consumers to see on restaurant menus when making menu selections. The survey inquired about all nutrients which are required to appear on packaged food products as outlined by the NLEA.

### **Research Statement**

The purpose of this study is to identify what type of nutrition information consumers find important to appear on restaurant and other restaurant menus. The research will investigate whether the provision of calorie and macronutrient-level information (calories, fat, carbohydrate, and protein), specific vitamin and nutrient information (saturated fat, sodium, fiber, vitamin A, etc.) or health claims are important to the consumer. Furthermore, the study will examine the extent to which those items influence consumers' intent to purchase food items.

## **CHAPTER 3: METHODOLOGY**

### **Introduction**

A quantitative approach was employed to examine college students' preferences for nutrition information on restaurant menus and its effect on intent to purchase. Data collected from questionnaires was utilized to investigate whether the report of calorie and macronutrient-level information (calories, fat, carbohydrate, and protein), specific vitamin and nutrient information (saturated fat, sodium, fiber, vitamin A, etc.) or health claims are important to participants when making restaurant menu selections. Whether those respective items influence consumers' purchase intention was subsequently assessed.

### **Use of Human Subjects**

The Application for Approval of Research Involving Humans was submitted to the Institutional Review Board of Iowa State University (ISU). The research was deemed exempt from the requirements of the human subject protections regulations. However, this determination was contingent upon approval from participating universities. Subsequently, letters of approval were obtained from Oklahoma State University (OSU) and Washington State University (WSU). Approval letters can be found in Appendix A.

### **Participants**

Most college students' dietary intake does not meet daily recommendations for most food groups (American College Health Association, 2009). Poor dietary behaviors among this demographic are of particular concern to health professionals because dietary knowledge, beliefs, and behaviors established during the college years of life may carry

over into adulthood and strongly influence future health status (Dinger & Waigandt, 1997). Studying the effect of nutrition marketing information and determining the most important nutrition information to college students will give valuable insight about what influences this class of consumer to spend their money on healthier food options. Since college students are shaping habits that will follow them through their lifetime and be passed on to future generations, it is imperative to understand their preferences for nutrition information appearing on restaurant menus.

This study examines the views of traditional college students who attend one of three selected land-grant universities majoring in either dietetics or hospitality in the spring of 2011. For the purposes of this study, traditional college students are defined as undergraduate students aged 18 to 24 years old. Students from ISU, OSU, and WSU were invited to participate in this study. These universities were selected because they have either dietetics or hospitality undergraduate majors or both, and are land grant universities. Because the survey was administered through the internet, low response rates were anticipated. For that reason, all undergraduate students majoring in dietetics or hospitality management at the aforementioned universities were invited to participate. The total population consists of 745 students, comprised of 270 dietetic students and 475 hospitality students.

### **Survey Instrument**

Potential survey questions were compiled based on previous research. A pilot study was used to ensure content and face validity. Participants in the pilot study included graduate students outside of the study population. As a result, a few items were eliminated

or altered to ensure the language used was clear and better understandable to respondents. The final survey instrument was evaluated by expert reviewers to ensure content, and that cognitive and usability standards were met. The questionnaire consists of three main sections; food related lifestyles, nutrition information on restaurant menus, and demographic data.

The first section was designed to obtain information regarding frequency of eating in restaurants, attitude toward eating in restaurants, and the types of restaurants frequented. These questions were modeled after instruments used in other studies (Josiam & Foster, 2009; Mills & Thomas, 2008). Particularly dealing with the population college students, it is probable that some respondents live on-campus in residence halls where their primary source of food is via restaurants or cafeteria dining. If such a student responds to this survey, he would select the following to describe him best: 'I dine in restaurants as a necessity' and 'at least once a day.' It would also be expected for such a student to select the 'cafeteria' answer choice to indicate the type of restaurants in which he dines at least once per month. By asking these three food related lifestyle questions, it enables the grouping of like participants for analysis.

The survey instrument was designed to measure three main constructs and the relationship each has with purchase intention. The three constructs include macronutrient and total calorie information; specific nutrient information; and health claims. Similar to Josiam & Foster's (2009) instrument, the questionnaire asked respondents to rate the importance of specific nutrient information on restaurant menus when making menu selections. Responses were plotted on a 7-Likert scale ranging from 'extremely important' to 'not important at all for each nutrient including fat, saturated fat, trans fat, cholesterol,

total Calories, sugar, carbohydrate, protein, sodium, dietary fiber, potassium, Vitamin A, Vitamin C, calcium, and iron. The list of nutrients used is identical to the unabbreviated version of the Nutrition Facts panel which currently appears on packaged foods.

In order to assess whether the presence of specific nutrient information on restaurant menus will affect students' decision to purchase an item, a second series of questions will be asked. The header of the section read, 'If nutrition information is presented on a restaurant menu, will the amount of the following nutrient influence your decision to purchase the food item?' The same list of nutrients used in the previous series of questions was inquired about, in the same order.

Participants were also asked to rate the importance of health claims on restaurant menus. The health claim section involved the use of a structure function claim. Participants were asked to rate the importance of such a claim to appear on restaurant menus on a 7-point Likert scale ranging from 'extremely important' to 'not important at all' with the additional option of 'not sure.' The second question in this section addressed whether the presence of health claims on restaurant menus affects their intent to purchase items.

The final section of the questionnaire is dedicated to obtaining demographic data. Included are questions on gender, age, classification as an undergraduate or graduate student, race/ethnicity, U.S. citizenship, marital status, whether the respondent lives in campus housing, weight and height. The weight and height responses will be used to calculate respondents' Body Mass Index. The knowledge of BMI permitted each respondent to be classified as underweight, normal weight, overweight or obese in terms of established BMI cutoff points.

### **Data Collection**

Lists of students' names, e-mail addresses and majors were obtained from the registrar's office of each participating university. Though the study population is limited to students aged 18 to 24 years old, this information was not disclosed at the time of e-mail list retrieval. Because of this, the survey instrument contains a qualifying question regarding respondent's age. Unfortunately, it is unknown how many non-respondents were not part of the initial population due to the lack of availability of age data.

Members of the sample were contacted via e-mail. The initial e-mail communication contained an introduction of the researcher and a brief explanation of the purpose of the survey. This correspondence contained a direct link to an informed consent page and subsequently to the survey itself. The survey consists of five web pages; the first contains the food related lifestyle questions, the second and third contain items on specific nutrient information and its effect on purchase intentions; the fourth on importance and influence of health claims and the final page is dedicated to the collection of demographic data. Because a high nonresponse rate was anticipated due to the survey mode, a second invitation was sent to members of the sample who did not respond to the survey after the initial contact. The second wave of e-mail invitations was disseminated one week after the first; the total collection period was 2 weeks long. There were a total of 123 surveys returned; 113 of which were used for data analysis.

### **Data analysis**

SPSS (PASW) Version 18 was used for all analyses. Due to the internet survey mode of questionnaire delivery, data entry was essentially completed by the respondents. Once the survey period was over, all responses were compiled in an excel file which was imported into SPSS for analysis. Prior to analysis, all cases which were not in the study population were excluded. Because age information was not available from university registrar offices, a qualifying question was included in the survey. All participants outside of the age range of 18 to 24 years were removed from the data set prior to analysis.

Descriptive statistics were calculated for all statements. Cronbach's alpha was calculated for the macronutrient and total calorie construct as well as the specific nutrient construct to ensure reliability of these two measurement scales. There were four statements which made up the macronutrient and total calorie construct which asked respondents to rate the importance of the following nutrition information on restaurant menus when making menu selections: total calories, carbohydrate, fat, and protein. There were eleven statements which made up the specific nutrient construct which asked respondents to rate the importance of the following nutrition information on restaurant menus when making menu selections: calcium, cholesterol, fiber, iron, potassium, saturated fat, sodium, sugar, trans fat, vitamin A, and vitamin C. For these two constructs, a mean of all answered statements was calculated and that number was the score for that construct of nutrition information on restaurant menus. Cronbach's alpha was not determined for the health claim construct as it corresponded with only one item on the questionnaire as opposed to a measurement scale.

Descriptive statistics were gathered from the demographic data to better understand the composition of the sample. Responses to the height and weight items were used to calculate each respondent's BMI. The following formula was used to compute BMI:

$$BMI = \frac{Weight\ in\ lbs\ x\ 703}{(Height\ in\ inches)^2}$$

Once BMIs were calculated, values were assigned to weight classes according to the CDC (2010).

BMI	Weight Status
Below 18.5	Underweight
18.5 - 24.9	Normal
25 - 29.9	Overweight
30 & Above	Obese

Simple linear regression analysis was employed to explain the relationship between each construct and its relationship with purchase intention, independently. The first construct included total calories clustered with macronutrients (fat, protein, and carbohydrates). The second construct included all remaining specific nutrients (saturated fat, trans fat, cholesterol, sugar, sodium, dietary fiber, potassium, Vitamin A, Vitamin C, calcium, and iron). The third construct explored the relationship between health claims and purchase intention.

## **CHAPTER 4: RESULTS AND DISCUSSION**

### **Introduction**

Of the 745 students invited to participate in the study, 123 (16.5%) completed the questionnaire. 113 responses were in usable format. One of the issues with online surveys is a tendency for low-response rates; response rates for internet surveys have been cited to range from 6% to 75% (Leece, et al, 2004; Sheehan & McMillan, 1999).

### **Demographics of Sample**

The most prevalent ages of the respondents were age 20 (26.8%) and age 21 (22.8%). The sample was heavily dominated by female respondents (81.3%). This is plausible because the major of dietetics is heavily female dominated and dietetics students made up a substantial portion of the study population. The majority of respondents were White (79.7%) with 12.1% minorities which included the ethnic backgrounds of American Indian/Alaskan Native, Asian, and Multiracial. There were no African American respondents. This was somewhat expected as the sample was drawn from predominately White populations and majors which are not popularly chosen by African American students. The majority of the study sample had a BMI which indicated normal weight status (67.5%) with a total of 15.4% considered overweight or obese.

**Table 1. Demographics of Sample (N = 113)**

<b>Characteristic</b>	<i>N</i>	<b>%*</b>
<b>Age</b>		
18	5	4.1
19	25	20.3
20	33	26.8
21	28	22.8
22	17	13.8
23	2	1.6
24	2	1.6
<b>Gender</b>		
Male	13	10.6
Female	100	81.3
<b>Ethnicity</b>		
African American	0	0.0
American Indian/Alaskan Native	3	2.4
Asian	9	7.3
White	98	79.7
Multiracial	3	2.4
<b>Weight Status</b>		
Underweight	7	5.7
Normal weight	83	67.5
Over weight	16	13.0
Obese	3	2.4

\*Percentages may not total 100% due to non-response or multiple responses to the questions

### **Food Related Lifestyle**

The frequencies for food-related lifestyle items are presented in Table 2. The majority of respondents (63.7%) lived off campus indicating these students have access to a kitchen. Overall, 84.8% of the respondents had access to a kitchen regardless of campus living status. Though 17.1% respondents reported living on campus without access to a kitchen, less than half of those (8.1%) reported eating in restaurants as a necessity. These figures were expected to be in better alignment because if one does not have personal access to a kitchen it is probable that person may depend more heavily on away from home foods. The discrepancy between students reporting living on campus without access to a kitchen and those reporting eating in restaurants as a necessity may be due to a number of factors as follows.

Firstly, if different terminology were used to ask about influencers for eating out, responses may have differed. The survey item inquiring about student's reason for eating out was asked in the context of dining in restaurants. Perhaps the term 'restaurants' prompted respondents to restrict the inclusion of dining in certain food service establishments such as cafeterias. Secondly, there are unique living situations specific to college students that may have contributed to the incongruity. Students who live in Greek housing may not be allowed to utilize their kitchen as a cook might be solely responsible for all meal preparation. In such a case, a respondent would report living on campus without access to a kitchen and may or may not select dining out as a necessity thus contributing to the disagreement in responses.

Respondents reported dining out relatively frequently; 31.7% indicated eating out several times a week or more and 43.1% reported eating out about once per week. Josiam

and Foster (2009) found restaurant patrons dine out an average of once or twice per week; their sample consisted primarily of middle-aged women. The demographic examined in this study report a higher tendency for patronizing food service establishments.

College students' tendency to eat out frequently may be attributed to a unique set of factors such as lack of food preparation skills, lack of access to a kitchen, difficulty in cooking for a single person, convenience, and cost. With the propagation of convenience foods and the changing demographic of the American household, children at home are less likely to learn how to cook – which are skills that were once taught by parents and schools (Burkman, Balakshin & Klugman, 1995). Traditional college students who are living away from home for the first time may not have been adequately equipped with the skills needed for food preparation causing them to turn to food service establishments for nourishment. Perhaps those who are knowledgeable in food preparation find difficulty in cooking for only themselves or find their diet lacks variety when cooking for themselves propelling them to seek away from home food sources (Morse & Driskell, 2009). Also, college students are often very busy and might feel there is not enough time to prepare food at home. This combined with the convenience of purchasing food at restaurants and other food service establishments might also prompt eating away from home. Regardless of the reason for dining out, it is apparent the trend for eating out is prevalent in this population and restaurant marketers should target their efforts toward maintaining patronage and satisfaction among this demographic.

The most prevalent types of restaurants patronized were quick service restaurants (59.3%) and chain restaurants (60.2%). A small percentage of respondents (8.1%) reported patronizing fine dining establishments at least once per month. This finding is somewhat

foreseeable as college students often are on a budget which may limit their ability to dine in restaurants with expensive menu items and may influence their decision to dine at quick service and chain restaurants for their affordable dining options. Morse and Driskell (2009) report one reason for college students' patronage to quick service restaurants is because it's inexpensive.

**Table 2. Food Related Lifestyles**

<b>Characteristic</b>	<b>N</b>	<b>%*</b>
<b>Campus living</b>		
Live on campus with kitchen	26	21.1
Live on campus without a kitchen	21	17.1
Live off campus	66	63.7
<b>Influencers for eating out</b>		
Eat healthy at home	60	48.8
Eat in restaurants as indulgence	49	39.8
Eat in restaurants as necessity	10	8.1
<b>Frequency for dining out</b>		
At least once a day	9	7.3
Several times a week	30	24.4
Once a week	53	43.1
Once a month	25	20.3
Less than once a month	3	2.4
<b>Types of establishments patronized</b>		
Quick service restaurants	73	59.3
Chain restaurants	74	60.2
Fine dining	10	8.1
Bar and grill	52	42.3
Grocery deli	16	13.0
Entertainment restaurants	6	4.9
Cafeteria	47	38.2
Other	10	8.1

\*Percentages may not sum 100% due to non-response and/or multiple responses to questions

### **Importance of Nutrition Information and Health Claims on Restaurant Menus**

Internal consistency reliability estimates, mean ratings and standard deviations for nutrition information on restaurant menus are presented in Table 3. The mean rating for the importance of the provision of macronutrients and total calories when making menu selections was the highest, 5.40 (SD=0.43), of the three constructs and the mean rating for specific nutrients was the lowest at 4.87 (SD=0.47).

Total calories had the highest mean rating of 5.97 (SD=1.52) followed by trans-fat, 5.59 (SD=1.69); saturated fat, 5.51 (SD=1.67); and fat, 5.47 (SD=1.51). Previous studies have suggested consumers are particularly concerned with caloric and fat information (Josiam & Foster, 2009; Hwang & Lorenzen, 2008; Mills & Thomas, 2008). The restaurant industry plays a role in overconsumption of calories as restaurant foods have a higher caloric and fat content than foods prepared at home (Nestle & Jacobson, 2000). The key principle of weight management is caloric balance (FDA, May 2009); the inclusion of caloric content on restaurant menus enable consumers to take control of caloric intake in the restaurant setting which contributes to the nutrition component of weight management.

Mills and Thomas (2008) found consumers perceive saturated fat, fat and trans-fat extremely important in menu descriptions. Consumers place greater importance on fat than other key nutrients (Garretson & Burton, 2000). Fat is the most energy dense macronutrient; it yields 9 Calories per gram whereas both carbohydrate and proteins yield 4 Calories per gram. Therefore, items which have a high fat content may more prominently affect total calories than protein and carbohydrates. Because consumers have a tendency to underestimate fat content and saturated fat content on restaurant menus, the provision of such information can eliminate misconceptions (Burton & Creyer, 2004).

FDA has emphasized the importance of limiting saturated fat in the diet which may have led to increased consumer awareness (FDA, May 2009).

**Table 3. Internal Consistency Reliability Estimates, Mean Ratings and Standard Deviations for Nutrition Information on Restaurant Menus (N = 113)**

<b>Construct</b>	<b>A</b>	<b>Mean</b>	<b>SD</b>
<b>Macronutrients and Total Calories</b>	<b>0.88</b>	<b>5.40</b>	<b>0.43</b>
Total Calories		5.97	1.52
Carbohydrate		4.97	1.50
Fat		5.47	1.51
Protein		5.18	1.48
<b>Specific Nutrients</b>	<b>0.95</b>	<b>4.87</b>	<b>0.47</b>
Saturated Fat		5.51	1.67
Sugar		4.88	1.56
Trans Fat		5.59	1.69
Cholesterol		4.95	1.57
Sodium		5.38	1.52
Fiber		5.09	1.50
Potassium		4.26	1.38
Vitamin A		4.34	1.45
Vitamin C		4.46	1.44
Calcium		4.57	1.60
Iron		4.59	1.49
<b>Health Claim</b>			
Heart healthy claim		<b>5.09</b>	<b>1.49</b>

\*Scale for statements: 1=not important at all 2=not important 3=somewhat not important 4=neutral 5=somewhat important 6=not important 7=extremely important

### **Provision of Nutrition Information and Purchase Intent**

The model summary for the regression model is shown in Table 4. As indicated by the R square, 20.4% of total variance in purchase intention of restaurant items can be explained by the provision of nutrition information and health claims on restaurant menus. This is in alignment with research which indicates nutrition information may not always be used to make menu selections because nutrition attitudes and subsequent behaviors are influenced by multiple types of evaluative information (Crites & Aikman, 2005). Factors such as convenience, cost, mood, special occasions, and dining experience in addition to nutrition collectively play a role in consumers' food attitudes and behaviors (Crites & Aikman, 2005; Lando & Labiner-Wolfe, 2007; Narine & Badrie, 2007).

**Table 4. Model Summary**

<b>R</b>	<b>R Square</b>	<b>R Square Adjusted</b>	<b>Standard Error of Estimate</b>
0.451	0.204	0.178	0.287

The regression analysis for variables predicting purchase intent is presented in table Table 5. The presence of total calories and macronutrient information on restaurant menus was found to significantly affect purchase intention ( $p = 0.015$ ). In previous studies, researchers have found menus which include calorie and macronutrient information of items were perceived as most effective to convey nutritional content and the provision of this information influenced attitudes toward menu items (Hwang & Lorenzen, 2008).

The relationship between the provision of specific nutrients on restaurant menus and purchase intent was not significant ( $p = 0.38$ ). Though the provision of saturated fat and trans fat were found to be somewhat important to consumers, the inclusion of these

items in the scale did not yield a significant relationship between provision of specific nutrients and purchase intention. Potassium, calcium, vitamin A, vitamin C, sugar, and cholesterol had lower mean ratings which decreased the average and may have been more reflective of the lack of relationship found with purchase intention than saturated and trans fat.

The relationship between the provision of the heart healthy claim on restaurant menus and purchase intent was not significant ( $p = 0.49$ ). Researchers have generated contrasting findings related to the effect of the provision of health claims on purchase intention. In the packaged foods realm, when a product features a health claim people view the product as healthier and indicate they are more likely to purchase it (Roe, Levy & Derby, 1999). From an opposing viewpoint, Garretson and Burton (2000) and Keller et al. (1997) concluded health claims on packaged foods have no effect on nutrition attitudes or purchase intention and that consumers rely on nutrition information to a greater extent than health claims when making nutrition-related evaluations.

It appears the latter trend transfers to the realm of nutrition labeling on restaurant menus. Kozup, Creyer and Burton (2003) indicated the inclusion of a heart healthy claim on restaurant menus does not affect nutrition attitude and purchase intentions. In that particular study, the interaction between health claims and nutrition information on restaurant menus was emphasized such that when favorable nutrition information was provided, the inclusion of health claims reduced consumers' perceived likelihood of disease more so than when health claims were presented alone. Even though health claims may be useful to bring awareness to nutrient-disease relationships, it has not been found to

influence consumers' intent to purchase menu items with health claims. The current study did not find a significant relationship between health claims and purchase intention.

The findings of this study do not imply the provision of nutrition information can be solely responsible for determining purchase intention as indicated by the model fit summary. However, provision of total calorie and macronutrient information did have a significant positive effect on purchase intention whereas no such relationship was found between specific nutrients and health claims with purchase intention.

**Table 5. Regression Analysis for Variables Predicting Purchase Intent (N=113)**

<b>Variable</b>	<b>B</b>	<b>SE B</b>	<b><math>\beta</math></b>	<b>t</b>	<b>Sig.</b>
Total calories and macronutrients	0.06	0.02	0.27	2.49	0.02*
Specific nutrients	0.04	0.05	0.15	0.88	0.38
Health claims	0.03	0.04	0.11	0.69	0.49

\* Relationship found significant at  $p = 0.05$

## **CHAPTER 5: CONCLUSION AND IMPLICATIONS**

This chapter consists of two sections. A summary and implications of this study will be presented then limitations of this study and recommendations for future research will be discussed.

### **Conclusion**

The researcher found the provision of total calorie and macronutrient information influence college students' intent to purchase menu items. The researcher failed to find a significant relationship between the provision of health claims and specific nutrients and college students' intent to purchase food items. Total calories, fat, saturated fat and trans fat had the highest mean ratings for importance on restaurant menus. Restaurant menus have limited space to display information so a complete nutrition facts panel for every menu item is unrealistic. Therefore, it is imperative to know the nature of the information consumers find useful when making menu selections so excess information is not included needlessly. Industry professionals and marketers can use the results of this research to effectively and efficiently display nutrition information on restaurant menus.

### **Implications**

Though it may not always be used to make menu selections, consumers favor having nutrition information available in the restaurant setting (Lando & Labiner-Wolfe, 2007; O'Dougherty, et al. 2006). The nutrition content of healthful food options can be highlighted if nutrition information is made available. Likewise, nutrition content of less healthful options can be conveyed accurately with the provision of nutrition information on

restaurant menus. Regardless of whether the nutrition facts are favorable or unfavorable, having this information available to consumers enables informed decision making.

The findings of this study indicate total calorie and macronutrient information influence purchase intention in the context of restaurant menus, but specific nutrient information and health claims do not exhibit an influence on purchase intention. This can direct industry professionals to design restaurant menus to include calorie and macronutrient information of food items to highlight the nutrition content of such foods. Because fat content has consistently been rated as one of the most important nutrition factors restaurateurs seek, perhaps emphasis should be put on it. It is possible that with the universal provision of nutrition information on restaurant menus, consumers may generate increased concern for nutrition when dining out.

Currently, consumers tend to underestimate the amount of total calories and fat in restaurant food items (Burton & Creyer, 2004; Burton, Creyer, Kees & Huggins, 2006; Kozup, Creyer & Burton, 2003). Once consumers become aware of unfavorable nutrient levels in away from home foods, purchase intentions may decrease (Burton & Creyer, 2004). This, in turn, may influence food service establishments to increase the number of healthful alternatives made available to consumers.

The provision of nutrition information on restaurant menus can be viewed as a marketing tool to appeal to health conscious consumers who cognitively select and purchase foods. It may be seen as a form of superior service which can influence satisfaction and the dining experience – perhaps even attract new customers (Hwang & Lorenzen, 2008; Maestro & Salay, 2008).

### **Limitations and Future Research**

The population for this research study consisted of traditional undergraduate students majoring in hospitality management or dietetics at three land-grant universities. This narrow study population limits the generalizability of the findings of this study. Since dietetics students' course of study is oriented in nutrition, their ratings for the provision of nutrition information on restaurant menus may not be consistent with college students in other majors without an academic focus in this field.

Gender bias may be a source of error for this study due to the prodigious percentage of female respondents (81.3%). Though females have been found more likely to respond to surveys than males (Porter & Umbach, 2006), the field of dietetics is more heavily populated with females and may have been the main contributor for the gender bias in the sample. Future studies should involve sampling across college disciplines to reduce such gender bias in the sample.

Because this study examined the views of college students at two universities in the Midwest and one in the Northwestern region of the United States, the results may not be generalizable to students at land grant universities across the nation. The student bodies of participating universities were composed of predominantly white students (Iowa State University, Office of the Registrar, 2011; Oklahoma State University, Institutional Research and Information Management 2010; Washington State University, Institutional Research, 2011). Over 75% of survey respondents were white with reported 12.1% minorities. Among the minorities, there were no reported African American respondents. With no African Americans in the sample, the ethnic demographic properties of the sample do not reflect the study population and cannot reflect the views of the overall college

population. Therefore, future research should sample from more than other universities in geographically dispersed locations to help increase the ethnic diversity of the sample.

Data collection was accomplished for this survey using internet surveys. A low response rate was achieved – only 15.1% of students contacted returned surveys in a usable format. Due to Institutional Review Board restrictions of one of the participating universities, students in the sample were contacted a maximum of two occasions. Additional e-mails sent to non-respondents may yield a smaller nonresponse rate if this study is conducted again in the future. Also a mixed mode method of survey distribution has been cited to produce a more representative sample and higher response rates than an internet survey alone (Borkan, 2010).

The measurement scales used to assess the importance of nutrition information on restaurant menus when making menu selections was found reliable according to Cronbach's alpha. However, since only one item was used to assess the importance of health claims on restaurant menus when making menu selections, reliability of the item was not assessed. The relationship between the heart healthy claim and purchase intention was not found significant in this study, but that does not mean a relationship does not exist between health claims on restaurant menus and purchase intention. Future researchers should develop a scale that investigates a number of health claims instead of limiting it to the one heart healthy claim used in this study.

The relationship between the provision of specific nutrients on restaurant menus and purchase intention was not found significant in this study. Previous research, however, has indicated saturated fat and trans fat may have an impact on consumers' purchase intention (Mills & Thomas, 2008). People with health concerns may be increasingly concerned with

information related to sugar (diabetics); fat, sodium and cholesterol content (high blood pressure and heart disease); and overall caloric intake (obesity and diet maintenance) (Thomas & Mills, 2006). Future researchers could gather information related to specific health ailments to investigate whether the presence of such health issues might have an impact on their attitude toward specific nutrient content and/or purchase intention.

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## APPENDIX A. HUMAN SUBJECTS FORMS

**IOWA STATE UNIVERSITY**  
OF SCIENCE AND TECHNOLOGY

Institutional Review  
Office for Responsibl  
Vice President for Re  
1138 Pearson Hall  
Ames, Iowa 50011-2  
515 294-4566  
FAX 515 294-4267

**Date:** 11/4/2010

**To:** Kelly Mayfield  
31 MacKay

**CC:** Dr. Robert Bosselman  
31 MacKay

**From:** Office for Responsible Research

**Title:** Nutritional Labeling for Retail Foodservice Menu Items: College Students' Preferences for Nutrition Information and Its Influence on Purchase Intention

**IRB Num:** 10-466

**Submission Type:** New

**Exemption Date:** 11/1/2010

The project referenced above has undergone review by the Institutional Review Board (IRB) and has been declared exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b). **This determination is contingent upon receiving approval from other institutions before beginning research and providing a copy of the letter to our office.** The IRB determination of exemption means that:

- **You do not need to submit an application for annual continuing review.**
- **You must carry out the research as proposed in the IRB application**, including obtaining and documenting informed consent if you have stated in your application that you will do so or if required by the IRB.
- **Any modification of this research should be submitted to the IRB on a Continuing Review and/or Modification form, prior to making any changes**, to determine if the project still meets the federal criteria for exemption. If it is determined that exemption is no longer warranted, then an IRB proposal will need to be submitted and approved before proceeding with data collection.

Please be sure to **use only the approved study materials** in your research, including the **recruitment materials and informed consent documents that have the IRB approval stamp.**

Please note that you must submit all research involving human participants for review by the IRB. **Only the IRB may make the determination of exemption**, even if you conduct a study in the future that is exactly like this study.

February 17, 2011

RE: IRB #10-466

To Whom It May Concern:

Graduate student Kelly Mayfield has requested and received names and e-mail addresses of students from Washington State University in accordance with our policies related to the release of education records. Specifically, directory information, such as name and e-mail address, may be released without student consent provided that the intended purpose is non-commercial, is requested and documented properly, and the intended use is consistent with our policies. Since Ms. Mayfield's request met these conditions, we provided this information and have no objection to her use of this data for research, provided the Institutional Review Board at her home institution, Iowa State University, has also approved the use of this data.

If you have questions, regarding the above, please contact me at (509) 335-1139, or via e-mail at [backes@wsu.edu](mailto:backes@wsu.edu).

Sincerely,

Richard A. Backes  
Senior Associate Registrar  
Data Custodian, Student Records  
Washington State University

## OKLAHOMA STATE UNIVERSITY



Institutional Research & Information Management  
219 Public Information Office  
Stillwater, OK 74078-1042  
Phone: 405-744-4244 Fax: 405-744-4834  
Email: [osuirim@okstate.edu](mailto:osuirim@okstate.edu)  
Web: <http://vpaf.okstate.edu/IRIM/index.html>

January 31, 2011

Iowa State University  
Office of Responsible Research  
1138 Pearson Hall  
Ames, IA 50011-2207

Subject: IRB #10-466

Dear Dr. Robert Bosselman,

Oklahoma State University has received an Open Records Request per IRB #10-466 from Kelly Mayfield. She is asking for a list of the names and email addresses of full-time, undergraduate students, ages 18-24 currently enrolled in Dietetics, Dietetics & Exercise, Dietetics with emphasis in nutrition & exercise, and Hotel & Restaurant Administration. She had also requested gender information, but according to FERPA regulations, we are unable to provide this. All administrative areas within our university have granted approval to process this IRB.

Please contact me if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads 'Christie Hawkins'.

Christie Hawkins, Ph.D.  
Director

Cc: Kelly Mayfield

**APPENDIX B. QUESTIONNAIRE****I. Food Related Lifestyle**

**Which of the following describes you best?** (*Check one*)

- I choose to eat healthy at home rather than in restaurants
- I dine in restaurants as an indulgence
- I dine in restaurants as a necessity

**Which of the following best describes the frequency you eat at restaurants?** (*Check one*)

- At least once a day
- Several times a week
- Once a week
- Once a month
- Less than once a month

**Indicate the types of restaurants in which you dine at least once per month.** (*Check all that apply*)

- Quick service restaurants (McDonald's, Taco Bell, Subway, etc.)
- Chain restaurants (TGI Fridays, Denny's, Applebee's, etc.)
- Fine dining (formal dress code enforced)
- Bar and grill
- Grocery deli
- Entertainment restaurants (restaurants featuring live music or entertainment)
- Cafeteria (university dining establishment, workplace cafeteria, etc.)
- Other (*please specify*) \_\_\_\_\_

II. Nutritional information on restaurant menus

**Rate the importance of the following nutrition information on restaurant menus when making your selection:** *(Check one in each horizontal row)*

	Not import ant at all	Not import ant	Somew hat not importa nt	Neutr al	Somew hat importa nt	Import ant	Extrem ely Importa nt		N ot su re
Fat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Saturate d fat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Trans fat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Choleste rol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Total calories	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Sugar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Carbohy drate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Protein	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Sodium	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Dietary fiber	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Potassiu m	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Vitamin A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Vitamin C	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Calcium	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Iron	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

**If nutrition information is presented on a restaurant menu, will the amount of the following nutrients influence your decision to purchase the food item?**

**Fat**

- Yes, my decision to purchase the item is influenced by its fat content
- No, my decision to purchase the item is not influenced by its fat content
- I don't know

**Saturated fat**

- Yes, my decision to purchase the item is influenced by its saturated fat content
- No, my decision to purchase the item is not influenced by its saturated fat content
- I don't know

**Trans fat**

- Yes, my decision to purchase the item is influenced by its trans fat content
- No, my decision to purchase the item is not influenced by its trans fat content
- I don't know

**Cholesterol**

- Yes, my decision to purchase the item is influenced by its cholesterol content
- No, my decision to purchase the item is not influenced by its cholesterol content
- I don't know

**Total Calories**

- Yes, my decision to purchase the item is influenced by its total Calorie content
- No, my decision to purchase the item is not influenced by its total Calorie content
- I don't know

**Sugar**

- Yes, my decision to purchase the item is influenced by its sugar content
- No, my decision to purchase the item is not influenced by its sugar content
- I don't know

**Carbohydrate**

- Yes, my decision to purchase the item is influenced by its carbohydrate content
- No, my decision to purchase the item is not influenced by its carbohydrate content
- I don't know

**Protein**

- Yes, my decision to purchase the item is influenced by its protein content
- No, my decision to purchase the item is not influenced by its protein content
- I don't know

**Sodium**

- Yes, my decision to purchase the item is influenced by its sodium content
- No, my decision to purchase the item does not depend on the sodium content
- I don't know

**Dietary Fiber**

- Yes, my decision to purchase the item is influenced by its dietary fiber content
- No, my decision to purchase the item is not influenced by its dietary fiber content
- I don't know

**Potassium**

- Yes, my decision to purchase the item is influenced by its potassium content
- No, my decision to purchase the item is not influenced by its potassium content
- I don't know

**Vitamin A**

- Yes, my decision to purchase the item is influenced by its Vitamin A content
- No, my decision to purchase the item is not influenced by its Vitamin A content
- I don't know

**Vitamin C**

- Yes, my decision to purchase the item is influenced by its Vitamin C content
- No, my decision to purchase the item is not influenced by its Vitamin C content
- I don't know

**Calcium**

- Yes, my decision to purchase the item is influenced by its calcium content
- No, my decision to purchase the item is not influenced by its calcium content
- I don't know

**Iron**

- Yes, my decision to purchase the item is influenced by its iron content
- No, my decision to purchase the item is not influenced by its iron content
- I don't know

A restaurant menu item with low levels of saturated fat and cholesterol has a  symbol next to its description in the menu. The bottom of the menu page reads:

 Diets low in saturated fat and cholesterol may reduce the risk of heart disease.

**How important is this health claim to you in making a menu selection?**

- Not important at all
- Not important
- Somewhat not important
- Neutral
- Somewhat important
- Important
- Extremely important

**Will the presence of  this symbol influence your decision to purchase the item?**

- Yes, my decision to purchase the item is influenced by the presence of this symbol
- No, my decision to purchase the item is not influenced by the presence of this symbol
- I don't know

## III. Demographic Data

**What is your gender?**

- Male
- Female

**What is your age?** \_\_\_\_\_ years

**What is your classification?**

- Undergraduate student
- Graduate student

**What is your race/ethnicity? (Check one)**

- African American
- American Indian/Alaskan Native
- Asian
- Native Hawaiian/Pacific Islander
- Hispanic
- White
- Two or More Races

**Are you a U.S. citizen?**

- Yes
- No

**What is your marital status?**

- Single, never married
- Married
- Married and separated
- Divorced/widowed

**Do you live in campus housing? If yes, do you have access to a kitchen within your housing unit?**

- Yes, I live on campus and have a kitchen in my housing unit
- Yes, I live on campus but **do not** have a kitchen in my housing unit
- No, I do not live on campus

**What is your current height?** \_\_\_\_\_ft \_\_\_\_\_ inches

**What is your current weight?** \_\_\_\_\_lbs