

Surveying the Food Climate of Meredith College: A Qualitative Study

By

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## Surveying the Food Climate of Meredith College: A Qualitative Study

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### **Abstract**

*Obesity promotes an increased risk for disease such as diabetes, cardiovascular disease, and certain cancers. 74% of men and 64% of women in America are either overweight or obese<sup>1</sup>. Researchers are investigating when this weight gain begins to occur: during young adulthood<sup>2</sup>. A rapid weight gain is identified among college students<sup>2</sup>, but not many studies have suggested why this occurs. This research seeks to understand how transitioning to college life may contribute to changes in students' dietary patterns. Six focus groups were conducted to gain participant perspective of dietary patterns before and during college. A survey was then completed by Meredith College undergraduate students to gain a more specific understanding of participants' knowledge, attitudes, and beliefs about nutrition. Results from the focus groups indicated that increased independence contributes to nutrition confusion, fosters priority lineup, and increases focus on convenience in reference to diet. Further analysis developing an explanatory model revealed that all themes were interdependent with nutrition confusion being central. Results from the survey suggested that students aren't aware of necessary components of their diets and feel their diets represent healthy diets. Therefore, increasing nutrition knowledge may improve diets during the transition to college.*

## Introduction

According to the WHO “worldwide obesity has more than doubled since 1981.<sup>3</sup>” This is concerning because overweight or obesity can lead to deadly conditions such as heart disease, stroke, cancer, and diabetes.<sup>1</sup> Research supports that adult risk for cardiovascular disease and diabetes increases for people who are overweight or obese during early adulthood.<sup>4</sup> Specifically for college students, 61% are either overweight or obese.<sup>2</sup> Researchers are finding that weight gain among college freshman is considerably more rapid when compared to the rest of the population.<sup>5</sup> Also, females who move away to college gain up to 15% more weight than females who do not attend college.<sup>6</sup> Body mass index (BMI) has been found to change the most from ages 19-26.<sup>7</sup> Many researchers are currently exploring this phenomenon.

## Statement of the Problem

As diet-related health problems are becoming an increasingly worrisome issue, researchers are investigating possible sources of the problem. New information about rapid weight gain for college students is causing researchers to look at why this time of life triggers a decline in health. This transition from adolescence to young adulthood is crucial in developing behaviors that last throughout the rest of life<sup>8</sup>, so researchers are exploring the effect of transition on weight gain. There are many teams that have quantified the amount of weight gain, percentages of students affected, and amounts of healthy and unhealthy foods eaten<sup>2</sup>, but not many teams have suggested why the college lifestyle influences students to choose more unhealthy eating habits.

## Purpose of Study

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This research intends to suggest the relationship between previously identified unhealthy behaviors among college students and why college students develop these habits. This will be achieved through focus group discussion. The results will then be used to form a conceptual model for intervention and educational purposes. A survey, based on the model, will be offered to the entire Meredith College population to test the validity of the model. The conceptual model could be used as a guide to identify areas of improvement for college nutrition education. The results from the survey will serve as a more specific reference for deficits in nutrition knowledge, attitude, and behaviors among Meredith college students.

### **Significance of the Study**

By understanding how Meredith College students make their food choices, educators and food providers (dining hall services) can help students to develop healthier skills to avoid diet-related disease in late adulthood. They could use the conceptual model to teach students how the college lifestyle affects their food choices. Few studies addressing this topic exist, so other researchers could conduct similar studies to determine if these findings are generalizable to all college students.

### **Theoretical Perspective**

The grounded theory perspective for qualitative research was implicated in this study. Developed by Glaser and Strauss in the 1960s, grounded theory is based on observation about a phenomenon based on observation<sup>9</sup>. Charmaz created a subdivision of grounded theory called “constructivist ground theory<sup>10</sup>.” A constant comparative method is used by the research team by constantly switching between data collection and analysis. First open coding is implemented by the research team beginning preliminary analysis by grouping together common themes. Next the research relates categories to represent themes through a process

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called axial coding. Finally, the researcher organizes the themes in way that explain the theory in a process called selective coding.<sup>9</sup>

### **Research Method**

Research team conducted six focus groups to discuss how Meredith College affects food choices and habits. Dominant and emergent themes were discovered after transcription, coding, and theming. The themes were used to form a conceptual model. A survey questionnaire tested the conceptual model by asking questions about knowledge, belief, and attitude of nutrition for the whole Meredith College student body.

### **Meredith College Characteristics**

The participants of this study were only Meredith College undergraduate students. It is important to know the qualities of Meredith College because a main question of the study was “How does Meredith College affect your eating habits.” Factors that are important to the results of the study have been included. Meredith College is a private women’s college located in Raleigh, North Carolina. There are around 2000 undergraduate students.<sup>11</sup> There is one dining hall, Belk Dining Hall (BDH), with limited hours of operation. Monday through Friday they are open for breakfast from 7:30am-9:30am. There is continental breakfast from 9:30am-10:45am. Lunch is served from 11am-2pm, with late lunch from 2pm-4:30pm. Dinner is served from 4:45-7:30pm. On Saturdays and Sundays, continental breakfast is served from 8:30am-10:am, lunch from 11:30am-1:30pm, and dinner from 5:00pm-6:30pm. There is one café on campus called “The Beehive” is open from 7:30am-4:00pm. The Beehive serves more convenient options such as sandwiches, burgers, and snacks.<sup>12</sup>

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Meredith College freshman and sophomore students must live on campus in the dormitories unless they chose to live with their families and commute to school. An estimated 46% of the total undergraduate student population live in the dormitories.<sup>13</sup> Students are not allowed to have a microwave in their dorm rooms. However, there are microwaves, full refrigerators, stoves, and ovens in a common room on most halls. If students live in the dorms, they must also pay for meal plan for the Belk Dining Hall and the Bee Hive. Freshman can only buy the “unlimited meal plan”, which includes unlimited amount of visits to the dining hall and \$25.00 credit for Beehive purchases. All other students living in dorms pay the same price as the unlimited meal plan, but can exchange more Beehive Café money for fewer visits to the dining hall. The intention for all students living in the dormitories is to be able to eat all meals at either BDH or the Beehive.<sup>11</sup>

### **Summary**

Obesity is now considered an epidemic for Americans. A new focal point for a solution is weight gain among college students. However, there is not enough current research to suggest why college weight gain occurs and how it can be decreased. By using the grounded theory perspective, this research asks Meredith College students how the college lifestyle affects their diets. The results that are represented in a conceptual model can be used as an educational tool to help students develop healthier eating habits during college and hopefully decreasing their risk for the onset of chronic disease.

## Literature Review

### Nutrition Guidelines

In order to understand the implications of an unhealthy diet, it is important to understand the characteristics of a healthy diet. Every five years the Office of Disease Prevention and Health Promotion publishes nutrition guidelines for Americans after review of current research. According to the most recent publication in 2010 72% of men and 64% of women are either overweight or obese<sup>1</sup>. The status of overweight or obese is determined by body mass index or BMI. This is calculated by the amount of weight in kilograms divided by the height in centimeters squared. A BMI less than 18.5 is considered underweight, between 18.5-24.9 is normal weight, 25-29.9 is overweight, and greater than 30 is considered obese.<sup>14</sup> Body weight should be of major health concern; however, the publishers of the nutritional guidelines stress that malnutrition can also be a problem for those of a “healthy weight” so all populations should strive to meet the following nutritional guidelines.<sup>1</sup>

### General Recommendations

The publishers of the nutrition guidelines specifically advise women between the ages of 18-35 to consume between 1800-2400 kilocalories daily depending on activity level. This population should consume between 50-60% carbohydrates, less than 10% fat and between 10-20% proteins. One’s diet should contain a majority carbohydrates because they are the source for rapid energy in the body. Most Americans now consume many refined carbs like pasta and bread. More emphasis should be placed on carbohydrates sources like fruits and vegetables for lower calorie content with a higher concentration of fiber and vitamins. Protein provides amino acids that help build tissues and preserving body muscle. Sources of quality protein include beans, peas, nuts, seeds, soy, poultry, fish, beef, eggs, and dairy. Fat serves as a long-term

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energy supplier and exists in four forms: saturated, trans fat, monounsaturated, and polyunsaturated fatty acids. It is important to monitor the amount of macronutrients in the diet in order to ensure optimal health. 2.5 cups of vegetables and 2 cups of fruit are suggested for daily consumption.<sup>1</sup>

### **Foods to reduce/ increase**

There are some components of Americans' diets that the publishers advise to decrease and increase. The nutritional guidelines advise that sodium consumption should be no more than 2300 mg for the general population, consumption of less than 10% of saturated fat, consumption of less than 300 mg cholesterol, limiting trans-fat, reducing intake of added sugars and solid fats, and limiting refined grains and alcohol. They suggest increasing the amount of fruit and vegetables, whole grains, fat free milk, variety of protein sources, seafood, and using oils to replace solid fats.<sup>1</sup>

Currently Americans consume an estimated 3400 mg of sodium daily, exceeding the recommendation by 1100 mg. Excess salt intake can lead to an increased risk for cardiovascular disease. Research suggests that a low intake of sodium can lower the blood pressure, lowering the risk for cardiovascular disease development. They suggest reducing the consumption of processed foods and increase awareness of the sodium content in foods. Fat consumption is important for processes in the body like the absorption of fat-soluble vitamins. However, Americans overconsume this macronutrient. The nutrition guidelines suggest replacing solid fat with non-solid fat in order to reduce the risk for disease.<sup>1</sup>

Sugar can either exist as a natural ingredient of food or artificially added to foods. When sugar is added to food there is often no nutritional benefit. This is unlike the consumption of naturally existing sugar (example-fruit). They suggest reducing the intake of added sugars

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because the implication for weight gain. Refined grains do not contain as many vitamins, minerals, or dietary fiber as whole grains, so it is suggested to replace refined grains for whole grains. Excessive alcohol drinking may lead to liver cirrhosis, hypertension, stroke, type 2 diabetes, cancer of the upper gastrointestinal tract and colon injury. It is recommended that females consume no more than 1 serving of alcohol a day and men consume no more than 2 servings of alcohol daily.<sup>1</sup>

Fruits and vegetables should be increased because of their concentration of vitamins and minerals. They are also low in calories and have been linked to decreased disease risk. Meat provides vitamin B to the diet, but can also contain large amounts of fat. It is important to consume a variety of protein to the diet including plant-based protein and seafood. Research supports that seafood is a good source for omega 3 which is associated with lower incidence of cardiac-related deaths. The guidelines suggest increasing the consumption of potassium because of the association with decreased kidney stones and bone loss. Increasing dietary fiber intake can help with healthy laxation, satiety, and has been link to decreased risk for cardiovascular disease, obesity, and type 2 diabetes. Increasing calcium intake can prevent osteoporosis which is of special concern for aging women.<sup>1</sup>

The publishers also give guidelines to address the socio-ecological influences of diet suggesting that in order to make improvements, many factors must be considered. Living, working, and learning environments contribute to food choice. It is up to the individual to choose, but the environment can have an effect on the choices. They include this conceptual model to depict the affecters of food choice.

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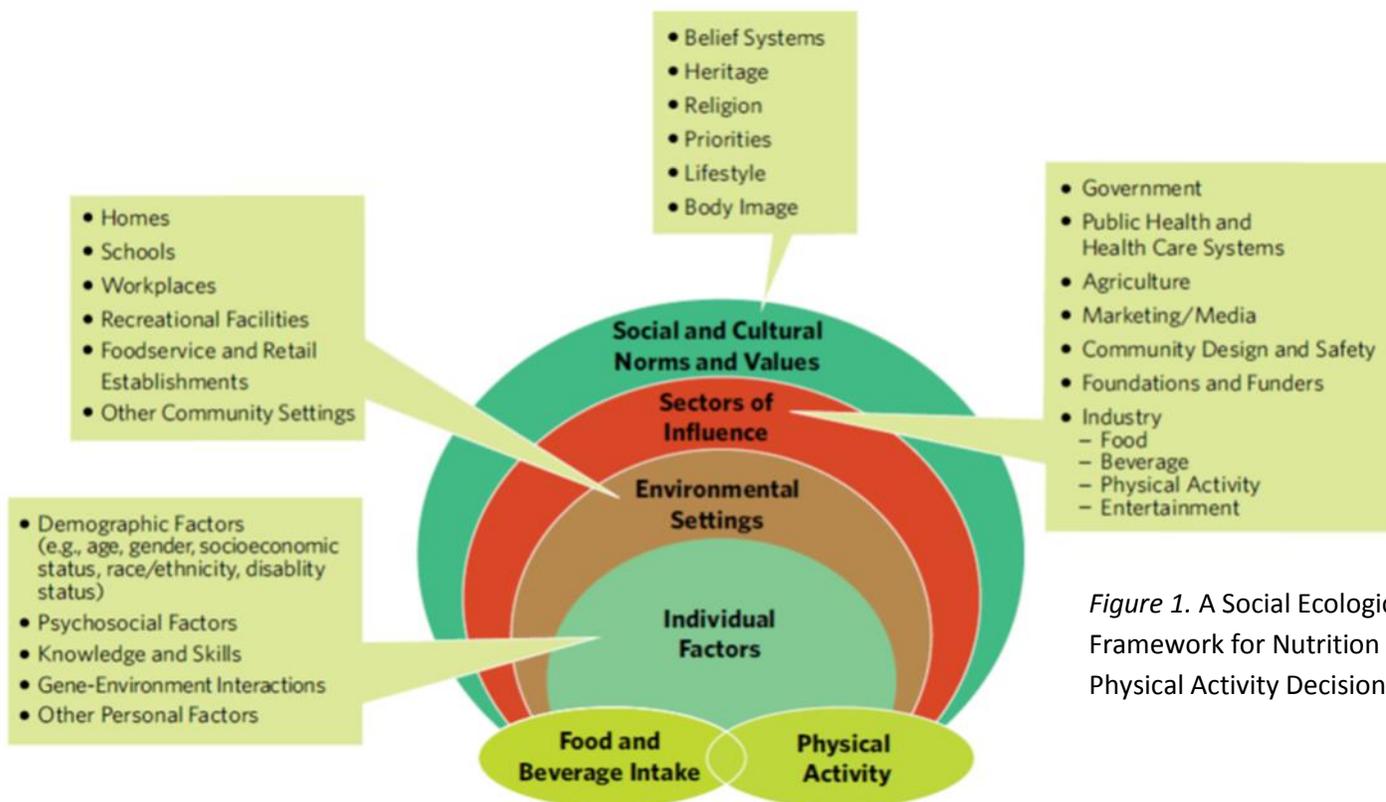


Figure 1. A Social Ecological Framework for Nutrition and Physical Activity Decisions

This model intends to explain the spheres of food choice. Individual factors such as knowledge and genetics are at the core. Next are the environmental settings- for example workplace and school. This can limit food availability or scheduling. The sectors of influence sphere can include media and government decisions regarding food regulation decisions. Social and Cultural norms and values deal with things like religion and heritage plays a role in food choices. All of these influencing factors work together to affect one's food choices. These factors' interaction in Americans' lives must be considered when researching how to increase healthiness for the population.<sup>1</sup>

Most of the foods Americans now consume are high in fat and calories but low in nutrient content. People are eating more now, without expending the excess energy through physical activity. In order to improve this, they suggest to increase the awareness of what,

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when, why, and how much people eat in order to improve diets. They also suggest deliberately making better choices for intake and seeking ways to be more physically active. People need to focus on eating more nutrient dense foods like vegetables, fruits, whole grains, fat-free or low-fat milk and milk products, lean meats and poultry, seafood, eggs, beans and peas, and nuts and seeds that are prepared without added solid fats, sugars, starches, and sodium.<sup>1</sup>

### **Implications of an Imbalanced Diet**

If these recommendations are not followed, diseases can occur later in life such as cancer, osteoporosis, cardiovascular disease, hypertension, diabetes, eating disorders, and weakened immune response.<sup>1, 4, 15-23</sup> 41% of the population has cancer. 1/3 of cancers (mainly breast, endometrial, colon, kidney, mouth, pharynx, larynx, and esophagus) are diet and physical-activity related.<sup>1</sup> Being overweight or obese increases risk for these cancers because the body produces more estrogen and insulin, which are hormones that stimulate cancer growth<sup>23</sup>.

It is estimated that one in every two women and 1 out of every 4 men over the age of 50 will suffer from an osteoporosis-related fracture.<sup>1</sup> Osteoporosis is the condition in which bones become weak and brittle. Consumption of adequate calcium before age 20 can decrease the risk for osteoporosis.<sup>18</sup>

Cardiovascular disease can be considered as any disease that affects the heart's muscle, valve, or rhythm. It is the narrowing or blockage of blood vessels that can lead to heart attack, chest pain, or stroke. The blockage keeps the brain, heart or other parts of the body from receiving enough blood. This disease is diet related because it is caused by a build-up of fatty plaque in the arteries, which can be caused by increased consumption of dietary cholesterol.<sup>17</sup> 37% of the population has cardiovascular disease. Risk factors include high levels of blood

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cholesterol, type 2 diabetes, metabolic syndrome, overweight and obesity, low levels of physical activity, and tobacco use. 16% Americans have high total blood cholesterol.<sup>1</sup>

Type 2 Diabetes is characterized by high blood sugar which causes insulin to become ineffective. The sugar comes from the diet in the form of carbohydrates. Type 2 diabetes is diet related. In type 2 diabetes the body does not produce insulin well, so the glucose cannot be absorbed. This causes a buildup of glucose in the blood. If left untreated this disease can cause damage to the eyes, kidneys and nerves.<sup>16</sup> The publishers of the dietary guidelines include that 11% of the population ages 20 years and older have diabetes with the majority being type 2. 35% of the population has prediabetes.<sup>1</sup>

Hypertension is the condition of high blood pressure. High blood pressure is measured by the amount of blood that heart pumps and amount of resistance to blood flow in the arteries. The more the heart pumps and the smaller the arteries, the higher the blood pressure. Hypertension can be symptomless, but can lead to heart attack or stroke. A major risk factor is being overweight or obese. The more weight on the body, the more blood the body needs to supply oxygen and nutrients to your tissues. As the volume of blood circulated through blood vessels increases, so does the pressure on artery walls.<sup>17</sup> 34% of the population has hypertension and 35% of the population has pre-hypertension. Excessive sodium intake, under consumption of potassium, and excessive alcohol intake contributes to hypertension.<sup>1</sup>

### **Eating Disorder**

Although overweight and obesity can contribute to deadly disease development, an underweight BMI can also contribute to some deadly eating disorders including bulimia, anorexia, and orthorexia. An estimated 24 million Americans suffer from an eating disorder.<sup>21</sup> Bulimia is characterized by a lack of control over eating large portions of food frequently. This

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results in a compensatory behavior as in vomiting, excessive use of laxative or diuretics, fasting, excessive exercise, or a combination of the behaviors. Those with bulimia typically maintain a normal body size. Some concerning symptoms are chronically inflamed and sore throat, swollen salivary glands in the neck and jaw area, worn tooth enamel, increasingly sensitive and decaying teeth as a result of exposure to stomach acid, acid reflux disorder and other gastrointestinal problems, intestinal distress and irritation from laxative abuse, severe dehydration from purging of fluids, and electrolyte imbalance (too low or too high levels of sodium, calcium, potassium and other minerals) which can lead to heart attack.<sup>21</sup>

Anorexia nervosa is characterized by eating very little because of obsession with body weight or size. If left untreated, symptoms can be thinning of the bones, brittle hair and nails, dry and yellowish skin, growth of fine hair all over the body (lanugo), mild anemia, muscle wasting and weakness, severe constipation, low blood pressure, slowed breathing and pulse, damage to the structure and function of the heart, brain damage, multi-organ failure, drop in internal body temperature causing a person to feel cold constantly, lethargy, sluggishness, and infertility.<sup>21</sup>

Orthorexia is not a disorder in the DSM5, but is still viewed as a diet-related disorder. It is characterized by having an unhealthy obsession with perfecting a healthy diet. Those with the disorder give themselves a very limited diet by concerning themselves with quality instead of quantity of foods. This disorder is especially interesting because it is suggested to result from the recent emphasis on health from the media.<sup>17 & 22</sup>

In relation to this study's population, 95% of those who have eating disorders are between the ages of 12 and 26. 25% of college-aged women engage in bingeing and purging as a weight management technique. 20% of the people suffering from anorexia nervosa will

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prematurely die from complication related to their eating disorder including suicide and heart problems.<sup>25</sup>

Disordered eating is not as severe as an eating disorder, but shares common characteristics. Some implications of disordered eating should be of concern because of the nutritional deficits<sup>20</sup>. “Normal eating” includes eating more on some days and less on others, eating some foods for taste, having a positive attitude towards food, not labeling foods with judgement words such as “good”, “bad”, or “clean”, overeating occasionally, under-eating occasionally, craving certain foods at times, and treating foods and eating as one part of a balanced life. Characteristics of disordered eating include binge eating, dieting, skipping meals regularly, self-induced vomiting, obsessive calorie-counting, self-worth based on body shape and weight, misusing laxative or diuretics, and / or fasting or chronic restrained eating beyond religious or cultural reasons. These habits are dangerous because they can lead to the previously mentioned diagnosable eating disorders. They can also lead to fatigue, malnutrition, or poor concentration. Disordered eating can affect someone's social life (when socializing is restricted due to anxiety around food/eating) and can lead to anxiety and depression.<sup>20</sup>

### **Adult Food Perceptions**

There is an increase in nutrition education and public awareness, but overweight and obesity levels are still increasing.<sup>1</sup> Research suggests that the adult population is confused by the nutrition information often because of the perception of a healthy diet from the media<sup>26</sup>. Nutrition education from media is creating an environment of nutrition confusion which leads to unhealthy food choices<sup>26</sup>. Media tends to focus on cholesterol and fat education causing participants to have misconceptions about other nutrition facts.<sup>27</sup> The correct nutrition information is misconstrued and could contribute to poor health choices leading to diseases in

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late adulthood. The following literature review explores to what extent the adult public knows about correct nutrition information and how it could be affecting their food choices.

A 1997 European study explored how the nutrition education affected eating behaviors. After interviewing participants about what a healthy diet should be, they received the following responses: 25% of the participants received health information from magazines. The participants who received their health information from health professionals gave a better definition for a balanced diet. 41% said that balance and variety influence their food choice, 35% said that habit influences their food choice, and 43% said that wanting to eat healthy was the biggest influence to their diet. The participants admitted excluding fruits and vegetables from their diets and did not consider fat to be a part of a healthy diet. This study suggests that nutrition education is too general which leads to confusion about nutrition.<sup>26</sup>

One study found that adults perceive fruits and vegetables are healthy, but not grains and dairy. Some participants said that meat should dominate the diet while others said that meat should be completely excluded. However, the majority of the participants did state high fructose corn syrup should be excluded from the diet. The researchers suggested that this could be because of marketing against high fructose corn syrup.<sup>26</sup>

Diekman et al explored this topic by asking their participants about fats. They found that there was confusion among the public about the differences between the types of fats, the role of healthy fats, and that overall there was a negative association with the macronutrient. They suggest that this confusion could contribute to the obesity epidemic when using nutrition knowledge to make food choices.<sup>29</sup>

Oakes et al explored the dichotomous thinking that the public has seemed to develop about food. They knew from other research that the media often labels foods as either bad or

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good. Now the public is starting to develop a more dichotomous attitude towards food instead of analyzing the nutrition content for themselves. Healthier foods (whole fruits and vegetable) often do not have labels identifying or advertising their health benefits. This causes people to believe that other foods that are labeled as having health benefits are actually healthier than the other foods. For example, if a bag of vegetable chips claim to lower cholesterol, the study suggests the shopper will believe that the vegetable chips have more health benefits than actual vegetables because of the advertised health claim. They tested this by asking participants choose the healthier option between a pie and oatmeal. The oatmeal was overall less healthy than the pie, but the participants did not know how to analyze nutrition labels. They chose the oatmeal as more healthy because of the perception of oatmeal from the media. This study suggests that consumers need increased education about food labels to determine nutritional content for themselves.<sup>30</sup>

A Swiss study further tested the ability of their participants to make healthy food choices and found that participants had difficulty with defining a balanced diet. Their participants believed that vitamins were sufficient to support a healthy diet, were confused about the role of fat, and thought that replacing whole fruits and vegetable with juices is acceptable for a healthy diet.<sup>31</sup>

Carles et al found that the public generalizes healthy and unhealthy foods too much. Their participants said that healthy food is characterized by fewer calories while unhealthy food is characterized by a higher fat content. This study also suggests that non-dieters and dieters differ in their perceptions of food. Dieters are more concerned about the fat and calorie content, while non- dieters are more worried about the freshness of the foods. Non-dieters were more inaccurate at estimating the calorie content of foods. They found no difference

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between the estimation of calorie content between overweight and normal-weight people. The main findings of this study suggest that dieters and non-dieters perceive the healthfulness of foods differently and that the public characterizes the healthfulness of food by fat content or calorie content<sup>32</sup>.

A more recent study suggests that the public is now more concerned with freshness over fat content.<sup>14</sup> The researchers asked grocery shoppers about their health concerns when choosing healthy foods. The participants considered fat content and freshness as their highest concern, while protein, calorie, and vitamin content were of lowest concern. This study provides an understanding of how consumers use nutrition information to help choose healthy foods.<sup>14</sup> These findings are supported by Oakes et al's study results. Their participants thought that fat, cholesterol, and sodium amounts decreased as the healthfulness of food increased. They also thought that increased fiber, vitamin, mineral, and protein content promoted the health value of foods. These results suggest that these are the aspects that consumers analyze when thinking about the healthfulness of foods. However, consumers may not understand the health value of fat and carbohydrate content.<sup>33</sup> Oakes et al's later study suggests that some people are even starting to lose the general concepts of nutrition. Their participants were more likely to associate a potato with carbohydrates rather than being a vegetable.<sup>27</sup>

There are many studies that aim at finding the disconnect between the provided nutrition information and nutrition perception as it relates to the rise in obesity and eating disorders within the older adult population. However, there is little research to suggest why this trend also exists among college students. Unhealthy weight gain does occur among college students and some factors contributing to this have been identified, but not to the extent as for the older adult population.

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### College Student Focus

#### Introduction

Diet should be a concern for the entire public, but research is finding that young adults are of special concern. Research suggests that the greatest amount of weight gain throughout life happens between the ages of 18-29.<sup>34</sup> Within that age range, there is a greater weight gain during the ages of 18-24, which is the time many students make the transition to college<sup>34</sup>. College is a time of many changes resulting in experimentation and self-identity development<sup>8</sup>. Students develop health behaviors that could have great implications on their overall health in later adulthood. Researchers are exploring why this phenomenon exists among college students by exploring the social and physical factors that may contribute to this decline in health.

#### Transition into Young Adulthood

The transition into young adulthood is a critical time for self-exploration and identity development.<sup>35</sup> Examples of transitions are living independently, starting a job, or forming new peer groups.<sup>35</sup> The beginning of early adulthood also frees people from many legal restrictions. For example, young adults are able to decide without the consent of their parent after turning 18 and can choose whether to drink after turning 21; whereas the law or their parents previously influenced much of their lives.<sup>8</sup> This causes increased stress and instability because of new financial, health, and life responsibilities.<sup>8</sup> For those young adults who go to college (about half<sup>2</sup>), different problems arise such as moving to a new city, managing classwork, and living on a low budget.<sup>35</sup> Students create coping mechanisms to deal with this stress that may affect diet.<sup>34</sup> Those that eat in response to stress (emotional eaters) are found to be associated with overweight, obesity, and binge-eating disorder.<sup>34</sup> Failure to adapt to these stressful situations can result in unhealthy eating habits.<sup>35</sup>

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The habits that are developed during young adult life are especially important because research shows that these habits are the least likely to change throughout the rest of one's life.<sup>2</sup> Negative food choice behaviors that are learned in young adulthood can turn into habits in older adulthood that become difficult to change.<sup>36</sup> One study found that some of the habits that contribute to cardiovascular disease (worsened diet, smoking, and drinking alcohol) formed into habits during college.<sup>36</sup> The study suggests habits that may contribute to other diseases such as cancer, hypertension, and diabetes, are being formed in college because of the increased responsibility and choice.<sup>36</sup> They suggest that these behaviors may form because of the increased experimentation during the time of complete independence. College students use the habits and information influenced by their family to now make their own choices about their health, which could have a negative or positive impact throughout the rest of their lives.<sup>34</sup>

### College Student Nutrition Knowledge Aptitude

A review of European research studies assessing adolescent nutrition identified major gaps in understanding. They know that nutrition knowledge affects behavior. They found that adolescents have difficulty using the nutrition information they know to make healthy food choices. Availability, cost, influence of peers, parents, hunger, and health concerns affect their food choices. However, taste is the major influence for this population. They suggest that the major gaps in nutrition understanding for adolescents are a lack of understanding regarding the role of eating attitudes, food choices, and food preferences. They suggested that research should be conducted to correct the lack of harmonized and comparable data on physical activity and physical fitness, lack of comparable data about obesity prevalence and body composition, and lack of comparable data about micronutrient status.<sup>2</sup> If these misconceptions are not

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corrected before young adulthood, it could result in unhealthy food choices and disease later on.

### Habits Formed in College

Research suggests that the lack of understanding causes negative diet behaviors during college. For example, one study recorded that only 6% of students eat the recommended amount of vegetables (5 servings).<sup>37</sup> Nelson et al concluded that their college participants ate less than one serving of vegetables per day.<sup>2</sup> One study suggests that young adults eat less than one serving of fruits and vegetables per day.<sup>1</sup>

Many studies identify that dining halls, snacking patterns, and increased consumption of high-fat junk foods could contribute to forming unhealthy habits.<sup>2,24</sup> Because of the decline in home-cooked meals, breakfast consumption decreases and more convenient meals are sought.<sup>2</sup> For example, fast food consumption and soft drink consumption are highest during this stage of life. Fast companies are aware of this and make ad campaigns that specifically target young adults.<sup>2</sup> Crombie et al suggests that 43% of college students increased vending purchases, 50% had increased alcohol consumption, and only 58% considered calories or nutrients when choosing foods.<sup>34</sup>

Another study identified cause of the decline in health as the decreased amount of physical activity contributed to weight gain. More sedentary activities like increased amount of school work, class time, and computer time increases in college.<sup>2,24</sup> Crombie's upperclassmen participants' exercised less than their underclassman participants, suggesting that physical activity decreases more throughout college.<sup>34</sup> Other behavior-related associations were attributed to increased substance abuse and drinking alcohol, worsening sleep habits, and increased stress.<sup>37</sup>

## Surveying the Food Climate of Meredith College: A Qualitative Study

### Weight Gain and Eating Disorders

All of these poor food choices are causing negative health implications. High school students with a higher BMI typically gain more weight when they come to college.<sup>34</sup> Nelson et al found that 13% of their 10,000 young adult sample became obese, while 1.6% went from obese to not obese<sup>2</sup>. In the spring of 2010, about 40% of college students were overweight and 11.6% were obese<sup>37</sup>. One study suggests that the prevalence of overweight and obesity increased from 15% to 23% from freshman to senior year.<sup>34</sup>

Many researchers have focused on weight change among college freshmen. Crombie et al found that for the first year of college, there is an average weight gain between .7-2.4 kg<sup>34</sup>. One study conducted among Cornell University students resulted in their participants gaining an average of 1.5-1.8 pounds during the first 3-4 months of college.<sup>38</sup> Another study at Kent State University concluded that 38.4% of their college freshman had a weight gain mean of 9.4 lbs.<sup>24</sup>

Nelson et al identified that there was a 70% gain weight within the first 2 years of college.<sup>2</sup> Crombie et al suggests that weight gain stabilizes sophomore and junior years of college but the loss of lean muscle mass continues, being replaced by body fat. This means that even though the weight isn't increasing, health is still decreasing.<sup>34</sup>

This population is at a higher risk for disturbed eating behaviors. 59% said they tried to prevent weight gain.<sup>37</sup> Research has found that 15-25 year old people have a twelve times higher death rate from an eating disorders than other disorders.<sup>25</sup> Some of the characteristics of their eating disorders include intake restraint, being emotionally disinhibited, bingeing, and night eating. Many have weight, shape, and eating concerns. This could mean abiding by a strict diet and controlling body weight and shape through inappropriate compensatory behaviors. College students have many more sociocultural body expectations because of their peers and the

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media. Females focus more on weight loss and body image. 1/3 of Quick et al's college participants were involved in compensatory weight behaviors.<sup>35</sup>

The development of negative eating habits can result in over or undereating. This can lead to deathly diseases for younger people such as diabetes and eating disorders. In fact, cardiovascular disease is now diagnosed in younger populations with more body fat.<sup>1</sup> Some researchers are exploring why the college lifestyle supports these negative habits.

### Effect of College on Negative Dietary Habits

A slowing metabolism because of ending puberty is related to college weight gain, but other behavioral changes have been found as well. One study found that the increased access to unhealthy food and drinks in buffet-style dining halls and fast food restaurant placement around campuses may lead to an increase in chronic disease in young adults.<sup>39</sup>

One research team compared living off or on campus. They found that the only significant difference was for those who were identified as restricted eaters and lived on campus. They defined restricted eating as choosing to limit intake. These participants gained more weight throughout college. When students moved off campus, they realized a loss in body fat and accumulation of fat-free body mass.<sup>34</sup>

Overall, the participants that were identified as restricted-eaters (those who choose to not eat or eat less at times) were more likely to lose their restraint, be overweight, and gain more weight throughout college compared to those who do not restrain their eating. However, another study found that restricted eaters are actually more likely to lose weight and develop eating disorders. These findings suggest that restraining intake had unhealthy implications either way.<sup>34</sup>

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Research suggests that younger adults are motivated to eat healthy because of effects in physical appearance, while older adults are more concerned with the effect of the diet on disease prevention.<sup>33</sup> For example, one study suggests that older adults consider sodium content to be very important because of its contribution to high blood pressure.<sup>14</sup> Another study suggests that college-age people usually make judgements about the healthfulness of foods that are based more on reputation rather than nutrient content.<sup>27</sup>

Health campus 2020 is a resource for educators to use for overall health education for college students. They review current research about health topics and develop teaching strategies. They found that nutrition for college students is determined by multiple factors including public policy, community, institutional, interpersonal, and intrapersonal factors.<sup>37</sup>

### **Summary**

These studies identify some of the causes for how college weight gain occurs, but not many address why college students choose these unhealthy habits. Nelson et al state that little research about weight-related behaviors of college students has been conducted.<sup>2</sup> Now that the factors contributing to an unhealthy college diet are identified, knowing why college students choose these unhealthy habits could decrease the incidence of overweight, obesity, and eating disorders. The purpose of this study is to explore the deeper meaning behind why college students develop unhealthy diets.

## Methods

### Focus group

Research team completed an 8 hour Citi ethics training to inform the interview guide, IRB approval form, consent form, and survey. The training focused on social/ behavioral training. The topics of this training include the following: history and ethical principles, defining research for human subjects, federal regulations, assessing risk, informed consent, privacy and confidentiality, research with children, vulnerable subjects, and conflicts of interests involving human subjects. In order to be considered adequately trained, the research team read passages and passed quizzes with 80% accuracy.

After completing the ethics training and literature review, the research team created the semi-structured interview guide for the focus groups. The questions were formed to fill gaps in previous literature pertaining to knowledge, attitude, and belief. The intention was for participants to compare their diet before college compared to after college, and also for them to analyze what may have caused these changes. There are 4 main questions, each with mandatory probes and consistent optional probes. The interview guide is as follows:

Main Question	Require Probes
1. Describe your typical diet before coming to college.	-Eating at home vs. Eating out? -Who cooked? Planned meals? -Variety? -What affected your food intake back then?
2. What dietary changes have taken place throughout your time in college?	-Fruits and vegetables? -Variety? -Dining Hall? -Eating out? -Snacking?
3. How does college lifestyle affect your eating habits?	-How does weight affect your food intake? -How does physical activity affect your diet? -How does alcohol and/or drug intake

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	<p>affected your food intake?          -How does stress affected your diet?</p>
<p>4. What does a healthy diet look like to you?</p>	<p>-How do you maintain your health?          -What barriers do you face to eating healthy?          -What makes you want to eat healthy?</p>

Following the drafting of the interview guide, the research team created the consent form to combine with the moderator guide for institutional review board application. The possible harm from this study was identified as other participants sharing personal information about other participants outside of this study. The participants could also have had negative associations with food which may have made them feel uncomfortable with sharing. Vulnerable participants younger than eighteen years of age were excluded from the group.

The research team recruited participants through email, personal text message, and asking in person. Convenience-snowball sampling was implemented by forwarding recruitment emails by class presidents, teachers, department heads, and through each class's email manifestos. Other participants were contacted through personal text message. Agreements to participate were recorded on a spreadsheet where each name was represented by a number to maintain confidentiality. Those who agreed to participate received an email with an introduction to the research study and an invitation to review the consent form before signing.

In order to increase participation, a room at Meredith College was used to conduct the focus group. This room was selected because of the great amount of natural lighting and the formation of the tables. The tables were assembled in way that the participants were all facing each other in close proximity. The room was also small which created more intimacy and a more comfortable environment for discussion. Principle investigator taped a sign to the door

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indicating the room reservation and the door was locked at the beginning of the focus group in order to avoid interruptions and keep data confidential.

At the beginning of the focus group discussion, the principle investigator gave an introduction to the purpose and shared the rules of the discussion. Participants were asked to sign the consent forms and complete a demographic information sheet. They could not participate if they did not sign the consent form. The note recorder sat in the corner of the room and wrote notes throughout the entire discussion. The principle investigator started the recorder and asked the first question. Principle investigator minimally commented in order to maintain neutrality. Probing questions were asked if topics that had not yet been addressed. Conversation was allowed to exceed the intent of the question as long as it pertained to the general nature of the study (surveying the Meredith College food climate). Each question was planned to last around ten minutes to total between 50-60 minutes for the entire focus group discussion. Principle investigator concluded the group by reviewing questions and asking for final comments on each of the questions.

Within 15-20 minutes of the conclusion of the focus group, the principle investigator conducted an initial analysis. Notes from the focus group were reviewed and then general themes from each focus group were recorded for the initial analysis. This was later used to compare between groups.

Research team transcribed each focus group discussion utilizing a 3-pass transcript method. This was completed by listening to the recording through windows media player and typing everything that was heard without stopping. This was repeated until the discussion was completely transcribed verbatim. Occasionally, inaudible words were labeled on the

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transcription as “inaudible.” Filler words (um, well, and like) were also excluded for more efficient analysis.

There were two main sets of data collection. The first occurred after the first two groups in June 2015 and the second was after the last four focus groups in August and September of 2015. For the first analysis, the research team themed the transcript by summarizing every sentence with an action statement. The action statements were written in the margins of the hard copies of the transcripts. Sentences that could not be understood or did not relate to the project were not themed. Research team analyzed statements for overarching relationships. When relationships were found, they were recorded on a separate document. The research team practiced code collapsing to develop the overarching theories. Using the relationships between the three new themes, the principle investigator created a conceptual model. Connections were made between each of the themes and displayed in the model.

After initial themes were developed, the interview guide was revised in order to best accommodate the participant perspectives collected during the focus groups. Because the themes had already been determined, questions specific pertaining to the themes were then asked. More specific questions about coping mechanisms, location of residency, and extent of convenience eating were included. Topics that were introduced by previous focus groups were asked again to determine relevance for all participants. For example, the first two focus groups heavily discussed a decreased income greatly affecting their diet. The principle investigator introduced this topic to the other groups, but did not receive as strong of a response. Although this did not change the construction of the conceptual model, it did lend to a better understanding of what students are affected by a decreased income. After each of the last four focus groups, the interview guide was further altered in order to gain a better understanding of

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how the themes apply to the participants for the following focus groups. The dominant emergent themes did not change throughout the course of data collection, but including more questions did give greater versatility to the conceptual model by how it can apply to the different types of Meredith college students.

### **Survey**

Item writing for the survey was completely based on the themes from the focus group results. After complete analysis of the focus group discussions, the principle investigator created questions to test the generalizability of the conceptual model for the entire Meredith College undergraduate student population. Questions were included to specifically to address each theme of knowledge, convince, and priority. The survey consisted of likert-scale questions to determine the attitude and belief of nutrition convenience and priority. Multiple choice and comment-box questions were included to test basic nutrition knowledge. The research team included a final question about how Meredith College can help the students to improve their intake with the purpose of generating ideas for nutrition education.

The survey was intended to be between 5-10 minutes in order to reduce participant burden. The survey was created on the online database qualtrics. Research team created a consent form to address the concerns of participating in the survey highlighting the considerations of online surveys. The survey was created so that every question must be answered in order to answer the next question. Participants were not allowed to proceed with the survey if she did not agree to the consent form or was not between the ages of 18-22 (these two qualifications were included as survey questions). Upon IRB approval, the survey was sent via email to all Meredith college students. Only Meredith College undergraduate students ages 18-22 were invited to participate. The invitation email contained the directions and the link to

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the survey at the qualtrics website. The survey was open for one week. Three days after the initial release, the principle investigator sent a reminder email with the survey link attached and an announcement of the closing date of the survey.

The qualtrics program provided statistical analysis of the multiple choice and likert-scale questions. The research team utilized the answer choice percentages per question graphs, means, and standard deviations provided to analyze these answers. The percentage of correct answers for the nutrition knowledge questions suggested the level of nutrition knowledge of the participants. This data was analyzed quantitatively by looking at the answer with the highest percentage chosen. The research team noted if the participants mostly chose the correct or incorrect answers. The means of the likert-scale questions were analyzed to determine the level of attitude or belief about nutrition. The mean was noted as to how much most of the participants agreed or disagreed with the statements. However, the standard deviation of the responses suggested how accurate the responses were for all of the participants. If the standard deviation was very high, the research team understood that more responses for that question varied and could not suggest as strong of a response to be generalized for all of the participants. If the standard deviation was low, the mean response could be understood as representative of opinion of the majority of the respondents.

The comment-box questions were analyzed using content analysis to determine dominant emergent themes. First the responses for the sources of protein were categorized by the quantity of each exact answer. This was recorded on a separate spreadsheet. The research team practiced collapse coding by determining overarching themes of the responses by accuracy and amount of varied responses between animal and plant-based protein. The themes were reported in percentages. Similar strategy was used for the nutrition information source

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question. First the responses were categorized by amount of each, and then relationships were found between the answers considering the amount. If there was a high amount of responses about using the internet, the other answers were analyzed for how they could relate to this. Final analysis separated the responses by either credible or non-credible nutrition information sources. The responses for the final question about how Meredith College can promote positive diet for the students was analyzed by quantity of the type of responses and then collapse coding to relate the responses. A key phrase for this question was “dining hall,” so content analysis determined relationship to this phrase. Dominant themes for this question were developed into either improved dining hall service improvement or increased nutrition education.

## Results

### Focus Group

#### Sample Characteristics

This sample contained 6 focus group (35 participants) of 100% women. The participants varied in declared major with the majority having a foods and nutrition degree (7 participants). This was intentional because there was a separate focus group for nutrition majors in order to decrease intimidation for less-knowledgeable participants. The research team suspected that excluding these participants from the rest of the focus groups would promote greater discussion of the participants that were less knowledgeable about nutrition. Separating the nutrition-major participants also allowed for more in-depth analysis. Exercise and sport science had the next highest amount of participants (3). The age distribution (18-22 years) was average ranging from 20-25% for each except for only 3% being 22. 77% of the sample was caucasian and 14% was african american. The senior class (class of 2016) provided the highest amount of participants: 35%. The smallest percentage of class distribution was 3% which represents one participant who had already graduated. She was included in this sample because that focus group was conducted during the summer, before she transitioned into post-college life. 85% of the participants are from North Carolina, with one each being from Maryland, Florida, New York and 2 from Virginia.

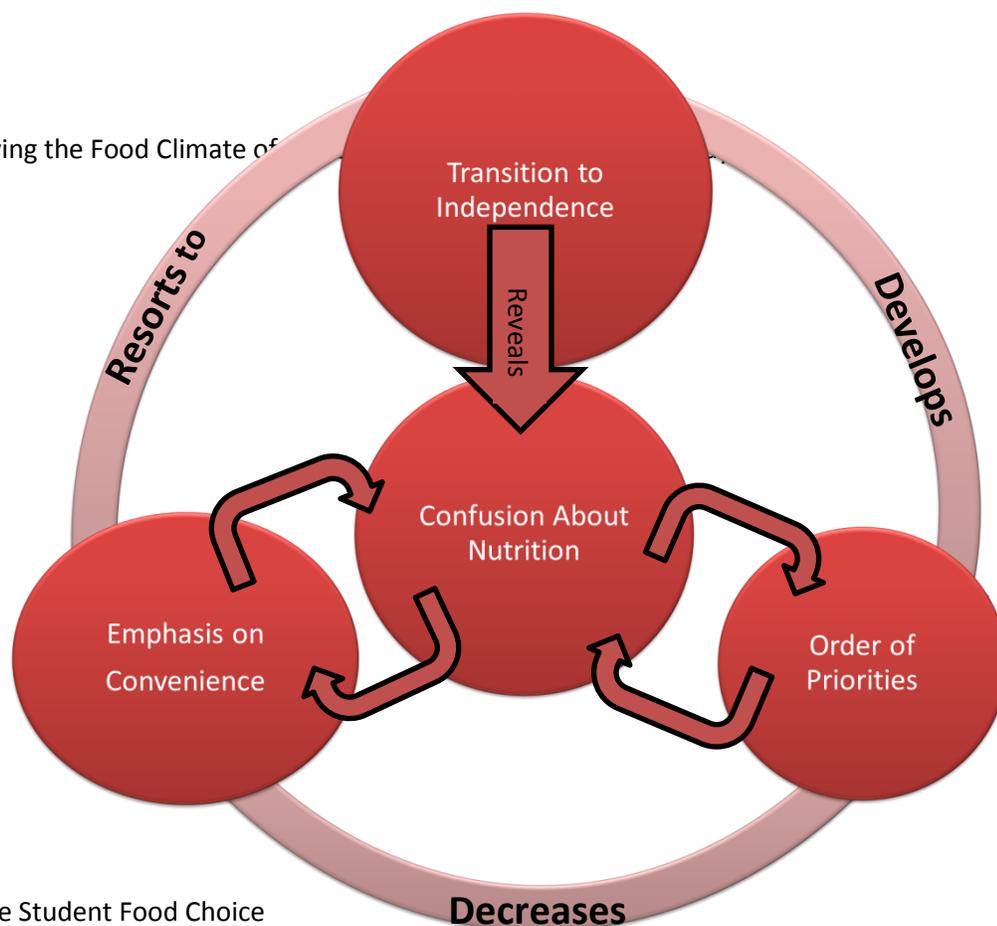


Figure 2: Meredith College Student Food Choice Model

### Dominant Emergent Themes

The dominant emergent themes from this study are as follows: confusion about nutrition, order of priority, and emphasis on convenience. The conceptual model suggests that an increase in independence (starting college) is associated with each of these three themes. The participants discussed leaving an environment where their families cooked, planned, and paid for all the meals, to an environment where they have to plan, prepare, and buy food for themselves now. They talked about how at home they did not have to choose their intake; they ate the food that their parents prepared. Now in college everything is a choice for them. One participant from the nutrition major group stated,

*"I mostly relied on someone else. And then I worked in a restaurant and so you know, I would always maybe pick up dinner or something there. So it would*

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*always be the restaurant that I worked at, my mom, or grandparents from a Sunday lunch leftovers. Usually someone else. And then sometimes I would make my own. Now I make more of my own."*

The transition to independence reveals confusion or current knowledge about nutrition. In terms of this study this is defined as either believing incorrect knowledge about nutrition or having no nutrition knowledge. As students leave their families, they now have to choose for themselves what to eat. They have to decide factors like cost, availability, effort, and nutritional value. In order to pick a healthy option they have to use the information about nutrition they have learned. Now that they have to make these choices, and they realize that they either are incompetent or confused about nutrition. Some of the examples from the focus groups were: using body image is indicator for health status, salad is the only healthy option in the dining hall, and more physical activity allows for a more unhealthy diet. One participant from the junior group said,

*"Same here. I never eat breakfast. Whether that's bad or not I don't know."*

However, some of the participants did display competent nutrition knowledge, but they still indicated a change from high school. The theme of knowledge in this conceptual model is one of the most important, because the amount of knowledge the participants exemplified about nutrition also seemed to affect the other emergent themes.

The transition to independence also develops the order of priorities. While living with their families, the participants did not have to prioritize their food choices in terms of costs, availability, and nutrition. They said they ate what was provided by their parents. College student now have to develop their priorities, which can affect their diet either negatively and positively. If they prioritized nutrition higher, then they discussed making better food choices.

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This was talked about as taking a break in the day to eat, spending more money on more nutritious food, or taking time to cook more nutritious food. If the participants prioritized nutrition lower, they discussed making worse food choices. After being asked why students may prioritize grades over health one participant from the freshman class group stated,

*“I think that’s what we’re supposed to do and what we’re expected to do. I guess our grades are going to last forever. If we’re not feeling well for now. In a few weeks from now, we won’t really be [not feeling well anymore]. It doesn’t really make sense.”*

When diet was discussed as having a lower priority, the participants chose less nutrition foods. For example, choosing taste over nutrition, choosing to study instead of eating, spending money on other items instead of food, or skipping breakfast to sleep in. School, social life, and finances were all identified as having priority over nutrition.

A transition to independence also resorts to either a high or low emphasis on convenience. In terms of this study, convenience of diet is defined by foods that take less time, effort, or money. Before college, the participants did not factor in convenience because of the increased availability of food. Either their parents went grocery shopping or cooked all their food. Now that students have to make time to do these tasks, convenience of eating becomes a major theme. A greater emphasis on convenience for the diet was identified as choosing the cheapest food, choosing food with the least effort, eating fast food, and choosing unhealthy foods because of their longer shelf life. A lower emphasis on convenient eating meant that participants bought more expensive healthy food, cooking instead of eating out, and planning out meals. For example one participant from the sophomore class group stated,

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*“I always want to go to the grocery store and get nutritious stuff. I had that desire and motivation to eat better. But that required going to the grocery store and then finding time to cook the food. Are you going to do that for breakfast, lunch, and dinner?”*

All three dominant emergent themes are also interrelated. The more the participants knew about nutrition, the greater their diet was in their priorities. And vice versa- the greater nutrition was placed among their priorities, the more they learned about nutrition, so their nutrition knowledge increased. The less nutrition was placed among the participants' priorities, the more convenient their food choices seemed to be. The more convenient the participants made their food choices, the lower the priority placed on diet. The greater emphasis the participants' placed on convenience eating, the less the participants learned about nutrition (this is because leaning about nutrition takes time and effort and is not convenient). However, the more the participants knew about nutrition, the lower the emphasis placed on convenience eating. So the participants that seemed to eat a healthy diet knew correct nutrition knowledge which caused them to place their diet in a high priority, deliberately tried to learn about nutrition information, and decreased their emphasis on convenience food choices. A student that did not practice healthy food choices did not know correct or any nutrition information, therefore placing a nutrition lower on a list of priorities, and increasing the emphasis on convenience food choices.

### Individual Group Information

The six focus groups were analyzed together and the research team did not identify a variation between the dominant emergent themes. Groups one and two were conducted in the summer and comprised of all seniors with one recent graduate. Most discussed their current

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diets as influenced by having more independence from all the participants. These two first groups were the oldest in age, so they had been separated from their families for the longest amount of time. This caused them have a greater amount of independence and responsibilities, which heavily influenced their diets. The preliminary data was analyzed which prompted additional data collection during the fall of 2015. The last four focus groups were conducted during the school year (August and September of 2015) and were separated by class. There was a freshman, sophomore, and junior year focus group. The sixth group was the nutrition majors focus group. Questions to explore differences for each of the focus groups were added to the interview guide. Questions for the freshman group prompted heavy comparison between diets at home versus diets in college. The freshman group most recently made the transition from living with their parents, so they were best able to describe the transition to completely relying on the dining hall for intake. The sophomore group was asked more to reflect on how they have coped with challenges that arose freshman year since they had already lived on campus for one year. The junior class group was prompted to speak about the transition from living in the dormitories to moving to an apartment and how that affected their food habits. The nutrition major group was asked all of the same questions, but the research team note major differences from their answers compared the rest of the participants' answers. The nutrition major group did describe better coping mechanisms and addressed being motivated to eat healthy because of long term health implications, but they still identified the same barriers to a healthy diet as the other groups. Overall, there were no significant differences for overarching themes between the responses from each group. The minor differences provided deeper understanding for how the food choice model applies to all of the participants.

### **Survey**

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### Survey Characteristics

The sample consisted of 288 participants. This sample contained 100% women. No other demographic information was recorded.

### Nutrition Knowledge Responses

<i>What percentage of your intake should be fats?</i>		
Answer	Response	%
0%	0	0%
2-10%	233	78%
20-30%	65	22%
30-50%	1	0%

<i>What is the suggested calorie intake for women?</i>		
Answer	Response	%
1000	21	7%
2000	247	83%
3000	13	4%
I don't know	18	6%

<i>Which amount of vegetables should you eat in a day?</i>		
Answer	Response	%
1 cup	12	4%
2 cups	105	35%
2 1/2 cups	160	54%
I don't know	22	7%

<i>Which amount of fruit should you eat in a day?</i>		
Answer	Response	%
1/2 cup	14	5%
1 cup	101	34%
2 cups	165	55%
I don't know	19	6%

<i>What percentage of your intake should be carbohydrates?</i>		
Answer	Response	%
0%-10%	16	5%
10-30%	182	61%
50-60%	98	33%
70-90%	3	1%

*Figure 3: Percentage tables for the knowledge answers from the survey*

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61% of participants answered that carbohydrates should comprise of 10-30% of the diet and only 33% answered the question correctly (50-60% of the diet). 53% of the participants answered that protein should comprise of 35-50% of the diet while only 35% answered this question correctly (10-35% of the diet). When asked to provide examples of protein, approximately 47% included meat products (including, meat, chicken, steak, beef, pork, turkey, etc). 21% listed plant-based protein, 16% list nuts, 13% list eggs and dairy, and 3% list incorrect answers. Examples of incorrect protein source responses were rice, vegetables, and granola bars. When asked what percentage of the diet should be fat, 78% chose the correct answer as 2-10%. 22% chose the incorrect answer of 20-30%. 54% of respondents answered correctly (2.5 cups) as to which amount of vegetables should be eaten daily. 35% chose 2 cups and 7% responded that they did not know. When asked which amount is the correct daily intake of fruit, 55% answered correctly (2 cups), 34% responded as one cup, and 6% chose that they did not know. 83% of respondents answered that the total energy intake for women should be 2000 kilocalories with only 6% saying they did not know. When asked about their source for nutrition information, 26% answered with non-credible internet and media sources. The next highest scores were 16% for both packaging/labeling and credible nutrition sources (college classes and dietitians)

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### Nutrition Beliefs and Attitudes

Statistic	I purposefully incorporate fat into my diet.	I purposefully incorporate carbohydrates into my diet.	I would be willing to try new foods in the dining hall if I knew the health benefits.	I want to improve my diet to represent a more healthy diet.	I would be willing to go to a health class on campus outside of normal class time
Min value	1	1	1	1	1
Max value	5	5	5	5	5
Mean	2.61	3.17	3.71	4.33	3.24
Standard Deviation	0.91	1.05	0.84	0.66	1.11

Statistic	I feel my diet represents a healthy diet.	I mostly eat foods that can be made quickly.	I feel that when I am stressed I eat unhealthier.	I feel like BDH mainly serves unhealthy foods.	I don't have enough money to eat healthy.	I feel that I eat unhealthier when I am with my friends.	I am confused by nutrition information.	I purposefully incorporate protein into my diet.
Min Value	1	1	1	1	1	1	1	1
Max Value	5	5	5	5	5	5	5	5
Mean	3.06	3.48	3.88	3.27	3.07	3.43	2.52	3.60
Standard Deviation	0.89	0.94	1.06	0.98	1.14	1.13	1.04	0.96

*Figure 4: Raw Statistics of Likert-Scale Questions from Online Survey*

Each of these questions asked the participants to agree with the given statement on a scale from 1 to 5. 1 represented strongly disagreeing, 2 represented disagreeing, 3 represented a neutral response, 4 represented agreeing, and 5 represented strongly agreeing. Most of the

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likert-scale responses were neutral, but some did provide strong answers. “Wanting to improve my diet” is the strongest answer with a 4.33 average, meaning that the participants strongly agreed that they wanted to change their diets. Another compelling statistic was that there was an average response of 3.88 for identifying with “eating a more unhealthy diet when stressed.” There was only an average of 2.61 for “purposefully incorporating fat into the diet” and only an average of 2.52 for “feeling confused by nutrition information.”

The highest standard deviations were for not having enough money to eat healthy(1.14) and feeling like I eat more unhealthy when I am with my friends (1.13).The lowest standard deviation with was pertaining to wanting to improve my diet (.66).

The final question asked was “What can Meredith College do to help you have a more healthy diet?” A huge majority (189) of the responses related to improving the on campus dining and vending machines’ food quality, hours, and prices. The second most significant response was for more informal nutrition education through the use of seminars, flyers, and healthy dining hall example meals.

### **Discussion**

All of the current research about college students addresses the factors that contribute to weight gain or a general unhealthy diet. This research explores why students choose to pick these unhealthy habits. The focus groups and the survey results suggest some of the reasons why this happens. The focus group discussions provided very specific instances that affected students' food choices. Because each focus group was separated by class and one contain only nutrition major students, information about factors that affect each class were revealed. It can be suggested that nutrition majors maintain a more healthy diet, while still dealing with all the barriers identified by all the other participants.

### **Confusion**

The results suggest that confusion about nutrition leads to unhealthy dietary habits. Nutrition knowledge is the center of the conceptual model because it so drastically affects the other important aspects of the model. When nutrition knowledge was increased in the participants (exemplified in the nutrition majors group) their priority for a better diet increased and their emphasis on unhealthy food decreased. The huge transition to independence that was identified in almost every participant did seem to have a huge effect on their food choice in college. However, the underlying cause of the unhealthy food habits was that they did not accumulate any nutrition knowledge during development. So when they began college, they did not know how important nutrition was or how to make informed healthy food choices. This conclusion arises from the fact that the nutrition major focus group still dealt with all the barriers from cost to scheduling, but they knew that nutrition should be a priority so they made efforts to still maintain a healthy diet. The nutrition major group also identified that they were completely dependent on their parents for their intake before the transition, and some even

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identified that they did not have a healthy diet before college. Fortunately, they learned the importance of good nutrition through their classes, so they strived to make their diets healthier.

### **Suggestions from the Nutrition Major's Focus Group Discussion**

A key aspect of the nutrition major focus group's discussion was that they discussed the same barriers that the other participants identified when trying to maintain a healthy diet. They said that having hectic schedules, part time jobs, less money, and more time spent on school work negatively affected their diets. The difference with this group is that they were able to list ways that they use their knowledge about nutrition to combat these barriers. For example, one student said that stress caused her not to be hungry and that it actually caused her to lose a lot of unnecessary weight. She said that now she makes sure she makes more time to eat, even if she is studying, because she realizes that her body needs that nourishment even if the stress is causing her to not be hungry. Other participants who identified this problem did not mention they knew that it was important to eat, or that they realized that they should also stop to eat.

### **Disordered Eating**

Like this participant, many other participants mentioned disordered eating characteristics. Participants were more likely to discuss disordered under-eating compared to disordered over-eating. This may be because they do not realize what dis-ordered undereating is, or that they do not think that it a concern. Media emphasizes that being overweight is very unhealthy<sup>4</sup>, but does not seem to focus on mal-nourishment or underweight as also being a problem. This could cause students to not realize the implications of malnutrition if they are at normal weight. This significantly ties into the conceptual model from this research. For example, if a student at Meredith College is not competent in nutrition knowledge, she could increase consumption of convenience foods. This could mean, in terms of disordered eating, that she will

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often skip meals because they may be too expensive or too time consuming. Some participants did say that if they will skip breakfast if they want to sleep in (because Meredith College's dining hall is only open from breakfast from 7am-9am). Another aspect of the food choice model is priority. If the disordered-eating student does not make nutrition a high priority she may skip meals to do other things like study or socialize.

One research team identified the frequency of risky eating behavior for college females.<sup>2</sup>Females in the study displayed a risky behavior for how they viewed body weight. 45% always worried about weight gain in the past month, 37.5% always worried about calorie consumption, and 35% always compared their bodies to celebrities or models. These findings are similar to the participants' discussions during the focus groups in the current study.

For instance, many of the students seemed to measure health or diet status in terms of body size. Some of the participants said that when they see other students that look fit or skinny, they are more motivated to eat healthy or exercise. They also said that when they feel more "fluffy" they are then internally motivated to eat a more healthful diet. This could suggest that participants' motivation to eat healthier is to look thin. This is a major characteristic of disordered eating that needs to be corrected. Health status should be determined in the amount of nutrients in the body<sup>1</sup>. If young adults continue to measure nutrition status in terms of body weight or body size, they may only choose foods in terms of energy amount or if it will cause them to gain weight. They may ignore other major health benefits of foods such as vitamin or mineral content.

### **Perception of Food**

The topic of disordered eating also arises in the survey results when students underestimated the amount of carbohydrates needed in the diet. For so long, media has

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advertised low-carbohydrate diets, foods, and lifestyles because of weight gain. This may cause the public to only perceive carbohydrates as a negative part of the diet that could result weight gain. They don't perceive carbs as dominating the diet in order to give quick energy for the brain and body. The nutrition majors' group did not seem to mention body image to be a motivator for health. They stated motivations such as physically feeling better, readying their bodies for childbirth, and disease prevention. One study conducted by Cloutier et al<sup>32</sup> explored the differences in perceptions between dietitians (nutrition professionals) and the Canadian public. They found that the public viewed fruits and vegetables as healthy, but not grains. Dietitians viewed both as healthy. This is congruent with my survey findings considering that the participants answered the questions about serving sizes of fruits and vegetables correctly, but not about the percentage of carbohydrates that should be in the diet. This could suggest that my participants may not view carbohydrates as healthy like the participants that did not view grains as healthy in the previously mentioned study. This is interesting considering that fruits, vegetables, and grains are all major sources of carbohydrates. These results may also suggest that the participants do not know which foods contain carbohydrates.

Another research study<sup>29</sup> suggests that the public has misconceptions about the role of fat in the diet. After a continent-wide survey asking grocery shoppers their perceptions on a healthy diet, they found the major confusion was about fat. Shoppers decreased their consumption of visible fat (margarine and mayonnaise) but were increasing their intakes of heavy fatty foods such as cheese, chocolate, bacon, and pastries. However, fat was at the top of the customer's concerns. They suggested a factor contributing to this confusion is level of understanding for the different types of fats. The participants identified that they should avoid trans fats but did not know which fats to include. They found that 64% of the customers felt that the information about fat was contradictory. If the public does not understand the role and the

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difference in the fats, then they probably will feel that the information is very contradictory. In my survey the participants did accurately answer the necessary amount of fat in the diet, but the survey did not test the knowledge about the different types of fats. This is an area for future study. However, one of my participants in the focus group did admit to being confused by nutrition information about carbohydrates. She explained that she learned that she should increase her intake of carbs when exercising, but she also learned that eating carbohydrates could lead to weight gain. This suggests that Meredith College students could also be struggling from the same feeling of contradictory information as the participants from the European study<sup>29</sup>. Meredith College students could be avoiding potentially healthy foods in fear of weight gain, or be completely confused by nutrition information in general.

One possible solution to this problem is proposed by a European research team.<sup>4</sup> After reviewing research pertaining to adolescents, they identified that a pro-eating culture needs to be encouraged instead the seemingly present “anti-eating” culture. This could mean promoting the increase of whole grains and healthy fats instead of encouraging the public to avoid fats and carbs to help with weight loss. Ultimately, this could decrease the amount of disordered eating or eating disorders overall. By promoting a mind-set of increasing consumption of healthy foods for a healthy life, students may remove the emphasis on body size and weight loss and instead aim to increase for a more healthy lifestyle overall.

### **Differences between Classes**

Another major observation from this study is the affect that the time at Meredith College had on the food choices. The freshman class group did not seem to be as worried about their diets as the older groups. Future research needs to be conducted to find out why. This could be because they have not gained weight yet, or they are still adjusting to so many other

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aspects of the college life. Everything is still new and exciting and they have not been able to think about aspects of life as far as their diets. They also seemed to have a very low level of nutrition knowledge because they stated that a healthy diet consists of vitamins, water, and taking naps. One of the participants said that she did not care about her diet, because she felt that this did not affect her life right now. She did say that she was getting sick so she should probably try to improve her diet. Her statement show two major point of significance: 1) freshman may not realize how their diet affects them 2) avoiding illness may be a motivator for college students to eat healthy. One study found that during the first 3-4 months of college, student gain about 1.3-6.8 pounds.<sup>5</sup> This could suggest that if freshman do not seem to care about their nutrition, the effects are not evident until the second semester of college. This could be why the sophomore focus group in my study cared more about their nutrition. There are no major differences to note in the sophomore discussion group, except that they seemed to start to be a little more aware of their diets. However, they still did not seem to be as concerned as the upperclassmen groups. The participants of the sophomore group were still relying on the dining hall for all of their food, and some mentioned going off campus to eat because they did not want to eat in the dining hall anymore.

### **Dining Hall Preference in Relation to Procedural Nutrition Knowledge**

The underclassman's dependency on the dining hall was a huge topic of discussion among all the groups and important factors for consideration arose. The participants mainly identified that the dining hall as very unhealthy with very limited sources of healthy food. Many believed that the only source of healthy food was the salads. Meredith College does serve other healthy options such as vegetarian dishes , many types of cooked vegetables, and fish options.<sup>12</sup> The nutrition major focus group did not seem to degrade the dining hall as much and even

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praised it for offering a variety of vegetables compared to at home. One student said that it helped increase her intake of vegetables because of the greater prepared availability. This relates back to the confusion aspect of the food choice model in helping to decide food choice. The nutrition majors know more about nutrition, so they know that the dining hall does have more healthy options besides salad. This could relate to misconceptions about healthy food.

One study<sup>30</sup> suggests that people judge the health content of food by their description more than their actual nutritional content. They found that participants were more likely to classify pie as unhealthy compared to oatmeal even though the nutrition information provided showed that the pie was actually healthier than the oatmeal considering calorie, vitamin, and macronutrient content. This could suggest that people don't know how to use nutrition information correctly to make healthy food choices. And for Meredith College students this could mean that they do not know how to use the nutrition information to make or identify healthy food options in the dining hall. Another study<sup>7</sup> suggests that the public knows adequate information about nutrition, but they do not know how to use this information to make healthy food choices. They called this "procedural nutrition knowledge." Many of the other studies that tried to test public's nutrition aptitude did not find many significant results; however, overweight, obesity, and eating disorders are still prevalent. So the problem must be a different aspect than just declarative nutrition knowledge. This is supported by the results from the current survey and focus groups. The survey results did not identify many instances of significant lacking nutrition knowledge, but focus groups' discussions still indicated unhealthy diets for Meredith College students. The Swiss study identified that their participants thought that eating healthy meant eating less or reducing portion size, but did not mention changing the proportion of the types of food in their diets. They also struggled with defining a healthy diet. My focus groups also struggled with defining a healthy diet. The Swiss study's findings suggested that the

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gap between a high nutrition knowledge and an unhealthy lifestyle is the knowledge in how to use the nutrition information to make an informed choice. This could explain why the survey did not show that there was a huge nutrition knowledge deficit, but that the participants still admitted to bad diet habits. For the attitude and belief questions from the survey, they also did not strongly admit to purposefully incorporating fats, protein, or carbohydrates into their diets. They disagreed that they were confused by nutrition knowledge.

Meredith college students may be competent in declarative nutrition knowledge but do not know how to use that information to make healthy choices in situations like the dining hall. This may be why they identified that salad is the only healthy option in the dining hall. They do not know how to alter or create healthier food options in the dining hall. They also could not know how to analyze the provided nutrition information to choose the healthiest option. If they knew more about how nutrition plays a role in food choice, they could realize that the dining hall does have more healthy options. In order to affect the food choice model in a positive way for dining hall food choice, knowledge about how to determine healthy dining hall options would need to increase. Emphasis on convenience would have to be decreased, meaning that students may need to ask the cooks to steam their vegetables instead of sauteeing them which could cost them extra time. There would also have to be a greater priority placed on nutrition which could mean that they would have to take the time to look at the nutrition facts for the foods or sacrifice their taste in order to eat a healthier option.

### **Dining Hall Preference in Relation to Food Preference**

The students often said that when the dining hall prepared healthy foods, they were greasy and made them feel sick. Some mentioned that some of the vegetable options they offered contained spices that they did not prefer. Sometimes the dining hall's healthy options

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are ethnic.<sup>12</sup> Participants from the focus groups discussed how they did not like the ethnic food at the dining hall. The European study<sup>4</sup> suggested that food preference for adolescents often arises from their innate food preferences formed by familiarity. In context of this study, this could mean that students were too used to the way their parents prepared the food to enjoy the taste of different healthy options. In the survey, the students were asked if they would be willing to try new foods in the dining hall if they knew that they were healthy. The survey result was a mean of 3.7 meaning they were in the middle of neutral and agreeing (not extremely agreeing). Again, the expected results were that student would say that they would be extremely willing to want to be healthy by trying the options they already have available for them in the dining hall. However, this was not a very strong response which could suggest that knowledge about the importance of a healthy diet should be increased. According to the food choice model for Meredith College students, if this happens students would be will to compromise taste for nutrition.

### **Upperclassmen's Shift in the Model because of Increased Independence**

The junior group differed because most of the participants were now living away from the dorms. They discussed being more involved in school work and classes, which contributed to a very unhealthy diet. Major differences were found in the senior class focus groups. Because they had been away from relying on the dining hall for at least a year, they identified different factors for their food choices. They said things like not being able to store healthy foods, eating better now that they can prepare their own foods, and money being a bigger factor than previously. This could be because now they have to buy their own foods instead of the dining hall providing it. Another interesting piece of information that arose in this group is that many of them identified that their families had a huge effect on them, because they pressured them to

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eat what the family eats. A couple of the participants said that they wanted to eat healthier, but it was hard because their families did not eat healthy. This is important to discuss, because it relates to the amount of time that seniors have been separated from their families. After being separated for 3 years, they now have formed more of their own patterns and preferences. They can change how they used to eat because they choose and prepare their own food.

Underclassman did not mention this. This may be because they have not been separated by these providers as much to analyze their own dietary choices.

This could suggest that it is not until junior year that students start analyzing their own food choices and start correcting the “model” for themselves. A couple of the participants for these senior groups did say that they have improved their diet since their beginning years at college. They identified that preparing their own food has helped them to eat healthier. They could now choose what they wanted at the grocery store, chose how to prepare it, and forced them to plan more instead of being able to rely for food from the dining hall. In relation to the food choice model for Meredith college students, there is a greater transition to independence for juniors, because this is when Meredith College students are allowed to move off campus, thus not buying the dining hall meal plan any more. This provides for so many more aspects that are involved in food choice. An even greater emphasis must be placed on intake when students are not reliant on the dining hall. They are no longer able to eat in the dining hall at their leisure to choose from already prepared food. The upperclassmen must now buy and prepare their own food. If they do not do this, they will not even be able to have food to eat at all. Convenience eating played a much bigger role in these upperclassman’s food choices. They could not eat pre-prepared food, so they discussed eating out often or buying food that is very easy to prepare. When the topic of a healthy diet was discussed, priority of nutrition seemed to low. The participants discussed not making time to go to the grocery store instead of eating at a

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restaurant. They also chose to spend their allotted money on items such as alcohol or clothing instead of healthy food. More upperclassmen students identified as having jobs and receiving less money from their parents than they did as underclassmen, so they had to budget their money more than they used to, choosing many cheaper options. With new part time jobs and more classwork, the upperclassmen students placed a huge emphasis on convenience eating. They mentioned eating fast food for dinner in order to quickly get back to working on homework. They also discussed that healthy food expired quicker because of the absence of added preservatives. They said that if they bought more expensive healthy food, then they would end up throwing it away before they ate it all and wasted money. So they talked about how it was more convenient to buy the cheaper more unhealthy food, because it could be stored longer.

In order to improve diets for the upperclassman, it will be important to address these issues. Some of the students did identify that in order to improve their diets they would have to spend more money on healthy food and spend more time planning and preparing their own healthy options. However, they knew this was the solution, but did not act on it. According to the model, this would be because of a deficiency in knowledge. When nutrition knowledge is low, the other two factors are negatively affected. The upper class would be able to identify that they have a low priority of nutrition and a greater emphasis placed on food. If information about diet related to disease, illness, performance, and eventual costs were increased, the emphasis on convenience may decrease and the level of priority may increase.

It is important to note that the survey did not further explore the idea that food choice can change depending on the amount of time spend away from home, so it cannot be completely suggested that this research suggests that this happens. However, it would be an

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area for further research. If factors could be identified specific to each class at Meredith College, more effective education could improve diets.

### **Recommendations and Implications for Theory, Research, and Practice**

The limitations of this study allow for opportunities of further research. Meredith College is a small women's college in the south which means that the results cannot be generalized to other populations. This study should be repeated in co-ed colleges in other regions of the United States at college with varying characteristics. The inclusion of men could cause a change of in the results based on other literature review. Future study could also include more procedural nutrition knowledge on the survey or more questions about the role of the different types of fats. These implications have been researched among adults, but not for college students.

One study identified that self- efficacy, self-confidence and self-esteem are all common factors for those students who have healthier eating habits.<sup>34</sup> Future research could explore this topic more investigating what strategies healthy college students use to maintain a healthy diet. This study begins to investigate this by asking nutrition majors about their transition to college in relation to their diet. However, not enough results were produced to create implications. By learning how more healthful students cope with stress, eat healthier on a budget, and make time for a healthy life, other unhealthy students could benefit by adapting these strategies.

Based on results, implementing the food choice model for Meredith College students may improve student dietary habits. First, nutrition knowledge would need to be increased. Meredith College students need to be educated on how to use the nutrition information they already know to make healthy choices. They also need to be educated about how to eat healthy with less money, how to avoid stressful-dietary habits, and the implications of an unhealthy diet

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later in life. Increased awareness about nutritious foods in the dining hall should be of major concern because of the great amount of discussion about it. Every focus group discussed how the dining hall was a barrier to eating healthy. Meredith College undergraduate students heavily rely on the dining hall for their intake, so it is important for them to know how to make healthy choices in the dining hall. According to the model, improving one major theme will also help to improve the other themes. This strategy could be implemented for Meredith College nutrition education.

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## References

1. U.S. Department of Agriculture and U.S. Department of Health and Human Services. Dietary Guidelines for Americans, 2010. 7th Edition, Washington, DC: U.S. Government Printing Office, December 2010.
2. Nelson MC, Story M, Larson NI, Neumark-Sztainer D and Lytle LA. Emerging adulthood and college-aged youth: An overlooked age for weight-related behavior change. *Obesity*. 2008; 16: 2205–2211. doi: **10.1038/oby.2008.365**
3. Health Topics: Obesity. World Health Organization Web site. <http://www.who.int/topics/obesity/en/> Updated January 2015. Accessed November 30, 2015
4. Moreno LA, Gonza'lez-Gross M, Kersting M et al. Assessing, understanding and modifying nutritional status, eating habits and physical activity in European adolescents: The HELENA (Healthy Lifestyle in Europe by Nutrition in Adolescence) Study. *Public Health Nutrition*. 2007; 11 (3): 288-299. dio: **10.1017/S1368980007000535**
5. Levitsky DA, Halbmaier CA, and Mrdjenovic G et al. The freshman weight gain: a model for the study of the epidemic of obesity. *International Journal of Obesity*. 2004; 28: 1435–1442. dio: **10.1038/sj.ijo.0802776**
6. Nelson MC, Larson NI, Barr-Anderson D, Neumark-Sztainer D, et al. Disparities in dietary intake, meal patterning, and home food environments among young adult nonstudents and 2- and 4-year college students. *American Journal of Public Health*. 2009; 99 (7): 1216-1219. doi: **10. 2105/AJPH.2007.147454**
7. Racette SB, Deusinger SS, Strube MJ, et al. Changes in weight and health behaviors from freshman through senior year of college. *Journal of Nutrition Education*. 2008; 40: 39-42. doi: **10.1016/j.jneb.2007.01.001**
8. Lenz B. The Transition From Adolescence to Young Adulthood: A Theoretical Perspective. *The Journal of the School of Nursing*. 2001; 17 (6): 300-306.
9. Trochim WMK. Qualitative Approaches. <http://www.socialresearchmethods.net/kb/qualapp.php> Published 2006. Updated October 20, 2006. Accessed November 30, 2015.
10. Breckenridge JP, Jones D, Elliott I, and Nicol M. Choosing a methodological path: Reflections on the Constructivist Turn. *Grounded Theory Review*. 2012; 1 (11)
11. About Meredith College/ Quick Facts. Meredith College Website. [http://www.meredith.edu/about\\_meredith/quick\\_facts](http://www.meredith.edu/about_meredith/quick_facts). Accessed November 30, 2015
12. Dining Services- Home. Meredith College Website. [http://www.meredith.edu/on\\_campus\\_services/dining\\_services](http://www.meredith.edu/on_campus_services/dining_services). Accessed November 30, 2015.
13. Meredith College- Student Life- Summary. US News and World Report. <http://colleges.usnews.rankingsandreviews.com/best-colleges/meredith-college-2945/student-life>. Updated 2015. Accessed November.

## Surveying the Food Climate of Meredith College: A Qualitative Study

14. Oaks ME, and Slotterback CS. The good, the bad, and the ugly: Characteristics used by young, middle-aged, and older men and women, dieters and non-dieters to judge healthfulness of foods. *Appetite*. 2002; 38: 91-97
15. Mayo Clinic Staff. Diseases and Conditions- Heart Disease. Mayo Clinic Website. <http://www.mayoclinic.org/diseases-conditions/heart-disease/basics/definition/con-20034056>. Published 1998. Updated 2015. Accessed November 30, 2015.
16. Diabetes. U.S. National Library of Medicine. <https://www.nlm.nih.gov/medlineplus/diabetes.html>. Updated November 27, 2015. Accessed November 30, 2015.
17. Mayo Clinic Staff. Diseases and Conditions- High Blood Pressure (hypertension). Mayo Clinic Website. <http://www.mayoclinic.org/diseases-conditions/high-blood-pressure/basics/definition/con-20019580>. Published 1998. Updated 2015. Accessed November 30, 2015.
18. Mayo Clinic Staff. Diseases and Condition- Osteoporosis. Mayo Clinic Website. <http://www.mayoclinic.org/diseases-conditions/osteoporosis/basics/causes/con-20019924>. Published 1998. Updated 2015. Accessed November 30, 2015.
19. Anderson M. What is disordered eating? Academy of Nutrition and Dietetics Website. <http://www.eatright.org/resource/health/diseases-and-conditions/eating-disorders/what-is-disordered-eating>. Published February 25, 2015. Accessed November 30, 2015.
20. Eating Disorders Victoria website. What is an Eating Disorder? <http://www.eatingdisorders.org.au/eating-disorders/disordered-eating-a-dieting>. Revised April 20, 2015. Accessed November 30, 2015.
21. Eating Disorders: About more than food. National Institute of Mental Health. <http://www.nimh.nih.gov/health/topics/eating-disorders/index.shtml>. Accessed November 30, 2015.
22. Marcason W. Orthorexia: An obsession with eating pure. Academy of Nutrition and Dietetics Website. <http://www.eatright.org/resource/health/diseases-and-conditions/eating-disorders/orthorexia-an-obsession-with-eating-pure>. Published June 1, 2015. Accessed November 30, 2015.
23. Diet and Physical Activity: What's the Cancer Connection? American Cancer Society Website. <http://www.cancer.org/cancer/cancercauses/dietandphysicalactivity/diet-and-physical-activity>. Revised February 5, 2015. Accessed November 30, 2015.
24. Skiba LM. Assessment of Disordered Eating Behaviors in College-aged Female Health and Human Services Majors. (Doctoral dissertation, Kent State University). 2012. Chicago
25. National Associated of Anorexia Nervosa and Related Disorders. Eating Disorder Statistics. <http://www.anad.org/get-information/about-eating-disorders/eating-disorders-statistics/>. Updated 2015. Accessed November 30, 2015.
26. Cloutier K, Mongeau L, Pageau M, Provencher V. Food Perceptions among Adults and Registered Dietitians: Are They Similar? *Food and Nutrition Sciences*. 2013; 4: 2-8. doi: **10.4236/fns.2013.410A002**

Surveying the Food Climate of Meredith College: A Qualitative Study

27. Oakes ME and Slotterback CS. What's in a name? A comparison of men's and women's judgements about food names and their nutrient contents. *Appetite*. 2001; 36 (10): 29-40.
28. Margetts BM, Martinez JA, Saba A, Holm L, Kearney M, and Moles A. Definitions of Healthy Eating: a pan-EU survey of consumer attitudes to food, nutrition and health. *European Journal and Clinical Nutrition*. 1997; 51 (S2): S23-29.
29. Connie Diekman C, Malcolm K. Consumer Perception and Insights of Fats and Fatty Acids: Knowledge on the Quality of Diet Fat. *Annals of Nutrition and Metabolism*. 2009; 54 (S1): 25-32. **doi: 10.1159/000220824**
30. Oakes ME and Slotterback CS. Prejudgments about eating a healthy breakfast. *Current Psychology*. 2005; 23 (4): 267- 278.
31. Dickson-Spillmann M and Siegrist M. Consumers' knowledge of healthy diets and its correlation with dietary behavior. *Journal of Human Nutrition Diet*. 2011; 24 (1): 54-60. **doi: 10.1111/j.1365-277X.2010.01124.x**
32. Carels RA, Konrad K, and Harper J. Individual differences in food perceptions and calorie estimation: An examination of dieting status, weight, and gender. *Appetite*. 2007; 49: 450- 458
33. Oakes ME and Slotterback CS. Judgements of food healthfulness: food name stereotypes in adults over age 25. *Appetite*. 2001; 37: 1-8. **doi: 10.1006/appe.2001.0405**
34. Crombie AP, Ilich JZ, Dutton GR, Panton LB, and Abood DA. The freshman weight gain phenomenon revisited. *Nutrition Reviews*. 67 (2): 83-94. **doi: 10.1111/j.1753-4887.2008.00143.x**
35. Quick VM and Byrd-Bredbenner C. Disturbed eating behaviours and associated psychographic characteristics of college students. *Journal Human Nutrition Diet*. 2013; 26 (S1): 53-63
36. Cullen KW, Koehly LM, Anderson C, Baranowski T, Prokhorov A, Basen-Engquist K, et al. Gender Differences in Chronic Disease Risk Behaviors Through the Transition out of High School. *American Journal of Preventative Medicine*. 1999; 17 (1): 1-7.
37. Healthy Campus 2020. American College Healthy Association. <https://www.acha.org/healthycampus>. Updated 2015. Accessed November 30, 2015.
38. Levitsky DA, Halbmaier CA, and Mrdjenovic G. The freshman weight gain: a model for the study of the epidemic of obesity. *International Journal Obesity Related Metabolic Disorders*. 2004; 28 (11): 1435- 1442.
39. Roy R, Kelly B, Rangan A, and Allman-Farinelli M. Food Environment Interventions to Improve the Dietary Behavior of Young Adults in Tertiary Education Settings: A Systematic Literature Review. *Journal of the Academy of Nutrition Dietetics*. 2015; 115 (10): 1647- 1681.

## Appendices

## Appendix A: Interview Guide

**I** OPENING

*Hello ladies! I know we've been emailing, but I want to take a chance to introduce myself. My name is Illa Jones and I'm a junior here.*

*I am interested in hearing your opinions and insights about how the Meredith College lifestyle affects your food intake, so please feel free to tell me stories and give me a lot of examples. When you tell stories, please do not refer to the people in your stories by their real names. You can make up a name for each person or refer to them by their relationship to you (like your friend or your roommate).*

*Remember, this is all about what you think and about your perceptions. It is okay if you are unsure or do not know the answer to some questions. We are interested in your interpretation of the question and your perspective on the topic. Again, I'll be taking notes throughout the discussion, so I may pause from time to time to finish writing.*

*I'd like to tell you a little bit about this rules of this discussion. I hope you were all able to look over the consent form in the email I send. Make sure to sign it the consent form and fill out the demographic information before we get started.*

*Just a reminder that the consent form states that all personal information from this discussion will remain confidential. This also means that you all should not share personal information about others in this group outside of this room. If you choose not to sign the consent form you will not be able to be in this discussion, because I must have consent from all participants.*

*Some guidelines for the discussions will be*

- *No need for hand raising. This is open discussion.*
- *Please don't have side conversations but instead bring them to the larger group. I want to hear as many of your thoughts as possible*
- *Please be respectful of other's responses by not talk over others or any side remarks.*
- *There are no right or wrong answers- only opinions, experiences and ideas that are all valuable*

## **II** DEMOGRAPHIC INFO:

You've told me a bit about yourself in our email conversation, but I'd like to have it on the audio recorder, so I'm going to ask you a few questions again. Please remember that you do not have to answer any questions that you do not wish to answer.

1. What is your major?
2. What is your age?

[If the student is under 18 years of age: I'm sorry. There must have been a misunderstanding. We are only allowed to speak with people 18 years of age and older.]

3. What is your gender?  Female  Male
4. Where are you from?
5. What is your race/ethnicity?

# III

## Discussion Questions

### 1

**Prior Habits:** To start, let's talk about how you would describe your food intake when you were in high school.

Describe your typical diet before coming to college?

	REQUIRED PROBES (if not already addressed)		GENERAL PROBES
	Eating at home vs. Eating out?		<i>Can you explain more about this?</i>
	Who cooked? Planned meals?		<i>Can you give an example?</i>
	Variety?		<i>Can you think of anything else?</i>
	What affected your food intake back then?		

	REVIEW PROBES
	<i>Did I get that right?</i>
	<i>Did I leave anything out?</i>
	<i>Do you have anything else to add?</i>

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## 2

**Transitions:** Now let's talk about how your food intake changed after coming to Meredith College.

What dietary changes have taken place throughout your time in college?

	REQUIRED PROBES (if not already addressed)		GENERAL PROBES
	Fruits and vegetables?		<i>Can you explain more about this?</i>
	Variety?		<i>Can you give an example?</i>
	Dining Hall?		<i>Can you think of anything else?</i>
	Eating out?		
	Snacking?		

	REVIEW PROBES
	<i>Did I get that right?</i>
	<i>Did I leave anything out?</i>
	<i>Do you have anything else to add?</i>

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## 3

**Lifestyle Affects:** Now let's talk about how lifestyle impacts what and how you eat.

How does college lifestyle affect your eating habits?

	REQUIRED PROBES (if not already addressed)		GENERAL PROBES
	How does weight affect your food intake?		<i>Can you explain more about this?</i>
	How does physical activity affect your diet?		<i>Can you give an example?</i>
	How does alcohol and/or drug intake affected your food intake?		<i>Can you think of anything else?</i>
	How does stress affected your diet?		

	REVIEW PROBES
	<i>Did I get that right?</i>
	<i>Did I leave anything out?</i>
	<i>Do you have anything else to add?</i>

## 4

**Ideal Patterns:** Lastly let's talk about how you would describe a healthy diet.

What does a healthy diet look like to you?

	REQUIRED PROBES (if not already addressed)		GENERAL PROBES
	How do you maintain your health?		<i>Can you explain more about this?</i>
	What barriers do you face to eating healthy?		<i>Can you give an example?</i>
	What makes you want to eat healthy?		<i>Can you think of anything else?</i>

	REVIEW PROBES
	<i>Did I get that right?</i>
	<i>Did I leave anything out?</i>
	<i>Do you have anything else to add?</i>

# IV

## REVIEW

*That was our last question. Now, I'm going to take a few minutes to see if there is anything else you would like to add to each topic including prior habits, transitions, lifestyle affects, and ideal patterns.*

**V****CLOSING:**

The focus group is now over, I would like to thank you for your time and input. I learned lots of things from you today, Thank you! We ask you to not share any of the information we talked about today with others not participating in this focus group. Thank you again for your participation! You have been generous with your knowledge and time! Have a great rest of the day!

## Surveying the Food Climate of Meredith College: A Qualitative Study

### Appendix 2: Focus Groups Consent Form

Meredith College

INFORMED CONSENT FORM for RESEARCH

Title of Research: Surveying the Food Climate of Meredith College: A Qualitative Study

Principle Investigator: Illa Jones

Faculty Mentor: Jennifer D. McMillen, MS

What are some general things you should know about research studies?

You are being asked to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate or to stop participating at any time without penalty. Your choices to participate in this study, or not, will not affect your relationship with Meredith College. The purpose of research studies is to gain a better understanding of a certain topic or issue. You are not guaranteed any personal benefits from being in a study. Research studies also may pose risks to those that participate. In this consent form you will find specific details about the research in which you are being asked to participate. If you do not understand something in this form it is your right to ask the researcher for clarification or more information. A copy of this consent form will be provided to you. If at any time you have questions about your participation, do not hesitate to contact the researcher(s) named above.

What is the purpose of this study?

We hope to gain an understanding of Meredith College undergraduate student's attitudes and beliefs about food intake and nutrition.

What will happen if you take part in the study?

If you agree to participate in this study, you will be participating in a focus group. A moderator will ask several primary discussion questions and additional sub-questions as needed to facilitate the group dialog. You will discuss with the other participants the answers to the questions building on what each other's responses. There will be approximately 10-16 participants in this study; two focus groups ranging from 5-8 participants. Your participation will require 45-60 minutes of your time.

Risks

We will ask you questions about your knowledge and perceptions about food consumption and nutrition. This process may make you uncomfortable by sharing personal experiences, perspectives, and feelings with the other participants and the moderator. Your specific responses will remain confidential and will not be shared nor will anyone be informed of your participation or non-participation in the study. A possible risk would be the sharing of confidential information by the other participants. However, by signing this form, you are agreeing to keep personal stories and information about the other participants confidential. You do not have to answer any questions that you do not wish to answer. If you want to end your participation in the focus group, you can do so at anytime, without penalty. You will need to email Illa Jones (jonesill@email.meredith.edu) to state that you are terminating your participation in the study explaining if any of your responses or information may be used in the analysis. However, a successful focus group require 6-10 participants, so if too many people leave

## Surveying the Food Climate of Meredith College: A Qualitative Study

the discussion, results may be considered invalid. If a participant experiences great distress or anxiety while answering discussion questions, her participation will be terminated from the study without regard to the participant's consent.

### Benefits

You may not receive direct benefits from participating in this project. However, we expect that the project findings will be used to improve campus awareness via nutrition education making Meredith College an overall healthier student body. The analysis from this study will be given to the cafeteria, marketing clubs, health clubs, public health department, and health center in order to improve the health of the students.

### Confidentiality

The information in the study records will be kept confidential. Data will be stored electronically on the Principal Investigator's laptop. The laptop will only be available to the principle investigator. Hard copies of interview transcripts will be kept in locked file cabinets in a lock room in Martin Hall at Meredith College. Within two years after the conclusion of the study, the audio recordings of the interview will be erased and demographic questionnaires will be destroyed. We will talk about what we learned during the interview with other researchers. This could happen in research meetings and/or in written reports. The demographic data will only be used to describe the characteristics of the study participants in oral or written reports. No reference will be made in oral or written reports which could link you to the study.

### Compensation

For fully participating in this study, you will be entered to win one of two \$25 gift certificates to target. If you agree to participate but leave during the discussion, you not be eligible for the drawing.

What if you have questions about this study?

If you have questions at any time about the study or the procedures, you may contact the principle investigator, Illa Jones, at [jonesill@email.meredith.edu](mailto:jonesill@email.meredith.edu) or 336-247-1295.

What if you have questions about your rights as a research participant?

If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Jennifer D. McMillen, MS, research mentor, [mcmillen@meredith.edu](mailto:mcmillen@meredith.edu).

### Consent To Participate

"I have read and understand the above information. I have received a copy of this form. I agree to participate in this study with the understanding that I may choose not to participate or to stop participating at any time without penalty or loss of benefits to which I am otherwise entitled. I understand that I will not share the responses from the group in order to maintain confidentiality of all the participants."

Participant Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Principle Investigator Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## Surveying the Food Climate of Meredith College: A Qualitative Study

### Appendix 4: Consent Form for the Survey

Meredith College

INFORMED CONSENT FORM for RESEARCH

Title of Research: Surveying the Food Climate of Meredith College: A Qualitative Study

Principle Investigator: Illa Jones

Faculty Mentor: Jennifer D. McMillen, MS

What are some general things you should know about research studies?

You are being asked to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate or to stop participating at any time without penalty. Your choices to participate in this study, or not, will not affect your relationship with Meredith College. The purpose of research studies is to gain a better understanding of a certain topic or issue. You are not guaranteed any personal benefits from being in a study. Research studies also may pose risks to those that participate. In this consent form you will find specific details about the research in which you are being asked to participate. If you do not understand something in this form it is your right to ask the researcher for clarification or more information. If at any time you have questions about your participation, do not hesitate to contact the researcher(s) named above.

What is the purpose of this study?

We hope to gain an understanding of Meredith College undergraduate student's attitudes and beliefs about food intake and nutrition.

What will happen if you take part in the study?

If you agree to participate in this study, you will be participating in an on line survey. You will be asked to answer a series of questions about your nutrition knowledge, attitude, and belief. Your participation will require ~10 minutes of your time.

Risks

We will ask you questions about your knowledge and perceptions about food consumption and nutrition. This process may make you feel uncomfortable by asking you to reflect on your attitudes, perspectives, and feelings. Your specific responses will remain confidential and will not be shared nor will anyone be informed of your participation or non-participation in the study. There is always the possibility of tampering from an outside source when using the internet for collecting information. While the confidentiality of your responses will be protected once the data are downloaded from the internet, there is always a possibility of hacking or other security breaches that could threaten the confidentiality of your responses. If you want to end your participation in the survey, you can do so at any time, without penalty.

Benefits

You may not receive direct benefits from participating in this project. However, we expect that the project findings will be used to improve campus awareness via nutrition education making Meredith College an overall healthier student body. The analysis from this study will be given to the cafeteria, marketing clubs, health clubs, public health department, and health center in order to improve the health of the students.

## Surveying the Food Climate of Meredith College: A Qualitative Study

### Confidentiality

The information in the study records will be kept confidential. Data will be stored electronically on the Principal Investigator's laptop. The laptop will only be available to the principle investigator. We will talk about what we learned from the surveys with other researchers. This could happen in research meetings and/or in written reports. The demographic data will only be used to describe the characteristics of the study participants in oral or written reports. No reference will be made in oral or written reports which could link you to the study.

### Compensation

There will be no monetary compensation.

What if you have questions about this study?

If you have questions at any time about the study or the procedures, you may contact the principle investigator, Illa Jones, at [jonesill@email.meredith.edu](mailto:jonesill@email.meredith.edu) or 336-247-1295.

What if you have questions about your rights as a research participant?

If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Jennifer D. McMillen, MS, research mentor, [mcmillen@meredith.edu](mailto:mcmillen@meredith.edu).

### Consent To

Participate \_\_\_\_\_

"I have read and understand the above information. I agree to participate in this study with the understanding that I may choose not to participate or to stop participating at any time without penalty or loss of benefits to which I am otherwise entitled."

**Appendix 5: Online Survey Questions**

Question 1: I have read, understood, and printed a copy of the above consent form and desire of my own free will participate in this study.

Answers: Yes or No

Question 2: I am between 18-22 years old.

Answers: Yes or No

Question 3: What percentage of your intake should be carbs?

Answers: 0-10%; 10-30%; 50-60%; 70-90%

Question 4: What percentage of your intake should be protein?

Answers: 0-10%; 10-20%; 35-50%; 50-70%

Question 5: What are sources of protein? (list some options)

Question 6: What percentage of your intake should be fat?

Answers: 0%; 2-10%; 20-30%; 30-50%

Question 7: Which amount of vegetables should you eat a day?

Answers: 1cup; 2 cups; 2 ½ cups; I don't know

Question 8: Which amount of fruit should you have a day?

Answers: ½ cup; 1 cup; 2 cups; I don't know

Surveying the Food Climate of Meredith College: A Qualitative Study

Question 9: What is the suggested calorie intake for women?

Answers: 1000; 2000; 3000; I don't know

Question 10: Where do you get your nutrition information from?

Question 11: Rate how much you agree with each statement

- I feel my diet represents a healthy diet.
- I mostly eat foods that can be made quickly.
- I feel that when I am stressed I eat healthier.
- I feel like BDH mainly serves unhealthy foods.
- I don't have enough money to eat healthy.
- I feel that I eat healthier when I am with my friends.
- I am confused by nutrition information.
- I mostly eat foods that can be made quickly.
- I purposefully incorporate fat into my diet.
- I purposefully incorporate carbohydrates into my diet.
- I would be willing to try new foods in the dining hall if I knew the health benefits.
- I want to improve my diet to represent a more healthy diet.
- I would be willing to go to a health class on campus outside of normal class time

Answers: Strongly Disagree; Disagree; Neutral; Agree; Strongly Agree

Question 12: What do you think Meredith College can do to help you have a healthier diet?