

2015

Knowledge and Perceptions of Vegetarian Diets Among College-Aged Students

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KNOWLEDGE AND PERCEPTIONS OF VEGETARIAN DIETS AMONG
COLLEGE-AGED STUDENTS

by
Haley Berich

A thesis submitted to the faculty of The University of Mississippi in partial fulfillment of
the requirements of the Sally McDonnell Barksdale Honors College.

Oxford
March 2015

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ABSTRACT

HALEY BERICH: Knowledge and Perceptions of Vegetarian Diets Among College-Aged Students

(Under the direction of Dr. Melinda Valliant)

As health becomes a more primary focus for many Americans, people are turning to new diet choices. Vegetarian diets are available in a wide range of choices and have been found to provide many health benefits. However, adequate knowledge within the general public is lacking when it comes to vegetarian diets. The purpose of this study was to assess the knowledge and perceptions held by college-aged students at the University of Mississippi. A survey was developed and distributed in health and wellness classes that were offered to students of all majors. 187 completed surveys were returned, of which 7 (3.7%) indicated they were vegetarian. The results showed very similar perceptions between the vegetarian and non-vegetarian groups. All perceptions were consistent with the hypothesis except for energy drinks/soda and alcohol consumption or drug use. No statistical significance was found, probably due to the extremely small number of vegetarian respondents in comparison to non-vegetarian respondents. Further research should include larger sample of vegetarians and involve other regions of the United States.

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CHAPTER I: INTRODUCTION

Interest in health and wellness has increased in America over the last several years. The focus of health professionals appears to be shifting from reactionary medicine to preventative medicine. This encompasses the complicated realm of diet, exercise, and making overall healthy decisions that affect one's life for years to come. From this new desire for health information, many unconventional or non-traditional diets have become popular. A lack of knowledge has led to the sale and belief of many unsuccessful dietary patterns. However, one diet that has been suggested to improve health is vegetarianism (Bedford & Barr, 2005).

A vegetarian diet is one that restricts the consumption of animal products. The type of vegetarian diet is determined by what is avoided for consumption, with the most restrictive being a vegan diet. Vegans do not consume any animal products including all meat, fish, dairy, eggs, and honey. Strict vegans will even abstain from purchasing or using leather clothing, furniture, or shoes. A lacto-ovo-vegetarian is one who does not consume any meat or fish, but will eat dairy and eggs. Someone may also be a lacto-vegetarian, restricting the consumption of eggs, or an ovo-vegetarian, restricting the consumption of dairy. The term pescatarian (or pesco-vegetarian) is a relatively new diet category. A pescatarian is a vegetarian who will occasionally eat fish along with eating dairy and eggs. This type of vegetarian does still abstain from consuming other meat products. Some vegetarians, of any type, will also choose to eat certain meats for special

occasions and are referred to as flexitarians. Most outsiders do not consider these individuals vegetarians in this case, however, they may still be self-defined as such.

The type and duration of vegetarianism that a person decides to follow is dependent on their motivation for adopting the diet change. It has been reported that common reasons for motivation are ethical, environmental, or religious concerns; health reasons; gustatory reasons; and, occasionally, eating disorders (Barr & Chapman, 2002; Beardsworth & Keil, 1992). Environmental and religious concerns were deemed the most common motivators. Other studies found that health concerns played a major role in the motivation of a majority of their participants (Barr & Chapman, 2002). However, it has also been reported that health reasons were the most common motivation for returning to an omnivorous diet. This switch is likely due to the fact that health based vegetarians tend to make their changes more gradually and are typically more flexible with their diet (Barr & Chapman, 2002). This present study, however, did not take into account the motivation of each self-reported vegetarian participant. This missing variable in college-aged vegetarians may be of interest for further research.

Along with generally consuming a more healthful diet, vegetarians also have earned a reputation of being overall healthier people. They are often associated with living in a more healthy and mindful manner by participating in more regular exercise, avoiding fattening or sugary foods, and avoiding alcohol and smoking. As it becomes a more mainstream diet option, many unhealthy vegetarian diets are springing up (Howton, 2014). People assume that by cutting out meat they are doing their body a favor by reducing saturated fat consumption. However, vegetarians who consume large amounts of dairy or vegan meat replacements as a protein source are often not choosing a healthier

option (Howton, 2014). Because the meat replacements are still processed foods, vegetarians who consume large quantities of these may not find the same health benefits as vegetarians who regularly eat a whole food diet (Howton, 2014). Information regarding vegetarian diets is not part of most public knowledge, and this misinformation may contribute to the numerous myths surrounding plant-based diet choices (Howton, 2014). This lack of nutrition knowledge is not uncommon among the American public.

The purpose of this study was to assess the knowledge and perceptions of vegetarian diets of students at the University of Mississippi. It is hypothesized that most respondents will assume vegetarians purchase organic food more frequently, get their daily serving of vegetables, exercise more regularly, smoke less, not consume alcohol or use drugs, and not consume energy drinks or soda. College students are regarded as the future leaders of society, so it is important to gauge the knowledge and perceptions held among this group. Even with a greater focus on preventative health, there are a shocking number of people who are unaware of what defines a vegetarian, let alone that there are many different kinds of vegetarian diets. To the author's knowledge, the current literature does not document any research on college-aged students and how they view vegetarianism.

CHAPTER II: REVIEW OF THE LITERATURE

The Vegetarian Resource Group conducted a poll of 2,030 American adults to collect data about the number of vegetarians and vegans in the United States. They found that approximately 4% of the U.S. population follows a vegetarian diet, meaning they never consume meat, fish or poultry (Stahler, 2014). There was no significant difference between males and females, ethnicities, and region of the country. This was surprising to the researchers, as most assumed they would see a difference between these demographic groups. Based on these findings, it appears that there is not one specific type of person who identifies as a vegetarian. The vegetarian diet makes up part of that person's identity rather than the person's identity signifying the diet.

Fox and Ward (2008) investigated how becoming vegetarian plays into a person's overall identity and found that restrictive food choices tend to be the easiest way for a person to stick to their health, ethical and religious beliefs. The researchers also made the distinction between a "health vegetarian" and an "ethical vegetarian", which implies that there are varied reasons that a person would eliminate meat from their diet. Some of the most common reasons were for overall health, reducing risk of some chronic diseases, animal rights, and environmental concerns. As would be expected, "health vegetarians" are those who refrain from meat products in order to experience the health benefits associated with a vegetarian diet (Fox, Ward, 2008). "Ethical vegetarians", on the other hand, are those who do not eat meat based on their concern for animal welfare and environmental issues (Fox, Ward, 2008). These distinctions offer an interesting

perspective on the idea of vegetarianism. The authors argue that people who identify strongly in one category or the other feel more “grounded” in their identity as a vegetarian (Fox, Ward 2008). Having a label on the type of vegetarian they consider themselves allows them to have a more concrete definition of their self.

Purchasing Organic Food Items

In an article from *The Journal of Consumer Behavior*, the authors examined the reasoning behind choosing organic food over conventionally grown food, and, like Fox and Ward, documented how food choices impact a person’s identity. Much of the focus was placed on a consumer’s attitude toward organic food and how these decisions become ethical issues rather than just a buying decision.

The researchers note that people usually begin consuming organic food due to health concerns (Honkanen, Verplanken, Olsen, 2006). This may be the important factor in people’s minds when purchasing food, but it is also noted that marketers cannot advertise in this way due to lack of empirical data related to the benefits of organic versus conventional food (Honkanen, Verplanken, Olsen, 2006). However, the idea that health may be the basis for most people to choose organic food could link this behavior with becoming vegetarian. Both lifestyle choices have a strong association with the perception of living a healthy life.

Because organic food has become associated with a healthy lifestyle, people begin to look past any negative associations with it. In a study done in Romania, a majority of people (85%) first perceive organic food as being “healthy” over “tasty”, “expensive”, “with bad taste”, or “difficult to find” (Petrescu, Oroian, Proorocu, Mihaiescu, Paulette,

Varban, 2013). Those who choose to purchase organic food, regardless of expense, appear to be more conscious of their health than those who refrain from buying organic food due to the cost.

Dairy and Meat Consumption

A study by Barr and Chapman (2002) surveyed women who are vegetarian, former vegetarians, or have never been vegetarian to compare their perceptions of meat and dairy compare. The researchers were careful to note that all vegetarian respondents were self-defined. They included a range of vegetarians from those who occasionally eat fish or poultry to strict vegans.

The perceptions of vegetarians and non-vegetarians have regarding red meat differed significantly. Vegetarians tended to perceive red meat as very unhealthy in fat content and potentially containing added antibiotics or hormones. Non-vegetarians were also concerned about the fat content of red meat, but tended to agree less with the idea that it could contain unhealthy amounts of added hormones and/or antibiotics. In the data regarding perceptions of dairy products, there were fewer differences between the groups. The most statistically significant responses were also in reference to the unnatural additions of hormones and/or antibiotics in dairy (Barr, Chapman, 2002).

It is often difficult for consumers to find or know the quality of meat, especially beef, that they will be purchasing in the grocery store. Often, purchases are made based on previous experiences with certain brands or qualities of beef (Banovic, Fontes, Barreira, Grunert, 2012). Consumers make their judgments on the meat based on intrinsic and extrinsic factors. Intrinsically, consumers will look at the color of the meat and fat

content. Extrinsicly, consumers will be thinking about brands, price, and region of origin (Banovic, Fontes, Barreira, Grunert, 2012). As consumers purchase more meat, they form their own personal experiences with various brands and different types of meat. These could be positive experiences, after which they continue to go back for more. They could also be very negative experiences, after which they switch brands or meat types or discontinue the consumption of meat altogether. Consumption of red meat has been associated with increased risk of cardiovascular disease and hypertension. The strength of correlation depends on the level of processing of the meat. There is a weak correlation between the consumption of unprocessed red meat and cardiovascular disease (CVD); but the correlation between consumption of processed red meat has a strong link to CVD (Lajous, Bijon, Fagherazzi, Rossignol, Boutron-Ruault, Clavel-Chapelon, 2014). This increased risk for hypertension and CVD is mainly due to the high content of sodium in processed meats. As the sodium level increases, the intravascular pressure increases as well due to higher water retention (Lajous, Bijon, Fagherazzi, Rossignol, Boutron-Ruault, Clavel-Chapelon, 2014). Hypertension was found to be more prevalent among those who consume red meat than in non-meat eaters (Lajous, Bijon, Fagherazzi, Rossignol, Boutron-Ruault, Clavel-Chapelon, 2014). Those who do not consume any meat put themselves at lower risk for developing diseases such as hypertension.

From an environmental perspective, meat production and consumption can be some of the most harmful agriculture for the environment. To produce meat and dairy, large amounts of land, plant products for animal feed, and water are required (de Bakker, Dagevos, 2012). This practice is incredibly energy consuming and environmentally harmful. In order to feed the growing global population, food industries need to shift

more towards a sustainable, plant-based diet, and put less emphasis on animal products (de Bakker, Dagevos, 2012). However, because eating meat and other animal products has become much more common in almost all cultures around the world, any changes made to the meat and dairy consumption would require a major cultural shift to be successful (de Bakker, Dagevos, 2012).

In order to get consumers on board with the sustainability movement, three different routes have been proposed. The first route would focus heavily on the production of meat hybrids, which would resemble the meat replacement products already available on the market (de Bakker, Dagevos, 2012). This route relies heavily on the technology side of food production so that acceptable and tasty products could be made. This would be a more stealthy method to get consumers to consume less meat. However, consumers could turn it around and feel that food companies were being dishonest and end up consuming those products less (de Bakker, Dagevos, 2012).

The second route focuses on giving the consumer moderate involvement in the cultural shift to plant-based diets. Strategies in this route include serving smaller portions of meat and participating in regular meat-free days (de Bakker, Dagevos, 2012). The main challenge to overcome here is making sure the meatless meals are seen as healthy and sustainable, but also as “good” replacements for the normal meat containing meal (de Bakker, Dagevos, 2012). This would normalize the practice of being a flexitarian (someone who generally avoids meat, but will consume it on special occasions) by making meatless days more common (de Bakker, Dagevos, 2012).

The final method would focus on an entire cultural shift away from the current consumer patterns (de Bakker, Dagevos, 2012). This puts consumer values at the

forefront of the meat reduction efforts. It would require people to be more conscious of their daily food decisions with an increase in “food awareness” (de Bakker, Dagevos, 2012). This is often seen as a more radical approach as it is associated with political and ethical motives. Vegetarians associated with this movement are often motivated by health concerns, animal welfare, and environmental sustainability (de Bakker, Dagevos, 2012). These three routes give consumers and policy makers a few ideas for reducing the global consumption of animal products with concern for the environment.

Vegetable, Fruit, and Grain Consumption

When someone says they “could not live without meat”, they may not be speaking in a literal sense; however, there is a common myth that humans cannot get proper nutrition without consumption of animal products (Howton, 2014). In the latest edition of MyPlate recommendations, the United States Department of Agriculture has stated that a vegetarian diet is sufficient for providing all necessary nutrients (Tips for Vegetarians, 2010). Consuming a vegetarian diet, comprised largely of fruits, vegetables, and whole grains, does allow for a person to obtain adequate nutrition. It may even be beneficial in improving weight maintenance through lower energy intake and increased satiety (Rolls, Ello-Martin, Tohill 2004). Because fruits and vegetables have such a high water content, high fiber, and lower fat levels, they tend to fill a person up without adding significant amounts of calories to the diet. A person who consumes a diet high in fruits, vegetables, and grains will not only achieve adequate nutrition, but may also find weight loss, or weight maintenance, to be easier (Rolls, Ello-Martin, Tohill, 2004).

Often, people assume that a plant-based diet does not provide enough protein or calcium since these nutrients are commonly associated with meat and dairy products. However, all plants have at least some protein from their structural components (Howton, 2014). This knowledge could alleviate some worries over vegetarian and vegan dietary protein levels. Similarly, many vegetables also contain sufficient amounts of calcium (Howton, 2014). Dark leafy greens, legumes, and nuts are just a few of the best plant-based sources of calcium. It is mainly due to media advertising that Americans have the notion that they must consume dairy in order to get their proper amounts of calcium for bone health (Howton, 2014). However, several studies have shown that exercise is the best thing for bone health, whether one chooses dairy or plant-based sources of calcium (Giangregorio, Thabane, Adachi, Ashe, Bleakney, Braun, Cheung, Fraser, Gibbs, Hill, Hodsman, Kendler, Mittmann, Prasad, Scherer, Wark, Papaioannou, 2014; Ishikawa, Kim, Kang, Morgan, 2013; Patience, 2015).

Iron intake is normally of concern for anyone who does not consume red meat. Serum ferritin concentration has been positively associated with consumption of fresh meat and other meat choices (Leonard, Chalmers, Collins, Patterson, 2014). Vegetarians were noted as having a higher overall knowledge of food choices than non-vegetarians, however, they still had significantly lower serum ferritin levels despite a similar intake of iron containing foods. This discrepancy is likely due to a higher consumption of non-heme iron sources than heme iron sources. Heme sources are animal products, and are absorbed by the body much more readily than non-heme sources. Non-heme sources also may contain other nutrients that slow or inhibit the absorption of iron even further (Leonard, Chalmers, Collins, Patterson, 2014).

Vitamin B₁₂ is another nutrient deficiency that is commonly associated with vegetarians and vegans. A majority of lacto-vegetarians, lacto-ovo-vegetarians, and vegans have B₁₂ deficiency (Pawlak, Parrott, Raj, Cullum-Dugan, Lucas, 2013). Vitamin B₁₂ is only produced by microorganisms, so it cannot be naturally occurring in any plant-based source. Meat, seafood, eggs and dairy products are the only sources of B₁₂ in the diet. This deficiency is more prevalent among vegans than other types of vegetarians due to the complete absence of any naturally occurring B₁₂ in a vegan diet (Pawlak, Parrott, Raj, Cullum-Dugan, Lucas, 2013). However, all types of vegetarians have to be conscious of their B₁₂ intake.

Vegetarians and vegans who supplement vitamin B₁₂ may still be subject to deficiency. This may be due to taking the supplements less frequently than suggested or taking supplements that do not have an appropriate dose in them for treating deficiency. It has been suggested that a dose at least 200 times the Recommended Daily Allowance may be needed for the most ideal results (Pawlak, Parrott, Raj, Cullum-Dugan, Lucas, 2013). The length of time a person has been vegetarian or vegan also determines their level of deficiency. It was found that children who were vegetarian from birth had higher rates of deficiency than children who adopted the lifestyle later on. This may be associated with maternal intakes of B₁₂ during pregnancy (Pawlak, Parrott, Raj, Cullum-Dugan, Lucas, 2013). With deficiency being so prevalent, but so manageable with proper care, it is suggested that vegetarians and vegans try supplementing when possible.

Making changes to long-standing lifestyle choices can be challenging. Adding more fruits, vegetables, and whole grains into one's diet is no different. However, adding plant-based nutrients into one's daily life can be one of the most beneficial changes one

could make. Vegetarians and vegans do tend to have a lower body mass index (BMI) and overall body weight than people who consume animal products (Howton, 2014). This reduction in weight can be attributed to a generally higher intake of fruits, vegetables, and whole grains.

With the addition of plant-based whole foods, people also tend to decrease their intake of sugar and high fat foods (Epstein, Gordy, Raynor, Beddome, Kilanowski, Paluch, 2001). When someone focuses on removing sugar and high fat foods from their diet, there is not always an addition of more fruits and vegetables to go along with it (Epstein, Gordy, Raynor, Beddome, Kilanowski, Paluch, 2001). This paradox is seen because people tend to be more successful with a dietary change when they focus on what they are adding to their diets rather than what they are taking away (Epstein, Gordy, Raynor, Beddome, Kilanowski, Paluch, 2001). When a person thinks of taking something out of their diet or restricting a food group, it seems more like punishment. If the focus is on the food they get to add to their diet, it seems far more reward oriented. This shift to a more positive mindset could also be beneficial in overall healthy lifestyle changes outside that of diet choices.

Energy Drink and Soda Consumption

Energy drinks, sodas, sports drinks, and other sugar-sweetened beverages are common drink choices among college students. These beverages are more commonly consumed among adults aged 18-24 than any other age group (Park, Onufrak, Blanck, Sherry, 2013). This may be related to the fact that energy drinks and sports drinks are marketed mainly to that age group and they tend to be consumed in a social setting.

Nearly three quarters of college students who drink energy drinks and soda will do so away from home and with other people (Park, Onufrak, Blanck, Sherry, 2013). Research has suggested that energy drinks and sodas are often consumed in conjunction with alcohol. College students tend to consume alcohol when they experience social interactions (Burke, Warziski, Styn, Hudson, Sereika, 2008). This supports the idea that energy drinks/sodas are consumed with others and/or in a social environment.

Energy drinks and sports drinks are similar in nature, but they were each associated with varying behaviors. Energy drinks have been positively associated with cigarette smoking. Sports drinks, on the other hand, have been associated with more healthful behaviors such as eating more fruits and vegetables and participating in physical activity (Park, Onufrak, Blanck, Sherry, 2013). This suggests that sports drinks may be perceived as healthier beverage choices than energy drinks or sodas. This present study did not include sports drinks when surveying behaviors related to sugar sweetened beverages.

Alcohol Consumption

Many college students choose to consume alcohol with their newfound freedom and space from parents. Approximately 45% of college students report recent heavy drinking (Reid, Carey, Merrill, Carey, 2015; Buscemi, Martens, Murphy, Yurasek, Smith, 2011). Over the last 20 years, research has shown a decline in heavy drinkers among men and an increase in male abstainers; however, data for college females has changed in the exact opposite way (Hensel, Todd, Engs, 2014). Consuming five or more drinks for men or four or more drinks for women is considered binge drinking. College female binge

drinkers have increased (46% to 52%) while male binge drinkers have decreased (67% to 57%) (Hensel, Todd, Engs, 2014). Research also suggests that members of Greek organizations are more inclined to participate in heavy drinking episodes than their non-Greek counterparts (Buscemi, Martens, Murphy, Yurasek, Smith, 2011). The researchers believe this may come from sort of a group mentality, as many Greek organizations require collective participation in all events.

Efforts to decrease alcohol consumption are usually short lived. There will be initial decreases in consumption, but the results decay with time (Reid, Carey, Merrill, Carey, 2015). It has been suggested that peer acceptability and social support will be required to help students reduce their amounts alcohol if they are “treatment-seeking”. Conversely, a student’s social setting can induce riskier behaviors depending on the actions of the individuals around them (Reid, Carey, Merrill, Carey, 2015). The social culture a student is active in can dictate when they initiate treatment as well as how well they maintain it.

Buscemi, Martens, Murphy, Yurasek, and Smith (2011) believed that participation in physical activity might be successful in decreasing heavy episodes of drinking among college students. Their research found that while Greeks and non-Greeks differ in alcohol consumption, there was no significant difference between the two groups for levels of physical activity. Males and Greeks had a positive relationship between alcohol consumption and physical activity while females and non-Greeks did not. The researchers also differentiated between moderate and vigorous intensity exercise and found that intensity did not change the relationships within the subgroups of college students.

The positive relationship within Greek communities may go back to the idea of collective participation. Fraternity and sorority parties provide an environment conducive to heavier drinking. Conversely, many Greek organizations participate in athletic competitions, club sports and/or intramural teams providing their members many opportunities for engagement in physical activity. It has been shown that an increase in exercise can lead to reductions in alcohol consumption or reduce other substance abuse; however, it has also been shown that many college students are able to maintain heavy levels of drinking while still participating in adequate amounts of exercise (Buscemi, Martens, Murphy, Yurasek, Smith, 2011).

Lifestyle Choices

Physical activity among college students does tend to decline from high school. This decrease in activity may be related to the environment and behavior changes often seen in college students, especially freshman (Yoon, Kim, Lee, 2014). This is important to note because obesity has grown more in the college-age population than any other age group over the same time period (King, Vidourek, English, Merianos, 2012). Many college students find it difficult to maintain physical activity levels due to the new schedule they are on. Most students acknowledge perceived barriers and self-efficacy as main reasons for not participating in vigorous physical activity. These barriers include schoolwork, lack of sleep and motivation, social invitations, and being unfamiliar with university gym or program environment (King, Vidourek, English, Merianos, 2012). Research has shown that physical activity levels in college do tend to extend into post-college habits (King, Vidourek, English, Merianos, 2012). Students who are unable to

find time or motivation to begin workout programs during college may find it even more difficult to do so once they are in the working world.

A study looking specifically at college freshman found that living on-campus or off-campus makes a difference in the student's activity level and food intake. Students who lived on-campus were found to be more physically active than those who lived off-campus. The difference was only found in low intensity physical activity, which could be attributed to a greater number of steps taken by the on-campus students (Yoon, Kim, Lee, 2014). The parking lots used by off-campus students were closer, on average, to classrooms than the dorms were to the classrooms (Yoon, Kim, Lee, 2014). This distance made up a large portion of the number of steps students took each day. There was not a difference in moderate or vigorous physical activity.

A difference was also seen between students living on-campus and living off-campus for a number of other health related factors. The total number of calories consumed by on-campus students, especially females, was much higher than their off-campus counterparts (Yoon, Kim, Lee, 2014). This can be attributed to the use of a meal plan, which typically sports larger portions and/or all you can eat options. On-campus students reported eating few fruits and vegetables, however, the reasoning behind this was not reported (Yoon, Kim, Lee, 2014). Smoking habits between on-campus and off-campus students did not differ. Students living on-campus did, however, tend to consume alcohol in larger quantities than off-campus students reported (Yoon, Kim, Lee, 2014). Alcohol consumption has been related to social settings in college, which may suggest that on-campus housing provides more of a social environment for drinking.

A survey conducted in British Columbia (Bedford, Barr, 2005) looked into the lifestyle choices of a population representative sample of adults who indicated whether or not they follow a vegetarian diet. Demographics, some lifestyle behaviors, nutrient intake, and various nutrition concerns of male and female vegetarians and non-vegetarians were investigated. This study found that vegetarian respondents had a lower BMI, lower intakes of total fat, saturated fat and cholesterol, and higher intakes of fiber (Bedford, Barr, 2005).

Bedford and Barr (2005) found that the female vegetarian respondents were more likely to engage in strenuous physical activity than their non-vegetarian counterparts. They also indicated more frequently that they were in the maintenance stage of exercise, suggesting a more consistent and long-lasting dedication to being physically active. This divide was not found in the male respondents. Smoking was another lifestyle choice that was included in this investigation. In both male and female participants, the vegetarian respondents were less likely to be smokers. Avoiding this behavior is a major indication of living in a health conscious manner. The results of the survey (increased supplement use, higher intakes of essential nutrients and produce, lower rates of smoking, higher physical activity, and lower BMI) show a more health conscious lifestyle among vegetarian adults.

As stated previously, people following vegetarian diets may show greater concern for their overall well-being. Starting a vegetarian diet has been shown as a successful diet for weight loss (Burke, Warziski, Styn, Hudson, Sereika, 2008). Weight loss achieved by plant-based diets has also been seen as more sustainable than by a standard weight loss diet (Burke, Warziski, Styn, Hudson, Sereika, 2008). Following these diets puts a person

at less risk for becoming overweight or obese. Decreasing one's risk for obesity also decreases the risk for developing various diseases such as diabetes, heart disease, and hypertension (Burke, Warziski, Styn, Hudson, Sereika, 2008). People who follow vegetarian diets for weight loss tend to find it easier to remain within calorie and fat gram restrictions than those who follow standard weight loss diets (Burke, Warziski, Styn, Hudson, Sereika, 2008).

CHAPTER III: METHODS

This study was reviewed and approved by the University of Mississippi's Institutional Review Board. A questionnaire was designed to test the respondent's knowledge and perceptions of people who follow a vegetarian diet. There were also questions dealing with the respondent's personal behavior in regards to the common perceptions. In the 2014 spring semester, the survey was administered in three sections of NHM 311 (Nutrition), one section of HP 191 (Personal and Community Health), and among the Campus Recreation group fitness instructors. These groups were selected based on a large number of participants and the diversity of academic major or knowledge background. Once all of the surveys were collected and checked for completion, the data were inputted into SPSS with number codes. Data analysis was conducted using the IBM SPSS Statistics system (version 22).

CHAPTER IV: RESULTS

All of the participants were over the age of 18 (n = 187), with a majority of them being female (n = 130, 69.5%). Of the completed surveys (n = 187), there were 180 non-vegetarian respondents and 7 vegetarian respondents. There was no significant difference between the perceptions held by vegetarians and the perceptions held by non-vegetarians (p>0.05). Vegetarian consumption of alcohol/drugs and energy drinks/soda were the only places that discrepancies were seen between the majority choices in the two groups (Table 1).

Table 2 shows a breakdown of behaviors reported by all survey respondents. Vegetarian participants were more likely to refrain from consuming energy drinks or soda (p = 0.05). By percentage, vegetarians were more likely to consume the recommended daily serving of vegetables; however, there was no significant difference between the two groups for this behavior (p > 0.05). Both groups showed similar patterns in organic food purchases (p > 0.05), weekly physical activity (p > 0.05), type of physical activity (p > 0.05), and alcohol consumption (p > 0.05).

Table 1: Perceptions					
	Vegetarians		Nonvegetarians		x ²
	Yes	No	Yes	No	
Q7: Most vegetarians purchase organic food regularly	5 (71.4%)	2 (28.6%)	113 (62.8%)	67 (37.2%)	0.217
Q10: Most vegetarians get the recommended serving of vegetables	5 (71.4%)	2 (28.6%)	159 (88.3%)	21 (11.7%)	1.785
Q13: Most vegetarians participate in regular physical activity	5 (71.4%)	2 (28.6%)	111 (61.7%)	69 (38.3%)	0.273
Q15: Most vegetarians smoke	0 (0%)	7 (100%)	11 (6.1%)	169 (93.9%)	0.455
Q17: Most vegetarians consume alcohol or use drugs	5 (71.4%)	2 (28.6%)	82 (45.6%)	98 (54.4%)	1.183
Q19: Most vegetarians consume energy drinks or soda regularly	4 (57.1%)	3 (42.9%)	78 (43.3%)	102 (56.7%)	0.522

Table 2: Behaviors					
	Vegetarians		Nonvegetarians		x ²
	Yes	No	Yes	No	
Q6a: How often do you purchase organic food? 1-2 times/month	3 (42.9%)	4 (57.1%)	60 (33.3%)	120 (66.7%)	5.399
Q6b: How often do you purchase organic food? Once/week	4 (57.1%)	3 (42.9%)	47 (26.1%)	133 (73.9%)	5.399
Q6c: How often do you purchase organic food? 2-3 times/week	0 (0%)	0 (0%)	17 (9.4%)	163 (90.6%)	5.399
Q6d: How often do you purchase organic food? 3-5 times/week	0 (0%)	0 (0%)	5 (2.8%)	175 (97.2%)	5.399
Q6e: How often do you purchase organic food? 5+ times/week	0 (0%)	0 (0%)	2 (1.1%)	178 (98.9%)	5.399
Q6f: How often do you purchase organic food? Never	0 (0%)	0 (0%)	49 (27.2%)	131 (72.8%)	5.399
Q8: Do you get your daily-recommended serving of vegetables?	5 (71.4%)	2 (28.6%)	84 (46.7%)	96 (53.3%)	1.656
Q11a: How often do you participate in physical activity? 1-2 times/month	1 (14.3%)	6 (85.7%)	7 (3.9%)	173 (96.1%)	3.095
Q11b: How often do you participate in physical activity? Once/week	1 (14.3%)	6 (85.7%)	12 (6.7%)	168 (93.3%)	3.095
Q11c: How often do you participate in physical activity? 2-3 times/week	1 (14.3%)	6 (85.7%)	57 (31.7%)	123 (68.3%)	3.095
Q11d: How often do you participate in physical activity? 3-5 times/week	2 (28.6%)	5 (71.4%)	61 (33.9%)	119 (66.1%)	3.095
Q11e: How often do you participate in physical activity? 5+ times/week	2 (28.6%)	5 (71.4%)	42 (23.3%)	138 (76.7%)	3.095
Q11f: How often do you participate in physical activity? Never	0 (0%)	0 (0%)	1 (0.6%)	179 (99.4%)	3.095
Q12a: Do you participate in running/jogging?	5 (71.4%)	2 (28.6%)	132 (73.3%)	48 (26.7%)	0.012
Q12b: Do you participate in walking?	3 (42.9%)	4 (57.1%)	122 (67.8%)	58 (32.2%)	1.888
Q12c: Do you participate in cycling/spinning?	3 (42.9%)	4 (57.1%)	39 (21.7%)	141 (78.3%)	1.737
Q12d: Do you participate in swimming?	1 (14.3%)	6 (85.7%)	17 (9.4%)	163 (90.6%)	0.182
Q12e: Do you participate in yoga/pilates?	3 (42.9%)	4 (57.1%)	35 (19.4%)	145 (80.6%)	2.281
Q12f: Do you participate in weight lifting/strength training?	4 (57.1%)	3 (42.9%)	102 (56.7%)	78 (43.3%)	0.001
Q12g: Do you participate in cardio based group fitness classes?	0 (0%)	7 (100%)	67 (37.2%)	113 (62.8%)	4.060*
Q12h: Do you participate in another type of activity?	0 (0%)	7 (100%)	25 (13.9%)	155 (86.1%)	1.122
Q12i: You do not participate in physical activity.	0 (0%)	7 (100%)	1 (0.6%)	179 (99.4%)	0.039
Q14: Do you smoke?	1 (14.3%)	6 (85.7%)	11 (6.1%)	169 (93.9%)	0.750
Q16: Do you consume alcohol or use drugs?	5 (71.4%)	2 (28.6%)	114 (63.3%)	66 (36.7%)	0.191
Q18a: How often do you consume soda/energy drinks? 1-2 times/month	2 (28.6%)	5 (71.4%)	37 (20.6%)	143 (79.4%)	10.993*
Q18b: How often do you consume soda/energy drinks? Once/week	0 (0%)	0 (0%)	40 (22.2%)	140 (77.8%)	10.993*
Q18c: How often do you consume soda/energy drinks? 2-3 times/week	0 (0%)	0 (0%)	33 (18.3%)	147 (81.7%)	10.993*
Q18d: How often do you consume soda/energy drinks? 3-5 times/week	0 (0%)	0 (0%)	11 (6.1%)	169 (93.9%)	10.993*
Q18e: How often do you consume soda/energy drinks? 5+ times/week	0 (0%)	0 (0%)	19 (10.6%)	161 (89.4%)	10.993*
Q18f: How often do you consume soda/energy drinks? Never	5 (71.4%)	2 (28.6%)	40 (22.2%)	140 (77.8%)	10.993*

* Value has statistical significance (p < 0.05)

CHAPTER V: DISCUSSION

The results show a representative sample of vegetarians comparable to the percentage in the national population. Approximately 4% of the U.S. population considers themselves vegetarian while 3.7% of the respondents in this study consider themselves vegetarian. This allowed for a fairly representative comparison, however, statistics were challenging due to the small number of vegetarians compared to non-vegetarians. Therefore, analysis of the data was strictly descriptive.

Most of the questions regarding perceptions had similar results between the two groups. Consistent with the hypothesis, a majority of the respondents from both groups indicated that they believed most vegetarians purchase organic food regularly. All vegetarian participants noted that they purchase organic food either 1-2 times each month or once each week. This result seems consistent with the perceptions held by all survey participants. The most common response among non-vegetarians was purchasing organic food 1-2 times each month ($n = 60, 33.3\%$). This may suggest that college-aged adults overall, rather than just vegetarians, have a greater tendency to purchase organic food during trips to the grocery store. Most of the available literature reviewed the motivation behind purchasing organic food. It is unclear whether participants in this study are purchasing organic food for health reasons, sustainability, or due to increased popularity because the motivation behind organic food purchases was not questioned in this survey.

A majority of both groups also believed that most vegetarians get the recommended daily serving of vegetables (2-4 cups of vegetables recommended). The

survey results show that a majority (n = 5, 71.4%) of vegetarian respondents did get the daily-recommended amount of vegetables. It is interesting that two vegetarian respondents did not believe that most vegetarians get the recommended serving of vegetables, when eating vegetables should be such a pinnacle part of the diet. However, there are two vegetarians who said they personally did not get the recommended serving. This may suggest that those two respondents, if they are the same people in both questions, are basing their perceptions entirely on their own experiences.

Non-vegetarian respondents were not as conscious of consuming adequate amounts of vegetables. The results were split almost in half with a slightly higher percentage of non-vegetarians not getting the proper serving of vegetables each day. This shows that a vegetarian diet may allow a college student to consume more vegetables daily due to the more restrictive nature of vegetarianism. This is important to consider for most Americans since nearly two thirds of adults are overweight or obese. This rise in obesity has been attributed to frequent fast food consumption as well as generally high-fat diets (Kruger, Greenberg, Murphy, DiFazio, Youra, 2014). Also, as was noted in the literature review, a vegetarian diet can be more successful as weight loss or management diet than a conventional diet. This is due mainly to the consumption of fruits, vegetables, and whole grains, which all have a higher level of water and fiber.

Most survey participants overall participated in physical activity regularly. Four out of the seven vegetarian respondents said they participate in physical activity at least three times every week. With this majority response, this vegetarian sample does tend more towards regular exercise practices. The same is true for the non-vegetarian respondents. The largest percentage of non-vegetarians reported physical activity

participation three to five times per week. The second most common response indicated that participants engaged in physical activity two or three times per week.

These results are consistent with perceptions held by the participants. A majority of both groups believed that vegetarians participate in a form of physical activity regularly. However, with such similar results between the vegetarian and non-vegetarian participants, it is difficult to attribute the diet to a connection with physical activity. College students do not necessarily exercise more than other age groups. In fact, their overall physical activity level decreases significantly between high school and college (Pauline, 2013). Vigorous activity levels decline more than low or moderate physical activity (Yoon, Kim, Lee, 2014). A study has found that a large majority of college students do not meet the exercise recommendations set forth by the American College of Sports Medicine and the American Heart Association (Pauline, 2013). The results of the present study are inconsistent with other study findings. A majority of questionnaire respondents are physically active at least three days per week. However, the questionnaire did not take into account the intensity of activity that participants were engaging in. Intensity would be important to note because vigorous physical activity levels are the ones that decline most when students go to college. Low and moderate intensity levels may decline in some students, but, overall, these levels may tend to stay relatively consistent (Yoon, Kim, Lee, 2014).

The type of physical activity was also similar between the two groups. The highest percentage of respondents said they participate in running and/or walking. There were also a high number of participants who indicated strength training as a common form of exercise. There were very low numbers of students who said they swam, did

Pilates or yoga, or did another form of physical activity. Again, these similarities between the two groups in form of physical activity do not allow for an adequate comparison of diet to exercise.

There were no vegetarian respondents who believed that most vegetarians smoked. A very small number of non-vegetarians ($n = 11$, 6.1%) believed that most vegetarians do smoke. These beliefs seemed to line up with the actual behaviors of the vegetarian participants as only one respondent reported smoking. Due to the small number of participants who were vegetarian, the data appears to be skewed when compared to the non-vegetarian group. When looking solely at percentages, it appears to be more common in vegetarians to smoke. However, based on the actual number of people, one will notice that more non-vegetarians reported smoking. It is unclear whether there is a difference between the two groups because of the discrepancies in number of participants. From high school to college, the number of students who smoke cigarettes does increase. However, recent years have shown a decline in the number of students who smoke because of new policies and laws that prohibit or restrict smoking in public places and on university campuses (Yoon, Kim, Lee, 2014).

Assessing alcohol consumption or drug use showed a little more discrepancy between the two groups. A majority of vegetarians participants ($n = 5$, 71.4%) believe that most vegetarians do consume alcohol or use drugs. Fewer than half of the non-vegetarians ($n = 82$, 45.6%) shared this belief. The behavioral aspect of the survey shows that a majority of both of the groups reported that they consume alcohol or use drugs. This makes it difficult to find any links between dietary choices and partaking in either of these activities. Most college students do consume alcohol (Yoon, Kim, Lee, 2014), so,

once again, the age range of survey participants may factor into the response to this question.

The final group of questions regarded consumption of energy drinks and soda. The perceptions held by the two different groups shows both are split nearly down the middle as to whether most vegetarians consume energy drinks and soda. A slight majority of vegetarians (n = 4, 57.1%) said yes while a slight majority of non-vegetarians (n = 102, 56.7%) said no. When looking at the behavioral data, it is apparent that the vegetarian respondents mainly do not consume these products. Most of them (n = 5, 71.4%) reported never drinking soda or energy drinks while the other two reported only drinking them one to two times per month. The non-vegetarian group sported a much wider variety in energy drink and soda consumption. The data shows that 42.8% of non-vegetarians reported never drinking them or only one to two times per month. However, there were 19 (10.6%) respondents who reported drinking energy drinks or soda five or more times each week. This wider range in frequency is most likely due to the sample size.

When the original hypothesis is considered, the data is not entirely what was expected. On the vegetarian side, a majority of them coincided with the hypothesis on organic food purchases, eating the recommended daily amount of vegetables, participating in physical activity, and smoking habits. However, findings in this group rejected the hypothesis in regards to consuming alcohol or using drugs and consuming energy drinks and soda. Many of these factors could also be attributed to the age range of participants, not necessarily their dietary habits.

Non-vegetarian participants had fairly similar results to their vegetarian counterparts. Again, the hypothesis was supported for organic food purchases, eating the recommended daily amount of vegetables, participating in physical activity, and smoking habits. Results of alcohol/drug use and energy drink and soda consumption suggest rejection of the hypothesis for this group. However, the perceptions were more split on the topic of alcohol consumption and drug use with non-vegetarians. The two groups were most comparable in their perception of smoking habits of vegetarians. Both groups strongly believed that most vegetarians do not smoke. It is unclear why this particular stereotype or perception is held more uniformly than others.

The main limitation of this study is the low number of vegetarian responses in comparison to the non-vegetarian responses. Although the percentage of vegetarians in the survey mimics the percentage of vegetarians in the U.S., the low number did not allow for reliable comparisons or significant statistical data. In future studies, researchers should focus more on recruiting relatively similar numbers of vegetarians and non-vegetarians rather than allowing for a representative percentage. These results can only be applied to college-aged students at the University of Mississippi since the entire sample population came from that campus. Similar research should be done on other college campuses in various regions of the U.S., as well as with different age groups. Taking broader samples of survey respondents should allow the researchers to recruit larger numbers overall. This would result in more reliable information and more consistent statistics. It may also be of interest to include research on the motivation behind the diet choices of vegetarian participants.

CHAPTER VI: CONCLUSION

The results of this survey showed a representative sample of the national vegetarian population based on the percentage of total population. However, the actual number of participants was too low to allow for solid statistical evidence to be drawn from the results. Based on a descriptive analysis of the results, there were not many significant differences between the vegetarian group and the non-vegetarian group. Both groups showed similar patterns in purchasing organic food, amount of participation in physical activity, type of physical activity and alcohol consumption. All of these similar traits could be linked to the age group of survey participants.

The vegetarian group did tend to have more consistent perceptions with the actual behaviors documented by all of the vegetarian respondents. This could suggest that people who follow the diet do tend to have a greater knowledge of what goes into being a vegetarian. Based on these results, non-vegetarians may not be exposed to this diet frequently, which causes a blind perception or stereotype of all people who choose not to eat meat. As more Americans become conscious of what they are eating, it would be beneficial to provide further resources and education on the various dietary choices available to those considering becoming vegetarian.

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