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## DIETARY HABITS AND KNOWLEDGE OF COLLEGE AGE STUDENTS

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Matthew R. Majors, Student

Dr. Kelly Webber, Major Professor

Dr. Kelly Webber, Director of Graduate Studies

DIETARY HABITS AND KNOWLEDGE OF COLLEGE AGE STUDENTS

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THESIS

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A thesis submitted in partial fulfillment of the  
requirements for the degree of Master of Science in the  
College of Agriculture, Food and Environment  
at the University of Kentucky

By

Matthew R. Majors, RD, LD

Lexington, Kentucky

Director: Kelly Webber PhD, RD, LD, Associate Professor

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2015

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## ABSTRACT OF THESIS

### DIETARY HABITS AND KNOWLEDGE OF COLLEGE AGE STUDENTS

College is a time of emerging identity and habit formation for students. One hundred and sixty-two (162) college students were surveyed via an internet based survey. The survey asked questions regarding dietary habits such as consumption of dairy, vegetables, fruit, and protein. The survey also examined dietary knowledge such as ability to read food labels. The students were divided into two groups for analysis, nutrition majors and non-nutrition majors. The two groups differed in Body Mass Index (BMI) ( $p=0.004$ ), but not nutrition knowledge ( $p=0.082$ ). The nutrition students had an average BMI of  $22.0 \pm 2.42$  and a nutrition knowledge score of  $2.44 \pm 0.60$ , while the non-nutrition majors had an average BMI of  $23.9 \pm 4.50$  and a knowledge score of  $2.22 \pm 0.55$ .

**KEY WORDS:** Dietary habits, knowledge index, weight, college student

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DIETARY HABITS AND KNOWLEDGE OF COLLEGE AGE STUDENTS

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## **Chapter 1: Introduction**

The obesity epidemic in America continues to grow. In order to obtain data concerning the overall health of both children and adults in the United States (US) the National Center for Health Statistics (NCHS), which is part of the Center for Disease Control and Prevention (CDC) conducts an annual survey known as The National Health and Nutrition Examination Survey (NHANES). NHANES is designed to assess the health and nutritional status of adults and children in the United States. The survey is unique in that it combines interviews and physical examinations. According to the NHANES 2011-2012 survey, the proportion of the obese US adults was 35.1% and those considered to be extremely obese was 6.4% (1). It was also found that an estimated 33.9% of adults were considered to be overweight (1). Furthermore, the data from the NHANES 2011-2012 survey indicated that an estimated 16.9% of children and adolescents age 2-19 are obese, and another 14.9% are overweight (2). Overweight and obesity is determined by dividing weight in kilograms by height in meters squared ( $\text{kg}/\text{m}^2$ ). The term overweight is defined as any adult with a Body Mass Index (BMI) greater than or equal to  $25 \text{ kg}/\text{m}^2$  to  $29 \text{ kg}/\text{m}^2$  and obesity is defined as having a BMI of  $30 \text{ kg}/\text{m}^2$  and above (3). Furthermore, a child is considered to be overweight when a child's BMI is at or above the 85<sup>th</sup> percentile and lower than the 95<sup>th</sup> percentile for children of the same age and sex (4).

One researcher, Dr. Jeffrey Jensen Arnett (5) classifies the ages of 18-25 as “emerging adulthood.” He describes this age demographic as a time where young people transition from adolescence to adulthood and begin developing views and behaviors, which will carry into adulthood(5). During this time the development of self-identity, changing support systems, and the shifting of interpersonal influences occur and set this

life stage apart from adolescence and adulthood(6). Nelson et al. shared Dr. Arnnets assessment of this particular population, suggesting that the college years have often been considered a time of “optimal health and well-being” (6). However, there appears to be a limited amount of data that is collected about this population. According to the CDC, obesity levels were lowest among college graduates, 22.1% for men and 17.9% for females (7). It was also found that for men, those who attended some college had the highest percentage of obesity, at 29.5% (7). However, this does not give one a snap shot of the current population of those attending college.

Research on this extremely diverse population is needed and will ultimately allow for colleges and universities to develop programs to combat the often referred to “freshman fifteen” weight gain, and educate this population about healthy eating and exercise patterns. Specific knowledge gained about this population will allow for the tailoring of health education programs to the specific problem areas identified by college students.

#### *Purpose*

The purpose of this study was to survey the dietary habits and knowledge of college students, and examine the differences in dietary knowledge and BMI classifications between nutrition and non-nutrition majors.

#### *Research Questions:*

1. Will nutrition majors have better nutrition knowledge and healthier BMI's than non-nutrition majors?
2. Will students' BMI and dietary practices reflect their nutrition knowledge?

## **Chapter 2: Literature review**

It is known that many college freshman gain weight (8). This is commonly referred to as the “freshman 15”. This weight gain can contribute to a risk of being overweight and obese later in life (8). Due to the difficulty associated with weight loss, strategies are needed to combat weight gain in college students.

### *Weight and body composition*

In the fall semester of 2004 at the Virginia Polytechnic Institute and State University, 163 freshmen were recruited for a study that required a 7--day food journal as well as weight and body composition measurement. Thirty-eight students gained more than 0.5 pounds and 20 students lost more than 0.5 pounds (8). It was also found that eleven students maintained their body weight. Initial BMI and percentage body fat were higher in subjects who lost weight, although differences were not statistically significant (8). Mean daily servings of dairy products were significantly greater in subjects who maintained weight (8). Subjects who gained weight ate breakfast on fewer days per week than those who did not eat breakfast regularly. This study suggested possible targets to be utilized to develop nutrition education materials for college students to help prevent weight gain (8).

In 2005, a Utah State University study was conducted that recruited 67 men and 118 women. The objective of this study was to track changes in weight, height, BMI, percent body fat, blood pressure, waist and hip circumference among freshmen during their first semester of college, by having participants complete a risk factor survey as well as being weighed and measured (9). In addition to these objectives this study examined a relationship between environmental factors and incidence of overweight/obesity and

weight gain (9). Positive correlations were observed among BMI, body weight, waist and hip circumference, percent body fat, and systolic blood pressure, as expected. Thirty-six percent of participants gained more than 2 kg during the fall semester (9). Among men, being overweight/obese at baseline was associated with first semester weight gain; no similar association was observed among women. This study concluded that weight gain during the first semester of college may be associated with identifiable and in some cases modifiable risk factors such as hypertension and diabetes (9). This study suggest that strategies aimed at preventing overweight/obesity and weight gain among college freshmen may decrease risk of obesity and related health problems later in life (9).

Another study that looked solely at weight gain and body changes in freshman examined changes that might occur to body weight, body composition, resting metabolic rate, diet and exercise in college freshmen during their first semester (10). For this study sixty-three students were followed for a single 16--week semester (10). Weight, body composition, resting metabolic rate, and physical activity were measured at baseline as well as at the conclusion of the study. At the end of the 16--week semester it was found that forty-four individuals gained  $\geq 2$  pounds, while 28 gained  $\geq 5$  pounds. A small but significant change in percent fat mass was found in the female population, however this was not found in men. There were no significant changes in resting metabolic rate or Calorie intake (10). However, correlations between change in weight and change in resting metabolic rate, change in weight and change in fat mass were significant. Individuals who met the American College of Sports Medicine minimum guidelines for exercise gained less weight than those who did not (10). These researchers conducted a follow--up study that consisted of a sub-set of students at one year. At one year, there was

no longer a significant weight gain from baseline (10). The results from this study support the notion that freshmen gain weight upon entering college and this weight gain is accompanied by an increase in fat mass in women. Furthermore, individuals who maintain moderate physical activity appeared to be protected from this weight gain (10). This study concluded that the follow up study suggest that this weight gain may not be sustained over an entire year (10).

#### *Transition to higher education*

The following study examined the differences of weight gain and behavior in males and females as they transitioned from high school to college (11). This study was conducted in 2005, and consisted of 379 college students (11). It was found that weight gains were greatest in males, with twenty-seven percent gaining weight. Furthermore, twenty-six percent of females also showed an increase in weight (11). This study also found that females were more than likely to maintain or lose weight (11). This study determined that many participants were unprepared for the transition from high school to college (8). Furthermore, peer-led classes providing strategies for managing healthful living during college were suggested in focus groups. Efforts to understand the college transition and interventions addressing the broad context of behavior are needed in order to help college students develop lifelong healthful habits (11).

In 2004, data were collected from female participants who attended three study visits, the first was the summer before entering college, the second was the fall semester and the last set of data were collected in the winter semester (12). The main outcome measure was body weight; others were height, body composition, waist circumference, dietary intake, and participation in physical and sedentary activities (12). The major

finding of this study was that there was a substantial increase in body weight of 2.4 kg during the first 6 to 7 months (12). Other increases included BMI , 22.3 kg/m<sup>2</sup> to 23.1 kg/m<sup>2</sup>, percent body fat, 23.8% to 25.6%; and waist circumference, 76.9 to 79.4 cm. Dietary energy intake did not increase; vigorous physical, but not strength building, activities increased; television use decreased; and computer use increased (12). This study concluded that the term “freshman fifteen” may be misleading since the average weight gain was significantly less (12). The results also suggested that a decrease in moderate physical activity could play a role in energy balance resulting in weight gain (12).

A study at Sam Houston State University examined 352 college freshmen with a two part questionnaire to gather insight into students living away from home for the first time (10). Data on nutrition-related behaviors of participants while living at home and after the first year of living away from home were obtained and analyzed (13). This study found that the average weight gain observed among these students was 10.78 pounds and of those 185 participants who reported weight gain, 69.7% were females. It was also found that 23% of students reported an average weight loss of 12.1 pounds and a smaller percentage maintained weight after living away from home (13). This study found that there was a significant change in alcohol consumption, physical activity, and specific food consumption such as vegetables and fruits when examining practices before and after leaving home, this was found to be true from both those who lost weight and those who did not lose weight (13). This study concluded that there was a substantial amount of changes in student’s nutrition related behavior after they leave home for college (13).

## *Dietary Habits*

Another study sought to identify health behavior change targets related to weight management in college students (14). This particular study examined first and second year students who majored in nutrition, foods, and exercise (14). This study found that body fatness was significantly higher in women than in men, and men consumed significantly more energy than women (14). However, there were no sex differences in percent of energy consumed from macronutrients, with carbohydrate, fat, and protein comprising approximately 50%, 35%, and 15% of total energy, respectively (14). Furthermore, it was found average daily intake of fruit, vegetables, and whole grains were not significantly different between men and women and were well below recommendations (14). Total fiber intake of the study sample was approximately half of recommended levels (14). It was found that students generally skipped breakfast or had something they could prepare in their dorm room, eat quickly, or carry to class (14). Lunch generally consisted of sandwiches, salads, or wraps, but also fast-food type meals that are available on campus (14). Dinners usually consisted of pasta, meat and potatoes, salad, burgers, and sandwiches (14). Students reported chips or crackers and sweets that they kept in their dorm rooms as their major snack source (14). Snack foods primarily came from an off-campus grocer, and rarely vending machines (14). Students generally drank water, juice, or sweetened beverages (14). It was also found when short on time, students tended to eat something quickly, usually fast foods (14). This study concluded that an adherence and long term adoption of healthful habits was key to weight gain prevention in this population (14).

The next study that is of interest examined the relationship between weight gain and dairy intake in college age students (15). This study more specifically looked at low fat dairy products and weight gain/loss (15). This study looked at 7-day diet journals from students in a freshman level nutrition course, as well as body measurements taken at baseline (15). It was found that the mean low fat dairy intake was less than half a serving a day (15). It was also found that the total amount of dairy consumed was approximately 1.5 servings a day (15). This study found that those who maintained weight reported consuming significantly higher amounts of low fat dairy than those who gained weight (15). It was found that low fat dairy intake may be associated with prevention of weight gain in college age students (15).

At a large Midwestern university a study was conducted comparing the differences on dietary trends, eating habits, and nutrition self-assessment and beliefs between males and females (16). This study utilized a questionnaire to obtain information on anthropometric measurements, use of specific diets, sources of nutrition knowledge, individuals with whom the respondent typically eats meals, as well as nutrition self-assessment and beliefs of college students (16). Men had significantly higher ( $P < 0.0001$ ) height, weight, and body mass index values than women. It was found that significantly higher percentages of women than men had tried a low-fat diet and a low-carbohydrate diet (16). Significantly lower percentages of women than men had never tried a diet (13). Significantly higher percentages of women than men reported gaining nutrition knowledge from family and magazines/newspapers (16). Significantly higher percentages of women than men agreed that they had too much sugar in their diets; that it is important to limit carbohydrate consumption, that it is important to limit the amount of fat



consumed to lose weight, and that they needed to lose weight (16). This study concluded that when health professionals are developing nutrition related material, they should take the difference found between males and females into account (16).

### *Dietary Knowledge*

The previous studies that were examined concentrated mainly on dietary habits of college age students. The following study examines college student's knowledge, attitudes and label use. A group of 537 students were randomly selected to investigate college student's nutrition knowledge (17). It was found that the majority of the responses came from female students (17). It is also interesting to note that the majority of those who responded were also non-smokers (17). Most of the participants were of normal weight and were classified as freshman and juniors (17). It was found that graduate and undergraduate students differed significantly in their attitudes and knowledge around nutrition (17). In fact, undergraduate students had a more positive attitude and higher nutrition knowledge than graduate students; no difference was noted on their label reading behavior (17). Women had significantly higher label reading behavior scores and nutrition knowledge than did men (17). Although the majority of students perceived food labels to be useful and easy to read, there was an inherent distrust of the truthfulness and accuracy of food labels (17).

In 2007, a study was conducted to investigate whether or not increased nutrition knowledge of dietary guidance actually translates into positive behavior (18). This was achieved through the use of a cross sectional study of 200 students who self-reported their eating habits (18). The majority of respondents were female and were between the age of 18 and 20 (18). This study found that the majority of students were classified as

moderately active (18). It was observed that, for fruit, dairy, protein, and whole grains, increased knowledge is related to increased likelihood of meeting dietary guidelines (18). Furthermore, it was found when asked about individual food choice, nutrition knowledge was related to making more healthful choices in every case. It appears that when posed with a question about a specific type of food, students are able to use their knowledge to make a more healthful choice (18). This study concluded that increased knowledge of dietary guidance does appear to be positively related to more healthful eating patterns among college students. The results of this study also suggest that overall better eaters have higher nutrition knowledge (18).

This study was conducted from January 2009 to May of 2010. Its purpose was to assess the dietary intakes and eating habits of female college athletes and compare them with the minimum sports nutrition standards. Participants were recruited from three university athletic departments (19). Anthropometric measurements such as height, weight body mass index (BMI), and body composition were collected. A single 24-hour recall was obtained on the student's first clinic visit by a qualified research assistant. A 3-day food record, a 24-hour recall, and a nutrition questionnaire were also utilized. The students' resting metabolic rate was determined using the Cunningham equation (19). The study found that fifty-two female collegiate athletes completed all the measurements and provided dietary data for the study. Nearly all athletes in the sample failed to match their energy intakes with their estimated energy needs (19). Furthermore, it was found that the majority of them also failed to meet their carbohydrate needs, even though the study utilized only the minimum carbohydrate needs. The t-tests indicated the energy and carbohydrate intakes were below the minimum recommended amount ( $p < .001$ ), with

only 9% of the participants meeting their energy needs (19). Seventy-five percent of the participants failed to consume the minimum amount of carbohydrates. It was found that the majority of the participants reported no regular breakfast, 36% consumed < 5 meals/day, and only 16% monitored their hydration status (19). It was recommended that greater efforts should be focused on increasing sports nutrition knowledge and improving eating habits among female college athletes in order to optimize their nutritional status (19). The study also recommended that sports physicians, nutritionists, as well as athletic trainers should be aware of these nutrition-related problems because inadequate dietary intakes and eating behaviors can negatively impact not only the quality of training and recovery, but also the nutritional status and overall health of female college athletes (19).

Another study examined the transition to higher education and the role that such a life changing event can have on health behaviors. The study was conducted from February to March of 2008 and then again from February to March of 2009(20). The study consisted of 291 randomly selected students. The students were followed their final year of high school through their second year of college (20). Dietary intake and physical activity were measured through the use of questionnaires, while BMI and waist circumference were measured objectively (20). The study found that on average students gained 2.7 kg with a greater increase in males (20). Active transportation and sport participation decreased. Some sedentary behaviors such as watching TV, and playing computer games did decrease, while other such as internet use and studying increased. The study also found that consumption of different foods decreased and alcohol consumption increased (20). The researchers also found that a higher decrease in sport participation, a higher increase in internet use and a lower increase in studying were

related to a greater increase in BMI (20). An increase in alcohol consumption only contributed to weight gain in males, whereas a decrease in fruit/vegetable intake only contributed to weight gain in females (20).

In summary, the literature has indicated that many different factors that contribute to weight gain or maintenance in college students. Some researchers found that weight gain may be attributed to those who consume breakfast less often than others, have a decrease in moderate exercise they previously participated in, and that the change from high school to college can impact students greatly in their dietary habits. Researchers also found strategies that can help college student decrease the risk of weight gain. Those included nutrition education for students entering college, an increase in moderate activity, and that an increase in overall nutrition knowledge can lead to better eating habits. It was also noted that nutrition education should consider the differences between males and females. Lastly, it was concluded that long term weight prevention can be linked to overall healthy habits.

### **Chapter 3: Methodology**

The research was conducted at the University of Kentucky through the Department of Dietetics and Human Nutrition. In order to explore the nutritional knowledge and practices of college students, students were recruited to participate in an internet-based survey. The survey consisted of fifty-eight questions related to dietary practices and nutrition knowledge, as well as information pertaining to the participant's demographics and background. The questions for the survey were obtained from several sources that had been utilized in previous research such as the Youth Risk Behavior Surveillance System (YRBS) 2007, survey questions from Jane Kolodinsky's research

(18), and the National Health and Nutritional Examination Survey (NHANES).

Permission to utilize the student email listserv was sought and obtained from two colleges within the university. An email was distributed via the list-servs directing students to the survey link. The body of the email contained details of the survey as well as consent of the students. A follow-up email was sent two weeks after the initial email. After 162 responses were collected, the data were exported, coded and analyzed using SPSS v.-16.0.

## Chapter 4: Results

### *Demographics*

Of the participants, 146 were female, and 16 were male. The sample was 97% Caucasian and 84% reported being single. Further description of the sample can be found in Table 1 and Table 2.

**Table 4.1: Sample Descriptives (N=162)**

Category	Minimum	Maximum	Mean	Std. Deviation
Age	17	42	21.45	4.51
Height in inches	54	77	65.77	3.49
Weight in pounds	85	280	145.47	29.48
BMI (kg/m <sup>2</sup> )	15.41	40.17	23.63	4.30
TV hours watched per week	0	100	8.46	10.75
Hours of sleep per night	1	9	6.92	1.24

**Table 4.2: University of Kentucky Classification**

Category	Frequency	percent
Freshman (1)	26	16.0
Sophomore (5)	37	22.8
Junior (6)	38	23.5
Senior (7)	48	29.6
Graduate Student (5)	13	8.0
Total	162	100

*University Meal Plan Participation*

The frequency of those who used the University’s meal plan was assessed and 120 of the respondents were using the meal plan, which accounted for 74.1% of respondents. The remaining 42 responses indicated that they did use the meal plan and accounted for 25.9% of respondents.

*Comparison of Nutrition and Non-nutrition Majors*

The table below examines several hypotheses with student t-tests. Nutrition and non-Nutrition majors were compared on BMI, exercise and weight training. There was a significant difference in BMI between non--nutrition majors and nutrition majors. This is indicated by a p--value of 0.004. However there is no significant difference found in the two groups regarding any area of exercise that was surveyed. When comparing the two groups, it was found that there was no difference in those who report exercising at least 20 minutes per day, those who exercised 30 minutes per day, those who exercised 60 minutes per day, and those who reported weight training.

**Table 4.3: BMI and exercise**

	<b>Classification</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>P Value</b>
Body Mass index (BMI)	NON NUTRITION STUDENT	138	23.9	4.5	0.004
	NUTRTION STUDENT	24	22.05	2.42	
Days a week exercised 20 min	NON NUTRITION STUDENT	136	1.54	1.06	0.374
	NUTRTION STUDENT	24	1.75	0.94	
Days a week exercised 30 min	NON NUTRITION STUDENT	136	1.3	1.08	0.312
	NUTRTION STUDENT	24	1.54	0.98	
Days a week exercised 60 min	NON NUTRITION STUDENT	137	0.82	1.02	0.819
	NUTRTION STUDENT	24	0.88	0.8	
Days a week weight training	NON NUTRITION STUDENT	137	0.72	0.847	0.093
	NUTRTION STUDENT	23	1.04	0.825	

In the below table one finds that there was no significant difference between the groups on how often students were dining out. Also there was no significant difference found when examining if students who were majoring in nutrition utilized the meal plan. Lastly there was no significant difference found between the amount of meals that were prepared in the home and if the student was majoring in nutrition or not.

**Table 4.4: Meal preparation method**

	<b>Classification</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>P Value</b>
Days a week dine out	NON NUTRITION STUDENT	138	1.14	0.77	0.68
	NUTRITION STUDENT	24	1.58	2.08	
Years of meal plan use	NON NUTRITION STUDENT	138	0.27	0.45	0.54
	NUTRITION STUDENT	24	0.21	0.42	
Days a week self-prepared meal	NON NUTRITION STUDENT	138	2.87	1.07	0.98
	NUTRITION STUDENT	24	2.88	0.99	

It was found that the amount of television watched by students was significantly different for the nutrition versus non-nutrition majors with a significance of  $p=0.005$ . The amount of hours slept per night by students was not different between the two groups, with an average of about seven hours per night for each group.

**Table 4.5: TV hours and sleep hours**

	<b>Classification</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>P Value</b>
Average hours of TV watched per week	NON NUTRITION STUDENT	138	8.86	11.49	0.005
	NUTRITION STUDENT	24	6.25	4.33	
Average hours of sleep per night	NON NUTRITION STUDENT	138	6.9	1.29	0.49
	NUTRITION STUDENT	24	7.04	0.86	

The below table examines fruit and juice consumption. It was found that there was no significant difference between consumption of juice and fruit and if the student had majored in nutrition or some other non-nutrition field.

**Table 4.6: 100% fruit juice and fruit**

	<b>Classification</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>P Value</b>
Fruit juice consumed per day	NON-NUTRITION STUDENT	138	2.24	1.27	0.12
	NUTRTION STUDENT	24	1.92	0.83	
Fruit juice consumed in past week	NON NUTRITION STUDENT	138	3.34	4.8	0.28
	NUTRTION STUDENT	24	2.25	2.99	
Average fruit juice consumed per day	NON NUTRITION STUDENT	138	0.48	0.69	0.28
	NUTRTION STUDENT	24	0.32	0.43	
How much fruit (excluding juice) consumed in past week	NON NUTRITION STUDENT	138	5.24	5.37	0.06
	NUTRTION STUDENT	24	0.88	8.39	



Non-nutrition students and nutrition students were found to be different in their consumption of vegetables. Nutrition students consumed more salad and total vegetables than non-nutrition students.

**Table 4.7: Salad, potatoes, vegetables consumed**

	<b>Classification</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>P Value</b>
Past 7 days how many times consumed green salad	NON NUTRITION STUDENT	137	2.08	0.86	0.003
	NUTRITION STUDENT	24	2.67	1.13	
Past 7 days how many times consumed potatoes	NON NUTRITION STUDENT	137	2.69	1.12	0.13
	NUTRITION STUDENT	24	3.21	1.59	
Past 7 days how many times consumed other vegetables	NON NUTRITION STUDENT	138	1.14	0.88	0.05
	NUTRITION STUDENT	24	2.15	1.69	

The two groups were not significantly different on consumption of soda and milk.

**Table 4.8: Soda and milk**

	<b>Classification</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>P Value</b>
Past 7 days amount of times full calorie soda consumed	NON NUTRITION STUDENT	138	2.17	1.41	0.26
	NUTRITION STUDENT	24	1.83	1.13	
Past 7 days how many glasses of milk consumed	NON NUTRITION STUDENT	138	2.97	1.6	0.49
	NUTRITION STUDENT	24	2.88	1.93	

The table below shows that students consumed that same number of meals per day, on average. It also shows that nutrition students were less likely to consume breakfast than non-nutrition majors.

**Table 4.9: Breakfast and meals per day**

	<b>Classification</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>P Value</b>
Days per week breakfast consumed	NON NUTRITION STUDENT	136	5.01	2.33	0.01
	NUTRITION STUDENT	24	6	1.47	
Meals consumed in one day	NON NUTRITION STUDENT	137	2.61	0.53	0.49
	NUTRITION STUDENT	24	2.88	0.44	

The below table shows the amount of calories students consume in a day. There was no significances for any of the t-tests.

**Table 4.10: Amount of calories consumed**

	<b>Classification</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>P Value</b>
Days a week do you consume less than 2000 Calories	NON NUTRITION STUDENT	129	2.97	1.3	0.58
	NUTRITION STUDENT	23	3.13	1.22	
Days a week do you consume more than 2000 Calories	NON NUTRITION STUDENT	131	2.44	1.91	0.63
	NUTRITION STUDENT	23	2.57	1.16	
Days a week do you consume more than 2500 Calories	NON NUTRITION STUDENT	131	1.65	0.93	0.48
	NUTRITION STUDENT	24	1.5	0.93	

The below t-test examines different strategies that students utilized to decrease their overall weight. There was no significant difference between the groups. It was found that for students that had majors in the nutrition department the mean was slightly higher than those who were non-nutrition students.

**Table 4.11: Weight loss practices**

	Classification	N	Mean	Std. Dev	P Value
How many times in past 30 days were fewer calories consumed to lose weight	NON NUTRITION STUDENT	136	1.38	0.49	0.44
	NUTRTION STUDENT	24	1.46	0.51	
How many times in past 30 days did you fast to lose weight	NON NUTRITION STUDENT	136	1.95	0.22	0.84
	NUTRTION STUDENT	24	1.96	0.2	
How many times in past 30 days were diet pills consumed to lose weight	NON NUTRITION STUDENT	138	1.94	0.24	0.75
	NUTRTION STUDENT	24	1.96	0.2	
Eating a variety of foods each day probably gives you all the vitamins and minerals you need.	NON NUTRITION STUDENT	134	1.97	1	0.21
	NUTRTION STUDENT	24	2.25	1.03	
Starchy foods, like bread, potatoes, and rice, make people fat	NON NUTRITION STUDENT	134	3.29	1.05	0.07
	NUTRTION STUDENT	23	3.71	0.96	

The below table contains three separate t-tests. The first t-test examines nutrition and non-nutrition student's food choices based on nutrition labels. There was no significant difference found, however the mean for non-nutrition students was slightly higher. The second t-test examined students understanding of nutrition labels and if they found them difficult to decipher. In this t-test no significant difference was found between the groups, however nutrition students had a slightly higher mean. The last t-test contained in this table examined the students' desire to maintain a healthy weight. Again no significant difference was found in this test; however, non-nutrition students had a slightly higher mean.

**Table 4.12: Nutrition fact, nutrient understand and healthy weight**

	<b>Classification</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>P Value</b>
The nutritional facts of the foods I consume affects what I eat	NON NUTRITION STUDENT	134	2.07	0.96	0.2
	NUTRTION STUDENT	24	1.79	0.93	
The nutritional information on food labels is hard to interpret	NON NUTRITION STUDENT	134	3.46	1.22	0.87
	NUTRTION STUDENT	24	3.5	1.02	
Maintaining a healthy weight is important to me	NON NUTRITION STUDENT	133	1.49	0.68	0.18
	NUTRTION STUDENT	24	1.29	0.55	

The below table contains three different t-tests. The first t-test examined student's alcohol consumption over their life-time. It was found that there was no significant difference between the groups, however the non-nutrition students mean was slightly higher than that of nutrition students. The next t-test examined the age at which a student had their first drink of alcohol. For this test no differences was found, however non-nutrition students had a slightly higher mean. The last t-test examined the students overall nutrition knowledge. Again this t-test did not show any difference however; nutrition students had a slightly higher mean.

**Table 4.13: Alcohol consumed, knowledge index score**

	<b>Classification</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>P Value</b>
During your life, how many days have you had at least one drink of alcohol?	NON NUTRITION STUDENT	135	4.6	2.07	0.76
	NUTRITION STUDENT	24	4.46	2.2	
In past 30 days, on how many days did you have at least one drink of alcohol?	NON NUTRITION STUDENT	135	2.65	1.34	0.39
	NUTRITION STUDENT	23	2.39	1.02	
Nutrition knowledge index score	NON NUTRITION STUDENT	132	2.23	0.55	0.08
	NUTRITION STUDENT	24	2.44	0.6	

The table below examines the correlations between BMI, the amount of TV hours watched, number of hours slept, how many days a week breakfast was consumed and the knowledge index score. There was no correlation between a student's BMI and the amount of hours of television a student watches per week (p-value=0.35). There was a weak negative correlation between BMI and the average hours of sleep per night. When testing the correlation between BMI and days per week breakfast was consumed it was found that the two variables were not related (p=0.93). When examining the correlation

between BMI and knowledge index score it was found that there was no association between the two variables ( $p=0.50$ ). Lastly, of the other correlation tests performed between hours slept and television is of note. The  $r$  value ( $-0.23$ ) indicates that there is there is a significant weak negative correlation ( $P$ -value  $0.004$ ).

**Table 4.14: BMI, TV hours, Sleep hours, Breakfast Knowledge**

		BMI	tv	sleep	breakfast	knowledge
BMI	R-value	1	0.08	-0.15	-0.01	-0.06
	p-value		0.35	0.05	0.93	0.5
TV hours watched per week	R-value	0.075	1	<b>-0.23</b>	-0.11	-0.04
	p-value	0.35		0.004	0.17	0.63
Average hours of sleep per night	R-value	-0.15	<b>-0.23</b>	1	0.14	0.08
	p-value	0.054	0.004		0.09	0.33
Days per week breakfast consumed	R-value	-0.01	-0.11	0.14	1	0.01
	p-value	0.93	0.17	0.09		0.9
Knowledge index score	R-value	-0.06	-0.04	0.08	0.01	1
	p-value	0.5	0.63	0.33	0.9	

## Chapter 5: Discussion

### *College Major and BMI*

The results show that the majority of students, no matter the major, had a very strong understanding of basic nutrition. In fact, both students who had chosen a major within nutrition and those who were non-nutrition major had very similar scores for the overall nutrition knowledge index. The non-nutrition students showed a mean of 2.22 and the nutrition students scoring a 2.44. This indicates that both groups had a very similar knowledge of the principles of food and nutrition. The student's responses answer

research question #1: Will nutrition majors have better nutrition knowledge and healthier BMI's than non-nutrition majors? However, it is important to note that even though the scores were very close, the students who were enrolled in a nutrition major did present with a higher score. This question was found to be null in nature because both groups showed essentially the same amount of knowledge regarding their understanding of nutrition. However, the lack of significant difference between the two groups may be explained by the number of non-nutrition students vs. nutrition students, with the amount of students who study nutrition was extremely less than those who did not. With only 24 of the 162 respondents studying nutrition related field.

### *Knowledge and BMI*

The CDC defines overweight and obesity as “ranges of weight that are greater than what is generally considered healthy for a given height” and which may “increase the likelihood of certain diseases and other health problems.”(21). Body mass index (BMI) is commonly used to determine overweight and obesity (21). The results show that on average nutrition and non-nutrition students were within a normal BMI. With BMI being based on the respondent's height and weight the average for the non-nutrition student was slightly higher, 23.9 kg/ m<sup>2</sup>, than that of the nutrition student, 22.04 kg/ m<sup>2</sup>. The student's responses answer research question #2: Will student's dietary knowledge reflect their practices as well as BMI? With both groups falling within the normal range of normal BMI this shows that the knowledge that the students possess of nutrition also reflects their BMI. Thus allowing one to make the conclusion that if one is knowledgeable about the basics of nutrition, and make health food choices then BMI and weight will reflect those healthy food choices

The nature of the survey being a self-reporting internet survey may allow for some discrepancies in reporting of height, weight, and body composition. Furthermore, more healthy and knowledgeable students may have only chosen to participate in the study, with those who have a limited understanding of BMI, and nutrition knowledge choosing to not participate in the study. One study conducted in 2006 found that some adolescence intentionally gave inaccurate information (22).

### **Chapter 6: Limitations**

Limitations of this study consisted of sample size, accuracy of the nutritional measurement tool, and survey length. Although the sample size was acceptable for achieve a representative sample only 162 students completed the survey. With the University of Kentucky's overall enrollment in 2008 exceeding 26,000 (23), the response of 162 students cannot predict the results of the entire university. Research has shown that by obtaining a larger sample size a researcher can minimize the probability of errors, maximize the accuracy of population estimates, and increase the generalizability of the results (24). By obtaining a larger number of participants it may have yielded a more significant insight into the dietary habits and knowledge of students. If the survey had not contained as many questions more students may have been inclined to participate in the survey, as well as complete the survey in its entirety. Focus groups or in class surveys may have yielded a more accurate and more participants, as there is a structured time limit in such settings.



## **Chapter 7: Conclusion and Recommendations**

The literature regarding the specifics on the dietary habits and knowledge of college age students is limited. Of the studies, almost all have found that students make healthy eating choices, and find such tools as the nutrition label a valuable tool for making those healthy choices. There does not appear to be any significant difference between the non-nutrition students and nutrition students, as both reported making healthy choices, had normal BMI's, and had a knowledge index that was not significantly different from one group to the next. It is recommended that more research be conducted and a different method of reporting be conducted such as focus groups to ensure accurate height, weight, and BMI as well as providing a more balanced number of respondents from each study group. A 24-hour recall of food may give a better and more accurate picture of the dietary habits of college age students.

## Appendix A: IRB Application

### IRB EXEMPTION CERTIFICATION REQUEST: PROCEDURES AND APPLICATION INSTRUCTIONS

Research activities in which the only involvement of human subjects will be in one or more specified categories are exempt from the federal regulations for the protection of human subjects. These categories are listed under item "16" of the attached EXEMPTION CERTIFICATION FORM. Although certain research activities are exempt, the Institutional Review Board (IRB) is responsible for certifying that the research meets the exemption criteria requirements. Once a research study has been certified as "exempt," continuation reviews are not required. **Please note if a project extends beyond a 6 year period, you are required to submit a new exemption application. Exemption applications are only held for a six year period.**

Exempting an activity from review does not absolve the investigator(s) from ensuring that the welfare of the subjects participating in the research is protected and that methods used and information provided to gain subject consent are appropriate to the activity.

Also, it is the investigator's responsibility to notify the IRB if any changes or modifications are made in the study's design, procedures, etc. which do not fall within one of the categories exempted from the regulations.

Below are instructions for preparing an IRB Exemption Certification Application:

1. The preliminary determination that a research project is eligible for exemption is made by the investigator. This judgment should be made with care. Items "15" and "16" on the attached EXEMPTION CERTIFICATION FORM serve as a guide in making this determination. Questions of interpretation may be directed to the Office of Research Integrity at 859-257-9084.
2. If the research activities fall into an exemption category, the EXEMPTION CERTIFICATION FORM, which is attached, must be completed in duplicate. **THIS FORM MUST BE TYPED.**
3. The EXEMPTION CERTIFICATION FORM should be reviewed and signed by the investigator's department chairperson. If the research is being conducted to fulfill academic requirements, the investigators faculty advisor should sign the Exemption Certification Form.
4. Note that if the research is being submitted to or is supported by an extramural or internal funding agency or program, a copy of the grant or contract proposal must also be submitted to the IRB.
5. If the research includes survey or interview procedures, the questionnaire, interview questions or assessment scales should be included in the application.

6. The study may be regulated by the Health Insurance Portability and Accountability Act (HIPAA) Privacy Rule even if the study is exempt from the federal regulations for the protection of human subjects. Please review the Office of Research Integrity's HIPAA web page, [www.research.uky.edu/ori/HIPAA/main%20page.htm](http://www.research.uky.edu/ori/HIPAA/main%20page.htm), to determine if the study is regulated by the HIPAA Privacy Rule.
7. The materials listed below should be collated in the following order and 2 copies submitted to Joe Brown, Office of Research Integrity, 405 Kinkead Hall, 0057:
  - a) Exemption Certification Form;
  - b) Instruments to be used for data collection, if applicable (see item 5 above);
  - c) When appropriate, grant/contract proposal;
  - d) HIPAA forms, if applicable.
8. The copies of the IRB Exemption Certification Form will be forwarded to the IRB chairperson or designated representative(s) for review.
9. The designated representative(s) is responsible for reviewing the exemption request. The reviewer(s) recommendations usually fall into one of three categories: a) Exemption Certification Approved; b) Additional Information Required; c) Exemption Certification Disapproved (does not qualify for exempt review).
10. If the exemption request is disapproved, the standard procedures for submitting a study for full or expedited IRB review should be followed.
11. The Office of Research Integrity will notify the investigator of the outcome of the review.

**PLEASE NOTE: IF YOUR RESEARCH INVOLVES VA PATIENTS OR VA RESOURCES, IT MUST ALSO BE APPROVED BY THE VA RESEARCH AND DEVELOPMENT COMMITTEE. PLEASE CALL THE VA RESEARCH OFFICE, 859-281-4927, FOR FURTHER INFORMATION.**

*EXEMPTION CERTIFICATION FORM*

1. Check IRB:  
 Medical \_\_\_\_\_ Nonmedical  X
2. Name and Address of Principal Investigator (PI) (where mail can most easily reach PI): If research is being submitted to or supported by an extramural funding agency such as NIH, a private foundation or a pharmaceutical/manufacturing company, the PI listed on the grant application or the drug protocol must be the same person listed below. If the PI is completing this project to meet the requirements of a University of Kentucky academic program, also list name and campus address of faculty advisor.  
 PI Name: Kelly Webber  
 \_\_\_\_\_

Department: Nutrition and Food Science

\*Room # & Bldg.: 204 Funkhouser Building

Speed Sort #: \_\_\_\_\_

\*Students should list preferred mailing address (i.e., an address where mail will most quickly reach them).

**Note: If Employee ID# is not available, provide first & last initials with year of birth e.g., JB1969**

3. PI's Employee ID#: \_\_\_\_\_ Degree and Rank: \_\_\_\_\_ Ph.D. Associate Professor \_\_\_\_\_

PI's Telephone #: \_\_\_\_\_ Dept. 81500 Code: \_\_\_\_\_

PI's e-mail address: \_\_\_\_\_ PI's FAX Number: \_\_\_\_\_

4. Title of Project: (If applicable, use the exact title listed in the grant/contract application. ***If this is a VA study, it is important that you add "UK/VA:" at the beginning of your title for internal tracking purposes.***)  
Nutrition Knowledge and Practice of University of Kentucky Students Survey

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

5. Number and age level of human subjects: 500+ / 18 years and older  
Number Age Range

6. Does the study involve recruitment of human subjects (i.e., patients, staff, volunteers) from the VA Medical

Center **OR** use VA resources (i.e., funds, equipment, space, VA personnel)?

YES \_\_\_\_\_ NO  X

If you answer “YES” to #6, you should also contact the VA Research and Development Office (859-281-4927) for additional information.

7. Indicate the items below that apply to your research. Check ALL that apply:

- Academic Degree / Required Research  
HIPAA Authorization [HIPAA Forms web address:  
<http://www.research.uky.edu/ori/forms%20HIPAA.htm>
- HIPAA Waiver of Authorization
- HIPAA De-identification
- Waiver of Informed Consent
- Waiver of Requirement for Documentation of Informed Consent
- 

8. If the research is being submitted to, supported by, or conducted in cooperation with an external or internal funding program, indicate the categories that apply. Check ALL that apply:

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Not applicable  | <input type="checkbox"/> Internal Grant Program                 |
| <input type="checkbox"/>  | <input type="checkbox"/> National Science Foundation            |
| <input type="checkbox"/> (HHS) Dept. of Health & Human Services                             | <input type="checkbox"/> Other Institutions of Higher Education |
| <input type="checkbox"/>  | <input type="checkbox"/> Pharmaceutical Company                 |
| <input type="checkbox"/> (NIH) National Institutes of Health                                | <input type="checkbox"/> Private Foundation/Association         |
| <input type="checkbox"/> (CDC) Center for Disease Control                                   | <input type="checkbox"/> State                                  |
| <input type="checkbox"/>  | <input type="checkbox"/>  |
| <input type="checkbox"/> (HRSA) Health Resources and Services Administration                |   |
| <input type="checkbox"/> (SAMHSA) Substance Abuse and Mental Health Services Administration |   |
| <input type="checkbox"/>  |   |

<input type="checkbox"/> Federal Agencies Other Than Those Listed Here	<input type="checkbox"/>	U.S. Department of Education
<input type="checkbox"/> Industry (Other than Pharmaceutical Companies)	<input type="checkbox"/>	(VA) Veteran's Affairs

9. Specify the funding source and/or cooperating organization(s): (e.g., National Cancer Institute, Ford Foundation, Eli Lilly & Company, South Western Oncology Group, etc.)

USDA, University of Connecticut

10. Attach **2** copies of the grant/contract application.

Check appropriate item:

Copies Attached: \_\_\_\_\_ Not Applicable: \_\_\_\_\_

11. Check all the applicable sites at which the research will be conducted:

<input type="checkbox"/> Not applicable	<input type="checkbox"/> Nursing Homes
<input type="checkbox"/> Bluegrass Regional Mental Health Retardation Board	<input type="checkbox"/> Other Hospitals and Med. Centers
<input type="checkbox"/> Cardinal Hill Hospital	<input type="checkbox"/> Other State/Regional School Systems
<input type="checkbox"/> Correctional Facilities	<input type="checkbox"/> Shriner's Children's Hospital
<input type="checkbox"/> Eastern State Hospital	<input type="checkbox"/> UK Classroom(s)/Lab(s)
<input type="checkbox"/> Fayette Co. School Systems	<input type="checkbox"/> UK Clinics
<input type="checkbox"/> Home Health Agencies	<input type="checkbox"/> UK Hospital
<input type="checkbox"/> Institutions of Higher Education (other than UK)	<input type="checkbox"/> (VA) Veteran's Affairs
<input type="checkbox"/> International Sites	<input checked="" type="checkbox"/> Other: <u>Internet survey</u>

12. If any of the above categories checked are off-site facilities (non-UK owned or operated; or geographically separate) at which research procedures will be initiated, provide the name(s) of the site(s) and include a letter from the institution's representative:

\_\_\_\_\_

\_\_\_\_\_

13. Disclosure of Financial Interest:

a) All investigators and employees who are or will be responsible for the design, conduct, or reporting of activities under **externally-funded** research at the University of Kentucky are required to complete a Staff/Faculty Disclosure of Financial Interest Form [<http://www.uky.edu/eForms/forms/discfin.pdf>]. Have you, or any of the specified personnel who completed a Staff/Faculty Disclosure of Financial Interest Form (Form X), answered "yes" to ANY of the 4 questions on the form?

Yes                       No                       Not externally funded

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**If “yes”**, you must include with your IRB application submission a copy of the *completed* form (Form X), **and** a copy of the significant financial interest management plan established with your Dean, Director, or through the Office of Sponsored Projects Administration (OSPA). Note: The management plan must be included or the IRB will not review your proposal.

b) If you marked in 13a) that you are **not externally funded**, complete Form Y [Staff/Faculty Disclosure of Financial Interest Form (for non-externally funded research)] and include it with your application submission.

14. Identify other study personnel assisting in research project (attach additional sheets if necessary):

**Note: If Employee ID# is not available, provide first & last initials with year of birth – e.g., JB1969**

Name, Rank/Degree	Matt Majors, Graduate Student BS	Employee ID#:	mm1984
Responsibility in Project	Study Personnel		
E-mail address:	mrmajors60@uky.edu		

15. Note: The exemption categories listed in item "16" do not apply when the research activities include the following:

- prisoners

- survey or interview techniques which include minors as subjects (this applies to exemption category #2 only)
- the observation of minors where the investigator participates in the activities being observed (this applies to exemption category #2 only)
- Food and Drug Administration (FDA) regulated research (this applies to exemption categories 1-5 and includes projects for which the data will be submitted to or held for inspection by the FDA, or projects for which the investigator gathers data on participants who serve as controls for participants who receive FDA-regulated drugs or medical devices, other than in the course of medical practice.)

16. Research activities are exempt from the federal regulation 45 CFR 46.101(b) for the protection of human subjects when the ONLY involvement of human subjects falls within one or more of the categories below. Check the appropriate categories that apply to your research project:

- (1)  Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as
- (i) research on regular and special educational instructional strategies, **or**
  - (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.
- (5)  Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless:
- (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; **and**
  - (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability; **or**
  - (iii) be damaging to the subjects' financial standing, employability, or reputation. For Veteran Affairs Medical Center (VAMC) research, damage to the subjects' insurability must also be taken into consideration.
- (6)  Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under category (5) of this section, if:
- (i) the human subjects are elected or appointed public officials or candidates for public office; **or**



- (ii) federal statute(s) require(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.
  
- (7) \_\_\_\_\_ Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. **PLEASE NOTE: According to the Office for Human Research Protections (OHRP), “to qualify for this exemption the data, documents, records, or specimens must be in existence before the project begins. The principle behind this policy is that the rights of individuals should be respected; subjects must consent to participation in research.”**
  
- (5) \_\_\_\_\_ Research and demonstration projects which are conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine:
  - (i) public benefit or service programs;
  - (ii) procedures for obtaining benefits or services under those programs
  - (iii) possible changes in or alternatives to those programs or procedures;
  - (iv) possible changes in methods or levels of payment for benefits or services under those programs;
  - (v) projects for which there is no statutory requirement for IRB review;
  - (vi) projects that do not involve significant physical invasions or intrusions upon the privacy interests of participants;
  - (vii) authorization or concurrence by funding agencies that exemption from IRB review is acceptable.
  
- (6) \_\_\_\_\_ Taste and food quality evaluation and consumer acceptance studies:
  - (i) if wholesome foods without additives are consumed **or**
  - (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the Food and Drug Administration or approved by the Environmental Protection Agency or the Food Safety and Inspection Service of the U.S. Department of Agriculture.

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## EXEMPTION CERTIFICATION RESEARCH DESCRIPTION

1. **Background:** Provide an introduction and background information.

The answers to the question, What should Americans eat? have once again been revised . There is some evidence that consumer-education campaigns have contributed to increased sales of whole-grain foods in recent years; however, consumption of all food groups has increased; including less-healthy options. Currently, although the guidelines advise that only 20% of energy come from solid fats, alcohol, and added sugars, for boys/men in the 14- to 18-years and 19- to 30-years age groups, intake of these foods constitutes 39% to 42% of total daily energy. Traditional-age college students fall in the middle of these age groups. Foods prepared away from home, including foods making up many college meal plans, have long been recognized to contain more energy and fat and less nutrients than foods prepared at home. There is some evidence that people use food-related knowledge to improve their diets, although the literature has focused primarily on food labels. There is a gap in the literature concerning whether knowledge of dietary guidelines translates into better eating behaviors, particularly among the high-risk college student age group.

2. **Objectives:** List your research objectives.

Examines if nutrition knowledge of dietary guidance actually translates into positive behavior, this cross-sectional study will investigate self-reported eating patterns of college students. An *Internet-based survey* will be used to identify how closely respondents followed the *Dietary Guidelines for Americans 2005*, and whether their eating patterns were related to their knowledge of dietary guidance. It will be observed if, for fruit, dairy, protein, and whole grains, increased knowledge is related to increased likelihood of meeting dietary guidelines.

3. **Study Population:** Describe the characteristics of the subject population, such as anticipated number, age range, gender, ethnic background and health status. Identify the criteria for inclusion and exclusion.

The estimated number of people in this study will be campus wide of all current full time students. The study population will consist of males & females, 18 years old and over, Englishspeaking.

4. **Subject Recruitment Methods:** Describe how the prospective subjects will be identified for recruitment and describe the recruitment procedures. Also, attach a copy of any material which will be used to recruit subjects (i.e. advertisements, flyers, telephone scripts, verbal recruitment scripts, cover letters, etc.).

An internet based survey will be sent out over the UK listserv system asking studetns to particiapate in the study. After a few weeks a follow up email will be sent to remind students of the survey.

5. **Research Procedures:** Describe the research procedures.

6. **Data Collection:** List the data or attach a list of the data to be collected about or from each subject (e.g. interview script, survey tool, data collection form for existing data).

Attached

7. **Potential Risks:** If applicable, describe any potential risks--physical, psychological, social, legal or other.

None

8. **Research Materials, Records and Confidentiality:** Describe procedures for maintaining the confidentiality of the data.

All instruments will be coded and names will be removed and stored in a secured locked file cabinet in the PI's office. No testing information will be given to the employer.

**Principal Investigator's Assurance Statement:**

I understand the University of Kentucky's policies concerning research involving human subjects and I agree:

1. to comply with all IRB policies, decisions, conditions, and requirements;
2. to accept responsibility for the scientific and ethical conduct of this research study;
3. to obtain prior approval from the Institutional Review Board before amending or altering the research protocol or implementing changes in the approved consent/assent form;
4. to notify the Office of Sponsored Projects Administration (OSPA) and/or the IRB (when applicable) of the development of any financial interest not already disclosed;
5. each individual listed as study personnel in this application has received the mandatory human research protections education (e.g., Dunn & Chadwick, CITI).

This is to certify that the only involvement of human subjects in this research study will be in the categories specified in item #16.

Signature \_\_\_\_\_ Date \_\_\_\_\_

\_\_\_\_Matthew Majors\_\_\_\_\_

(Name Typed)

**\*Department Chairperson's Assurance Statement:**

This is to certify that I have reviewed this research protocol and that I attest to the scientific validity and importance of this study; to the competency of the investigator(s) to conduct the project and their time available for the project; that facilities, equipment, and personnel are adequate to conduct the research; and that continued guidance will be provided as appropriate.

Signature \_\_\_\_\_ Date \_\_\_\_\_

Ann Vail\_\_\_\_\_

(Name Typed)

**\*If the Principal Investigator is also the Chairperson of the department, the Vice Chairperson or equivalent should sign the Signature Assurance Sheet.**

**\*\*Faculty Advisor's Assurance Statement:**

This is to certify that I have reviewed this research protocol and that I attest to the scientific merit of this study; to the competency of the investigator(s) to conduct the project; that facilities, equipment, and personnel are adequate to conduct the research; and that continued guidance will be provided as appropriate.

Signature \_\_\_\_\_ Date \_\_\_\_\_

Kelly Webber\_\_\_\_\_

(Name Typed)

## **Appendix B: IRB email**

Initial e-mail:

In an effort to better understand health practices of UK students, your participation in the completion of an online survey is requested.

This survey is part of a research study to determine health behaviors of UK students. The survey should take approximately 10 minutes to complete and is the only thing asked for your participation in this research. The questions are about your health status and practices.

The survey is completely anonymous and there are no foreseeable risks or benefits to you for your participation. If you have any questions concerning this study please contact Dr. Kelly Webber at 257-4351. If you have any questions about your rights as a research subject please contact the Office of Research Integrity at 859-257-9428.

Your participation is completely voluntary and you will not be penalized if you choose not to participate.

If you do choose to participate please click on the link below to complete the survey:  
XXXXXXXXXXXX

## **Appendix c: Survey Questions**

### Nutritional Knowledge and Practice Survey

Q1. What is your gender?

Q2. What is your race/ethnicity?

Q3. How old are you?

Q4. What is your height?

Q5. What is your weight?

Q6. What is your marital status?

Q7. What is your University classification?

Freshman , Sophomore, Junior, Senior , Graduate school

Q8. What is your major?

Q9. Do you belong to a campus Greek organization? If so, for how long?

Never, 1 year, 2 years, 3 years, 4 years

Q10. Do you currently use the University meal plan?

Yes, No

Q11. How many years have you used the University meal plan?

0,1,2,3,4 or more

Q12. How many meals a week do you dine on campus?

1 or less, 2-5, 6-9, 10-12, 13 or more

Q13. How often do you eat at restaurants off campus?

Never, 1-2 times a week, 3-4 times a week, 5-6 times a week, 7 times per week

Q14. How often do you cook or eat a self-prepared meal such as canned soup or cereal and milk?

Never, 1-2 times a week, 3-4 times a week, 5-6 times a week, 7 times per week

Q15. How many days a week do you exercise at least 20 minutes to the point you sweat or breathe hard: such as basketball, soccer, running, swimming laps, fast bicycling, fast dancing, or similar aerobic

Never, 1-2 times a week, 3-4 times a week, 5-6 times a week, 7 times per week

Q16. How many days a week do you exercise at least 30 minutes that make you sweat or breathe hard

Never, 1-2 times a week, 3-4 times a week, 5-6 times a week, 7 times per week

Q17. How many days a week do you exercise at least 60 minutes to the point you sweat or breathe hard

Never, 1-2 times a week, 3-4 times a week, 5-6 times a week, 7 times per week

Q18. How many days a week do you perform resistance exercises such as weight lifting, isometrics, resistance bands, or similar exercises?

Never, 1-2 times a week, 3-4 times a week, 5-6 times a week, 7 times per week

Q19. How many years have you been or were you a student athlete (excluding medical, athletic or academic red shirt years)?

Never, 1, 2, 3, 4

Q20. How many hours a week do you spend watching T.V?

Q21. On average, how many hours of sleep do you get a night?

Q22. Have you ever been diagnosed with the following conditions? (check all that apply)

Anorexia, Bulimia, High Blood pressure, High cholesterol, Diabetes

Q23. How do you describe your weight?

Very underweight, Slightly Underweight, about the right weight, Slightly overweight, Very overweight

Q24. Which of the following are you trying to do about your weight?

Lose weight, Gain weight, stay the same weight, I am not trying to do anything about my weight



Q25. During the past 30 days, did you eat less food, fewer calories, or foods low in fat to lose weight or to keep from gaining weight?

Yes, No

Q26. During the past 30 days, did you go without eating for 24 hours or more (also called fasting) to lose weight or to keep from gaining weight?

Yes, No

Q27. During the past 30 days, did you take any diet pills, powders, or liquids without a doctor's advice to lose weight or to keep from gaining weight? (Do not include meal replacement products such as Slim Fast.)

Yes, No

Q28. During the past 7 days, how many times did you drink 100% fruit juices such as orange juice, apple juice, or grape juice? (Do not count punch, Kool-Aid, sports drinks, or other fruit-flavored drinks.)

None, 1-3 past 7 days, 4-6 past 7 days, 1 per day, 2 per day, 3 per day, 4 or more per day

Q29. During the past 7 days, how many times did you eat fruit? (Do not count fruit juice.)

None, 1-3 past 7 days, 4-6 past 7 days, 1 per day, 2 per day, 3 per day, 4 or more per day

Q30. During the past 7 days, how many times did you eat green salad?

None, 1-3 past 7 days, 4-6 past 7 days, 1 per day, 2 per day, 3 per day, 4 or more per day

Q31. During the past 7 days, how many times did you eat potatoes? (Do not count french fries, fried potatoes, or potato chips.)

Q32. During the past 7 days, how many times did you eat carrots?

None, 1-3 past 7 days, 4-6 past 7 days, 1 per day, 2 per day, 3 per day, 4 or more per day

Q33. During the past 7 days, how many times did you eat other vegetables? (Do not count green salad, potatoes, or carrots.)

None, 1-3 past 7 days, 4-6 past 7 days, 1 per day, 2 per day, 3 per day, 4 or more per day

Q34. During the past 7 days, how many times did you drink a can, bottle, or glass of soda or pop, such as Coke, Pepsi, or Sprite? (Do not include diet soda or diet pop.)

None, 1-3 past 7 days, 4-6 past 7 days, 1 per day, 2 per day, 3 per day, 4 or more per day

Q35. During the past 7 days, how many glasses of milk did you drink? (Include the milk you drank in a glass or cup, from a carton, or with cereal. Count the half pint of milk served at school as equal to one glass.)

None, 1-3 past 7 days, 4-6 past 7 days, 1 per day, 2 per day, 3 per day, 4 or more per day

Q36. How many days a week do you eat breakfast?

Q37. How many meals do you consume in 1 day (including snacks)?

0-1, 2-3, 4-5, 6 or more

Q38. How many days a week do you consume 2 cups of fruit?

None, 1-2, 3-4, 5-6, 7

Q39. How many days a week do you consume 3 cups of vegetables?

None, 1-2, 3-4, 5-6, 7

Q40. How many days a week do you consume 3 cups of dairy?

None, 1-2, 3-4, 5-6, 7

Q41. How many days a week do you consume 8 oz of grains?

None, 1-2, 3-4, 5-6, 7

Q42. How many days a week do you consume 6 oz or more of meat and beans?

None, 1-2, 3-4, 5-6, 7

Q43. How many days a week do you consume 6 - 7 teaspoons of oil?

None, 1-2, 3-4, 5-6, 7

Q44. How many days a week do you consume less than 2000 Calories?

None, 1-2, 3-4, 5-6, 7

Q45. How many days a week do you consume more than 2000 Calories?

None, 1-2, 3-4, 5-6, 7

Q46. How many days a week do you consume more than 2500 Calories?

None, 1-2, 3-4, 5-6, 7

Q47. Eating a variety of foods each day probably gives you all the vitamins and minerals you need.

Strongly agree, agree, Neutral, Disagree, Strongly Disagree

Q48. Starchy foods, like bread, potatoes, and rice, make people fat.

Strongly agree, agree, Neutral, Disagree, Strongly Disagree

Q49. What you eat can make a big difference in your chance of getting diseases, like heart disease or cancer.

Strongly agree, agree, Neutral, Disagree, Strongly Disagree

Q50. The things I eat and drink now are healthy so there is no reason for me to make changes.

Strongly agree, agree, Neutral, Disagree, Strongly Disagree

Q51. Knowing the nutritional facts of the foods I consume affects what I eat.

Strongly agree, agree, Neutral, Disagree, Strongly Disagree

Q52. The nutritional information on food labels is hard to interpret.

Strongly agree, agree, Neutral, Disagree, Strongly Disagree

Q53. Maintaining a healthy weight is important to me.

Strongly agree, agree, Neutral, Disagree, Strongly Disagree

Q54. During your life, on how many days have you had at least one drink of alcohol?

0, 1-2, 3-9, 10-19, 20-39, 40-99, 100 or more

Q55. How old were you when you had your first drink of alcohol other than a few sips?

8 years, 9-10, 11-12, 13-14, 15-16, 17 or older

Q56. During the past 30 days, on how many days did you have at least one drink of alcohol?

0, 1 or 2, 3 to 5, 6 to 9, 10-19, 20-29, all 30

Q57. During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?

0, 1, 2, 3-5, 6-9, 10-19, 20 or more

Q58. During the past 30 days, how did you usually get the alcohol you drank?

I did not drink, I bought at a store, I bought at restaurant/bar/club, I bought at a public event such as concert or sporting, I gave someone else money to buy it for me, someone gave it to me, I took it from a store or family member, I got it some other way

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