

Summer 2014

Extent of BGSU Student Food Insecurity and Community Resource Use

Kathryn Koller
kkoller@bgsu.edu

Follow this and additional works at: <https://scholarworks.bgsu.edu/honorsprojects>

 Part of the [Dietetics and Clinical Nutrition Commons](#), [Economics Commons](#), [Health Communication Commons](#), and the [International and Community Nutrition Commons](#)

Repository Citation

Koller, Kathryn, "Extent of BGSU Student Food Insecurity and Community Resource Use" (2014). *Honors Projects*. 144.
<https://scholarworks.bgsu.edu/honorsprojects/144>

This work is brought to you for free and open access by the Honors College at ScholarWorks@BGSU. It has been accepted for inclusion in Honors Projects by an authorized administrator of ScholarWorks@BGSU.

EXTENT OF BGSU STUDENT FOOD INSECURITY AND COMMUNITY RESOURCE USE

KATIE KOLLER

HONORS PROJECT

Submitted to the University Honors Program at Bowling Green State University in partial
fulfillment of the requirements for graduation with

UNIVERSITY HONORS

8/7/2014

Staci Freeworth; Department of Food and Nutrition, Advisor

Mary Ellen Benedict, PhD; Department of Economics, Advisor

Kate Magsamen-Conrad, PhD; Department of Communication, Advisor

Table of Contents

Abstract.....	3
Introduction.....	3
Literature Review.....	5
Reasons for Food Insecurity.....	5
Grocery Shopping Methods.....	5
Student Finances.....	6
Reasons for Establishment of Campus Food Pantries.....	9
Rationale.....	9
Economy.....	9
Relation Between Food Prices and Wages.....	10
Food Pantry Clients.....	11
Barriers to Food Pantry Use.....	11
Food Pantries as a Short Term Solution.....	12
Methods.....	13
Study Participants.....	13
Criteria for Participation.....	13
Participant Characteristics.....	13
Study Design.....	14
Class Selection.....	14
Survey Distribution and Completion.....	15
Additional Survey Information.....	16
Survey Development.....	16
Participant Demographics.....	16
Food Insecurity and Related Topics.....	17
Theory of Planned Behavior.....	17
Information Needed to Complete Survey.....	17
Statistical Analysis.....	17
Results.....	18
Food Security Measurements.....	18
Characteristics of Food Insecure Participants.....	21
Reasons for Food Insecurity.....	22
Community Resource Awareness and Usage.....	23
Discussion.....	28
Reasons for Food Insecurity.....	29
Financial Status.....	29
Income.....	29
Employment.....	30
Student Spending Habits.....	30
Attainment of Food.....	31
Resource Usage.....	31
Limitations.....	36
Conclusion.....	40
Future Research.....	39
References.....	40
Appendix 1.....	42

Abstract

This research examines student food insecurity at Bowling Green State University (BGSU) and available resources in Bowling Green, Ohio. Seven classes from BGSU's main campus were randomly chosen to complete a survey regarding participant background information, details concerning food attainment, food security level, and use of community resources to allow for food acquisition. These classes included undergraduate classes and ranged from 15 to 272 students per class. Less than one quarter of student participants had food insecurity (19%), and food insecurity was significantly associated with financial dependence ($P=0.04$). There was a significant relationship between not utilizing community food resources and fear of embarrassment ($P=0.007$). Due to a substantial lack of statistical significance, this research cannot be generalized towards the BGSU student population. Further research should be completed to examine student food insecurity and resource use at BGSU.

Introduction

Student food insecurity seems to be an issue facing college campuses across the nation and is a concern because even though the percentage of students that have food insecurity can vary from campus to campus, national percentages of food insecurity in the U.S. seem to actually fall below college campus food insecurity percentages (1). Fifty-nine percent of the students that participated in research at a university in Oregon had some level of food insecurity (1), along with 39% of the sample in the City University of New York's study (2). However, the United States Department of Agriculture (USDA) reported that food insecurity affected 14.5% of all U.S. households in 2012 (3). Due to the higher percentages of college student food insecurity

being reported, it is important to note that this food insecurity can lead to harmful consequences, relating to academic, psychosocial, and cognitive growth (1).

Patton-López et al cited Nord and Prell when they defined household food insecurity as “the limited or uncertain availability of nutritionally adequate and safe foods, and limited or uncertain ability to acquire acceptable foods in socially acceptable ways.” (1). In addition, the USDA provides four levels of food security and insecurity (4). High food security is defined as someone who does not have any restrictions or barriers that prevent food attainment (4).

Someone that does not display alterations in their eating patterns or consumption, but may feel apprehensive about having enough food would be classified as having marginal food security (4). The next level of food security would be low food security, defined as someone that may have decreased food consumption and a poor diet (4). Finally, someone that consumes decreased amounts of food and has disturbances in their diet would be classified as having very low food security (4).

There are various programs and action steps college students can use to tackle food insecurity (1). However, food pantries were specifically examined in this research since there are several food pantries that have already been established in Bowling Green, Ohio. Food pantries do not completely stop food insecurity; thus they are only one strategy to reduce food insecurity (1). The current study, which examined student food insecurity at Bowling Green State University (BGSU) and available resources in Bowling Green, needed to be completed because even though other college campuses have studied these issues, BGSU had not at the time of this study.

Literature Review

Food insecurity and resource use at specific college campuses had been previously studied to a much greater extent than national college student research. Nevertheless, only a few studies examining specific campuses have been completed. One particular study was completed at a rural, mid-sized university in Oregon, and the main findings relate to the purpose of this current study focusing on BGSU's campus.

The study completed in Oregon examined aspects of students' lives that can affect food insecurity status (1). These factors include where the students' resided, employment during the academic year, income, sex, age, ethnicity, undergraduate and graduate status, and financial aid (1). The main results from this study were that 59% of the participants had some degree of food insecurity and 27% of the participants also used food assistance programs (1). Furthermore, 78.5% of the participants made under \$15,000 a year, and students with this level of income were the most likely to be food insecure (1). Overall, food insecurity was more frequently seen with students that used community resources, and those that were employed (1).

Reasons for Food Insecurity.

Grocery Shopping Methods. An article entitled "The Day One Leadership Program: Engaging Campus in Community Hunger Issues through Service-Learning" mentioned that high food insecurity in Mississippi was due to lack of money and access, substance abuse, and "ineffective grocery shopping methods" (5). These reasons may also apply to any community or college, including Bowling Green State University. Specifically, ineffective grocery shopping methods may be a factor at BGSU. In February of 2013 and 2014, there were several events noted on Bowling Green State University's Campus Updates email aimed to help students

become more knowledgeable about shopping for produce¹. These events were held to give students a better understanding of what is considered nutritious food. The underlying reason for ineffective grocery shopping methods at BGSU may be due to lack of knowledge and poor money management skills, or simply due to a lack of money.

Student Finances. In addition to ineffective grocery shopping methods, student finances can be another reason for student food insecurity. The US Department of Education has national data concerning undergraduate student financial aid that may influence a student's food security issue. From 2007-2008, full time and full year students who were dependent to their parents received an average of \$13,110 in aid (6), and financially independent students received an average of \$11,710 (6). Also, students who were ages 15-23 years old received an average of \$12,980 in financial aid, those that were ages 24-29 years old received an average of \$12,290 in aid, and those that were at least 30 years old received an average of \$11,350 in aid (6). Students that were married received an average of \$11,290 in aid, and those that were not married, whether single, divorced, or widowed, received an average of \$12,880 in financial aid (6). Students attending one institution and who lived in school-owned housing received an average of \$17,220 in aid, those that lived off-campus without their parents received an average of \$11,850 in aid, and those that lived with their parents received an average of \$8,570 in aid (6). With all of these determining financially-driven categories, it is hard to isolate any one given factor determining food insecurity because many students fall into several different categories.

Other research involved the City University of New York. In 2009, 39% of the students at this university did not have money to pay for nutritious meals, did not always eat meals, or did not have enough money for food and went hungry (7). The research about City University

¹ 2013, 2014 email from campusupdate@bgsu.edu to me; unreferenced

explained that less students actually went hungry (22.7%) than those who were afraid they would go hungry (45.1%) (2). The research also showed that there was a 1.6 times higher chance for students who were financially independent to have food insecurity compared with those who were financially dependent (2). In addition, students who did not work had a 35.5 % chance to be food insecure, versus 44.0% of students who worked over 20 hours a week (2). Food assistance programs, such as food pantries, were only utilized by 7.2% of the students in the study (2). These findings are surprising, given the need demonstrated by the study.

A disparity that seemed to appear between the City University and US Department of Education dealt with the classification of financial dependency. Even though students who were financially independent had a 1.6 times higher chance to experience food insecurity compared with those who were more financially dependent, the financially independent students seemed to receive less aid on average compared to those that were financially dependent.

Students from Bowling Green State University may face a similar issue. Those who are financially independent may receive less aid on average than those that are financially dependent. This population of students may already have a more difficult time when trying to afford all of their expenses during college. If these financially independent students end up receiving less aid from other sources such as working, they may be even more likely to experience food insecurity.

When considering all undergraduate students that received any scholarship or grant at BGSU, the average amount of aid awarded was \$6,219 during the 2011-2012 school year (8). On average, \$5,871 in scholarship or grant aid was awarded to first and full time undergraduate students that were pursuing a certificate or degree at BGSU during the 2011-2012 school year (8). These financial aid amounts are much lower than national averages. These lower amounts

may be especially harmful for food insecure students since extra money may be needed to pay for uncovered college costs instead of food. Furthermore, the research completed by Patton-López et al stated that financially difficult times might be worsened due to certain modifications concerning federal loan policies (1). The researcher for the current study hypothesizes that students at BGSU may face these challenges as well.

National data on Masters students were also available from the US Department of Education. For Masters students who were considered full-time and full-year at a public institution during the 2007-2008 school year, the average amount of aid received for their education up until that point was \$37,420 (9). For students that received their doctorate degree at a public school during the 2007-2008 school year, their average received aid was \$43,930 for all of their education (9). Master and doctoral students at BGSU may have received similar amounts of aid. Some of this aid might be through loans, and money going towards paying back loans could interfere with the ability to afford food.

Besides the monetary value of financial aid given out, it is also important to consider how many students receive financial aid and the circumstances behind receiving financial aid. About 75% of all undergraduates received some scholarship or grant during the 2011-2012 school year at BGSU (8). Furthermore, the article “Students get a Crash Course in Economics” stated the Department of Education reported in 2009 that 9% more federal financial aid applications were accepted (10). This same article also reported that more financial aid was given out to a larger number of students since students’ parents may no longer have jobs (10). Parental unemployment as a cause for increased aid may also apply to BGSU students. While the college costs keeps rising (10), students at Bowling Green State University, especially those who are financially independent and receiving less aid, will probably feel the effects of increased costs.

With the potential need for more financial aid due to increased college costs, college students may need help attaining food from community food pantries.

Reasons for Establishment of Campus Food Pantries.

Rationale. The consideration of the use of food pantries to help food insecure students is important, as shown by previous research. For example, academic, psychosocial, and cognitive growth can be negatively impacted by food insecurity (1). On the other hand, there have been benefits for students who face food issues and visit food pantries. According to the food pantry coordinator at Wright State University in the article “NW Ohio College Opens Food Bank,” an extended academic career can be seen with students who used food pantries when having food-related issues (11).

Economy. It is important to note that there is a direct relationship between difficult economic times and food insecurity (1). This relationship can be observed since the main reason for the creation of student food pantries cited in various articles is the economy. One article in particular, entitled “Lingering Insecurity Sends Students to Campus Food Banks,” mentioned that student hunger problems started partly due to the recession beginning in 2007 (7). Another article, entitled “USA Today’s 2010 All-USA Community College Academic Team,” mentioned that student unemployment was one reason why a food pantry was started at a community college in Oregon (12). “Financially Struggling Students Turn to Food Banks” mentioned that in 2008, a college in Seattle saw food prices rise the most in 20 years, with a 5% growth within one year (13).

The economy in general has improved in the last number of years, but students at Bowling Green State University may still need assistance with affording food due to the lingering effects of the economic downturn, or because of the continued increase in food prices.

Relation Between Food Prices and Wages. Food prices have risen in the past, and were expected to rise in 2014 (14). The USDA's Food Price Outlook reports inflation percentages and these percentages are called the Consumer Price Index (CPI) (15). In 2012, there was a 2.6% increase for the all food CPI, followed by a 1.4% increase in 2013 (14). Currently, the June 2013 inflation percentages for the all food CPI have been surpassed by 2.3% (15), and there is an expected 2.5-3.5% increase for the all food CPI in 2014 (14). However, normal food price increases may be seen as the year continues (15).

Relating to the prices of food is the amount of money spent on food. A component of food expenditures is "food at home", and the USDA defines "food at home" as food bought from grocery stores (15). When specifically looking at the amount of money spent on food at food stores, \$385,562 million were spent in 2010 and \$407,243 million were spent in 2011 (16). This price expenditure may be associated with the rise in food prices.

It is especially important to note that food prices and the amount of money spent on food have increased, since wages and incomes have not increased by the same rate. According to the U.S. Bureau of Labor Statistics, the percent change for the Employment Cost Index for wages and salaries was 0.3% between January and March of 2014, and 1.6% between March of 2013 and 2014 (17). These amounts are lower than the 2.5-3.5% expected increase in the CPI for 2014. This information concerning food prices versus wages also relates back to student finances. Students who are financially independent and potentially receiving less aid may be

food insecure. These students may be even more burdened due to lower wages and higher food prices.

Food Pantry Clients. Besides understanding why campus food pantries have been created, it is also important to understand who visits campus food pantries. There may be different underlying reasons why certain students use food pantries. Past research (7, 11, 18) has discussed the population of students that use food pantries. The article “Pantries Tackle Campus Hunger” specifically cited Oregon State University when explaining that student food pantry clients may include more than just those of the typical college age (18). Michigan State University was referenced in the article “NW Ohio College Opens Food Bank” to demonstrate that college students can be nontraditional students with families (11).

BGSU students that are not of the typical college age (18-24) may face similar issues regarding food as those from other public universities, and food pantry assistance may be of use to them. In addition, since BGSU is a public university with graduate programs, the population of students will probably vary when compared to community colleges.

Barriers to Food Pantry Use: Even if students were aware of the benefits of using food pantries when in need, there could be barriers to using food pantries. “Public versus Private Food Assistance: Barriers to Participation Differ by Age and Ethnicity” mentioned that feelings of discomfort, problems with physically taking food home, unawareness of resource location, lack of transportation, and believing the food was not needed were all reasons why people did not visit a food pantry (19). All of these reasons may influence whether or not students at BGSU use food pantries. For example, two food pantries in Bowling Green are near campus, and two are farther away from campus. Having difficulty carrying the food home or lacking

transportation are possible issues when considering whether or not to visit a food pantry in Bowling Green.

The article “Lingering Insecurity Sends Students to Campus Food Banks”, also mentioned that barriers to using food pantries might include not wanting to use resources and not knowing where to go for help. Methods to break the barrier of people not knowing about the resources could include making flyers and posting information on Facebook and Twitter. These methods were implemented at West Virginia University (7). There are a number of food pantries in the Bowling Green area and if students do not know about the current services that may be able to support them, similar methods to those at West Virginia University could be used.

Food Pantries as a Short Term Solution: Once students get around any barriers they may face when trying to use a food pantry, food pantry usage can be a short-term intervention used to tackle food insecurity. “Tennessee State University Operates a Food Bank for Students in Need”, indicates the food bank at this campus could be viewed as a resource for students that have short-term financial problems (20). When examining a need for connecting BGSU students to the current food pantries in Bowling Green, this short-term view should be kept in mind. Students who need assistance can receive help, but ultimately they may move out of the tough financial situation they are in and be able to support themselves.

Considering the past research, the researcher hypothesizes that some percentage of students attending BGSU will have food insecurity, partially caused by financial challenges. However, food insecurity may vary for a variety of student situations. Furthermore, students may face barriers to food pantry access, whether they are physical or psychological.

Methods²

Study Participants.

Criteria for Participation. The population examined for this research (via survey) included students from all active undergraduate and graduate courses in the 2014 spring semester at BGSU's main campus (n=15,709³). Exclusion criteria included students who were under the age of 18. In addition, classes not considered for the survey included those labeled as abroad and internships. Classes that involved one-on-one work with an instructor, such as directed research or practicums, were also excluded.

Courses considered abroad classes were excluded because students taking these classes may not be as concerned about resources that could help them with their potential food insecurity issues. These students may not be concerned about using resources since they are not attending school on BGSU's campus. In addition, students completing internships and practicums would not be in a class setting where the instructor can inform a large class of students about the survey.

Participant Characteristics. A total of 53 participants fully completed the survey in this study (10.8% response rate). The majority of respondents were 18-22 years old (92%), female (72%), white (77%), single/not married (96%), not employed (65%), and commuted to school (61%). Almost half (48%) made under \$10,000 a year. This amount could include income from parents, guardians, or others that help the student if the student has some level of financial dependence. Of those who were employed, 12% worked up to 10 hours per week, 14%

² This project was approved by the Institutional Review Board (IRB) before any research was completed.

³ 2014 phone conversation from MS Petrea to me; unreferenced

worked up to 20 hours per week, and 8% worked up to 30 hours per week. The main characteristics of student participants can be found in Table 1.

Table 1. Main Characteristics of Student Participants.

Characteristic	n (%)
18-22 years old	49 (92)
Female	38 (72)
White	41 (77)
Single/Not Married	51 (96)
Not Employed	32 (65)
Commute to School	31 (61)
Income	24 (48)

Study Design.

Class Selection. All classes from BGSU’s main campus that were active during the spring semester of 2014 were split into seven groups based on student enrollment. The specific student enrollment ranges that formed groups are as follows: 1-29, 30-49, 50-99, 100-149, 150-199, 200-249, and 250 students and above. Once the classes were placed into one of the seven groups, five classes from each group were randomly chosen through an Excel spreadsheet randomizer⁴.

⁴ In order for classes to be randomly chosen, a new column was created next to the class names in an Excel spreadsheet. Random numbers generated by Excel were placed next to each class in the new column, and the classes were sorted into a new order according to the numbers. After the new order was determined, the first five classes for each class range were chosen (21).

Once five classes from each group were chosen, the five classes from the seven groups were combined to form three new groups. Once these new groups formed, various classes were randomly chosen from these groups. Generally speaking, more classes were chosen from the new groups that contained smaller-sized classes so the smaller classes would have a higher chance for being chosen as the classes to take the survey. It was important to give the smaller-sized classes a higher chance of being chosen since the smaller-sized classes could contain students that are farther along in their coursework when compared to students in larger-sized classes. Resultantly, this may lead to participants with a more diverse and representative background.

Specifically, the 10 classes from the 1-29 and 30-49 groups were combined into one group. Four classes were then randomly chosen from this new group. The 10 classes from the 50-99 and 100-149 groups were also combined, and two classes were randomly chosen from this new group. In addition, the 15 classes that made up the 150-199, 200-249, and 250 and above groups were combined, and only one class was randomly chosen. A 95% confidence interval was used in this study along with a 5% margin of error. From these percentages, 375 participants were suggested for the sample size (22).

Survey Distribution and Completion. After these seven classes were chosen, the class instructors received emails about the opportunity for their students to take an online survey concerning student food insecurity and available resources in Bowling Green, OH. Four of the original seven classes took part in the survey. Three of the original seven classes declined for various reasons. Three additional classes were randomly sampled from the combined groups of classes containing 1-49 students, 50-149 students, and at least 150 students. The final seven classes were all undergraduate classes, as chosen by the Excel program. After the participating

classes were finalized, the class instructors were emailed the survey link. They were asked to distribute this link to their students, and were given the option of having the survey explained to their class. Once the survey was distributed to the students, participants read through an online consent form, gave consent, and completed the online survey. By giving consent and participating in the survey, participants indicated they were at least 18 years of age.

Additional Survey Information. Students were informed before taking the survey that they would have a one in five chance of winning a gift card to a designated dining location on BGSU's main campus if they completed the survey within the first month it was offered. The first drawing was held after the survey was open for two weeks. Twenty students who participated in the survey were randomly drawn and won a gift card to a dining location on campus. The second drawing took place two weeks later. To make sure participants' identifiable information was kept confidential when obtaining the gift cards, a unique code was emailed out to each gift card winner. They then presented their code to a designated office on campus to receive the gift card.

Survey Development. Student participants completed a 29-question online survey that was created on Qualtrics, an online survey program (Appendix 1). The last survey question included 12 items, and each item needed to be rated on a Likert scale from one (completely agree) to seven (completely disagree). Various factors were examined in this study, relating to both the general sample and the food insecure participants.

Participant Demographics. Various demographic factors were measured in the surveyed. These factors were included to establish the background of the general sample, and since previous student food insecurity research had examined these factors (2, 11, 18). These factors included race, income, and whether or not students were financially independent.

Food Insecurity and Related Topics. Food insecurity was measured from the United States Department of Agriculture's (USDA's) definitions, as previously defined in the introduction section (4). Survey questions also asked participants about other topics that may relate to food insecurity. These topics included food attainment and use of community resources to allow for food acquisition, and the topics related to past research (5, 19).

Theory of Planned Behavior. As previously mentioned, participants were asked to rate 12 items on a Likert scale. These items were modeled from the Theory of Planned Behavior. This theory states that an intention and potential behavior can result from beliefs dealing with behaviors, control, and norms (23). The components of this theory that were measured in the survey included perceived norms, opinions about a behavior, command over a behavior, and past behavior (23).

Information Needed to Complete Survey. Before taking the survey, participants were given information to read over to clarify terms they would see later in the survey. This information included the definition of the word "you." "You" in this survey referred to the participant and others such as parents and guardians that paid for the participant's expenses. This definition of "you" was used when determining income level. In addition, a non-traditional student was defined as a student who is coming to college after a military career or time spent raising a family, or who is ready to get a college degree five or more years after graduating from high school⁵ (24-25). Finally, participants were provided with the United States Department of Agriculture's (USDA's) definitions for the different types of food security and insecurity (4).

Statistical Analysis. The Center of Business Analytics in the College of Business at BGSU analyzed the data from this survey. Means and standard deviation (SD) were estimated for the

⁵ 2014 phone conversation with EJ Buetikofer to me; unreferenced

questions that had numbered answer responses. Frequency distributions were developed for every question. Contingency tables were used to compare demographic characteristics of the participants with answers from food insecurity and other questions. When analyzing contingency tables, Chi-square measurements were used to determine statistical significance of differences when $p < 0.05$. Due to missing data, Fisher's exact test was used instead of the Chi-square test. Again, the level of statistical significance employed was 0.05%.

Results

Food Security Measurements. Descriptive statistics were used to assess student food insecurity at BGSU (Figure 1). Among the sample examined in this study, 81% indicated they had food security ($n=35$). Nineteen percent described their food security as low or very low ($n=8$). Low food security and very low food security used to be referred to as food insecurity without hunger and food insecurity with hunger, respectively. Therefore, participants who indicated they had either low or very low food security were considered food insecure.

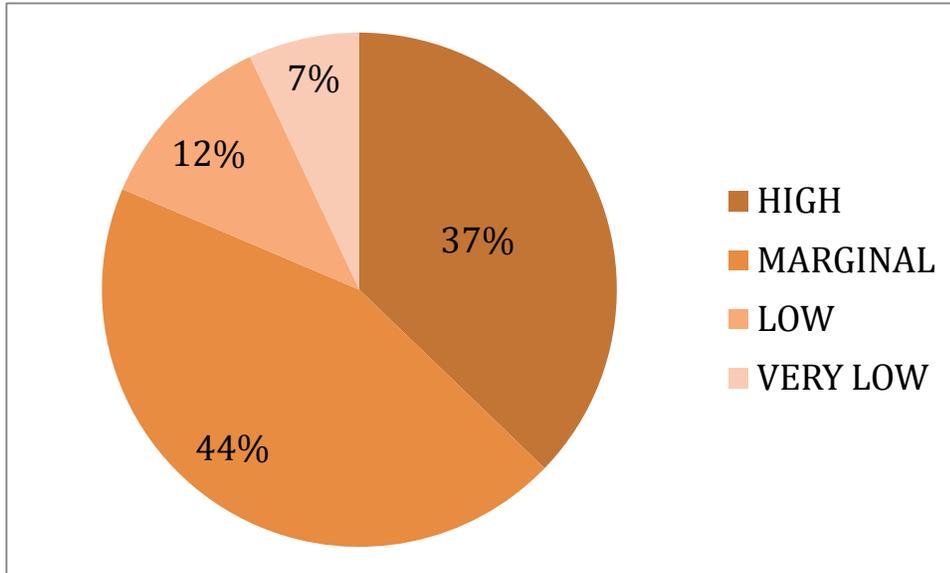


Figure 1. Participant Food Security Levels.

When examining the food insecurity and security in depth, there were some important characteristics to consider. Overall, 46% (n=20) of the participants indicated they were 100% confident they could afford their next meal (Figure 2). Thirty-five percent (n=15) indicated they were 51-98% confident they could afford their next meal. Nineteen percent (n=8) indicated they were no more than 50% confident they could afford their next meal.

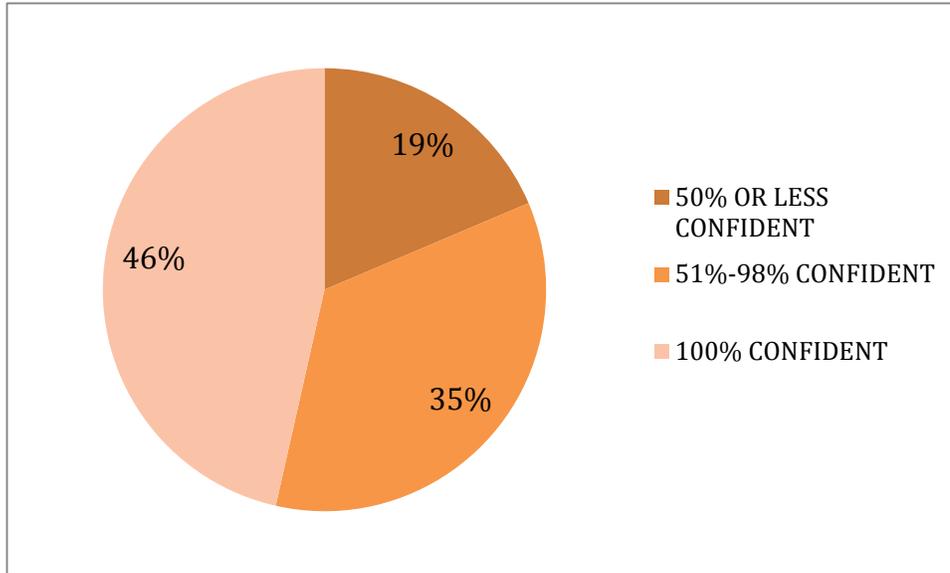


Figure 2. Participants' Confidence Level of Affording Next Meal.

Additionally, the majority of participants (n=32; 73%) reported they were able to afford the food they needed on average per month (Figure 3). Eighty-nine percent (n=39) reported they were unable to afford food up to three times per month. Furthermore, 11% (n=5) reported they were unable to afford food they needed four or more times in a month. "Food you need" was defined in the survey as "food/beverages that are needed to live a healthy and nourishing life. Fruit, vegetables, and water are examples. Alcohol, expensive coffee drinks, and high-priced restaurants would not be included." Similarly to what was previously mentioned, 70% (n=31) of the participants reported they did not skip meals because they could not afford the meals. Only 25% (n=11) of the participants indicated they skipped a meal two or more times per month because they could not afford the meal.

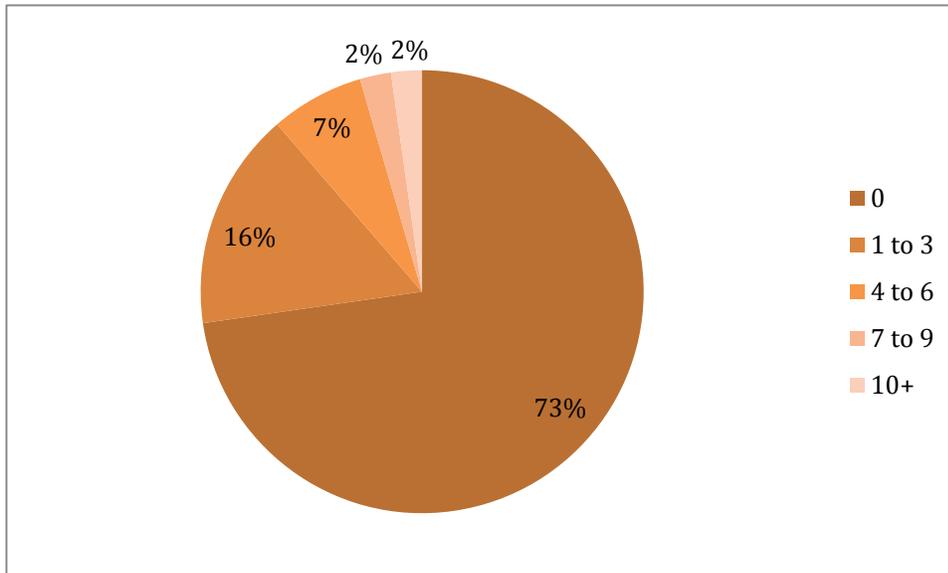


Figure 3. Number of Times in a Month Participants Could Not Afford Food.

Characteristics of Food Insecure Participants. The majority of the food insecure participants indicated they were 18 to 22 years old ($n=7$; 87.5%; $P=0.778$), female ($n=5$; 62.5%; $P=0.739$), white ($n=6$; 75%; $P=0.612$), single ($n=7$; 87.5%), and not employed ($n=6$; 75%; $P=0.277$). Half of these participants commuted to school ($n=4$; $P=0.051$) and made below \$10,000 a year ($n=4$; $P=0.697$). In addition, 62.5% of the food insecure students identified more with having financial dependence ($n=5$; $P=0.04$). For the most part, these characteristics aligned with the overall population sampled in this study. The only exception dealt with the amount of commuter students. A higher percentage of food insecure participants commuted (50%) when compared to the general sample (39%). In general, these demographic factors did not have a significant association with food insecure participants (Table 2). The only significant association was seen with food insecurity and financial dependence.

Table 2. Analysis of Food Insecure Student Sample Characteristics.

Characteristics	n (%)	P-value ^a
18-22 years old	7 (87.5)	0.778
Female	5 (62.5)	0.739
White	6 (75)	0.612
Single	7 (87.5)	
Not Employed	6 (75)	0.277
Commute	4 (50)	0.051
Income <\$10,000/yr	4 (50)	0.697
Financial dependency	5 (62.5)	0.04

a. When p is ≤ 0.05

Reasons for Food Insecurity. This study also examined why students at BGSU may be food insecure (Table 3). Thirty-seven and one half percent ($n=3$; $P=0.133$) of the food insecure participants indicated that one of the reasons they may not be able to afford the food they need is due to lack of employment.

Twenty-five percent ($n=2$; $P=1.000$) indicated that one of the reasons for food insecurity is due to poor money management skills. One participant (12.5%; $P=0.083$) indicated that one of the reasons for food insecurity is due to the family's poor money management skills. This participant had previously indicated the family was completely financially dependent.

When participants were asked to indicate what all they would spend an extra \$100 on in a week, food was selected most often (55%) and apparel was rated second (30%). When specifically looking at food insecure students, food was selected most often (62.5%). Another

question on the survey asked participants to rank various food establishments in regards to which they attained food from the most and least often. 37.5% of the food insecure participants reported that grocery stores were the food establishments they used most often to attain food. Furthermore, 50% of the food insecure participants mentioned that food pantries were one of the least often methods of food attainment.

Table 3. Possible Reasons for Student Food Insecurity.

Reason	n (%)	P-value ^a
Lack of Employment	3 (37.5)	0.133
Poor Money Management	2 (25)	1.000
Skills		
Family's Poor Money	1 (12.5)	0.083
Management Skills		

a. When p is ≤ 0.05

Community Resource Awareness and Usage. When food insecure participants were asked if they were currently using resources in Bowling Green to help with their food insecurity, three participants (37.5%; $P=0.812$) indicated they were not aware that the resources existed, while two participants chose not to use the resources (25%; $P=0.812$) and one did not respond (12.5%; $P=0.812$). Furthermore, two participants indicated that they did not use the resources and felt they had food security (25%; $P=0.812$). Around one-third of the food insecure participants ($n=3$;

37.5%) indicated that they did visit a resource up to three times per month, although it is not clear if these visits were actually in Bowling Green.

The same participants who reported that they visit a resource up to three times a month also indicated they do not feel comfortable using these resources. The participants were asked to check all of the answer choices that applied to their situation. In total, there was one indication of embarrassment, two indications of difficulty with transportation, and one indication of “other” that was not specified.

The researcher also inquired about the reasons why students did not take advantage of the resources available for food insecurity (Table 4). Overall, food insecure participants indicated that they were embarrassed (n=3; 37.5%; P=0.007), they did not know where the resources were located (n=3; 37.5%; P=0.108), and they did not think they were eligible to use the resources (n=3; 37.5%; P=0.402). One participant (12.5%; P= 0.474) indicated that “my mother would not allow it”.

Table 4. Analysis of Reasons for not Using Community Resources.

Reason	n (%)	P-value ^a
Embarrassed	3 (37.5)	0.007
Did not Know Location	3 (37.5)	0.108
Believed they Were Ineligible	3 (37.5)	0.402
Not Allowed by Mother	1 (12.5)	0.474

a. When p is ≤ 0.05

Participants were also asked a series of questions modeled from the theory of planned behavior (Table 5 and Table 6). Overall, there were no statistically significant relationships between food insecurity and the responses to the questions. When participants read the statement “food pantries are a good idea”, the mean rating was 2.3 on a one (completely agree) to seven (completely disagree) scale. Specifically, 80% of the participants reported some level of agreement with this statement. Seventeen and one half percent neither agreed nor disagreed, and 2.5% indicated some level of disagreement. Those that were food insecure all reported some level of agreement for the same statement (Agree: $n=6$; $P=0.658$).

When participants read the statement “it would be okay if I had to use a food pantry”, the overall mean was 3.5, showing that participants “somewhat agreed” with this statement. The number of participants that agreed with this statement dropped to 46%, the number of students that neither agreed nor disagreed rose to 31%, and the number that disagreed rose to 23%. Food insecure participants still reported a higher amount of agreement with this statement when compared to the total sample of participants (Agree: $n=4$; 66.7%; $P=0.917$), so the reporting of both the overall sample and food insecure participants were somewhat misleading.

A somewhat similar pattern can be seen with another set of questions. When students read the statement “most people who are important to me approve of food pantries,” the overall mean was 3.18. Specifically, 46% of the participants reported some level of agreement with the statement. 46% also reported neither agreeing nor disagreeing with the statement and 8% reported some level of disagreement. Fifty percent of the food insecure participants indicated they had some level of agreement with this statement ($n=3$; $P=0.492$), which is similar to what the overall sample reported. It is important to note that a statistically significant association was not observed.

As similarly seen before, when participants read the statement “most people who are important to me would approve of my use of food pantries,” the mean rose to 3.73. The amount of participants that agreed with this statement dropped to 38%, the amount that neither agreed nor disagreed with this statement dropped to around 38%, and the amount that disagreed rose to 27%. However, these results are inconsistent with the responses of the food insecure students ($P=0.089$). The food insecure responses are also not statistically significant.

Additional information that may explain why food insecure participants may not be using resources to help with food insecurity may be due to their belief about food pantry usage. When participants read the statement “ food insecure students at Bowling Green State University have visited a food pantry in the last 3 months,” (changed on own) the overall mean was 3.7. Twenty four and one half percent of all participants agreed with this statement, 62% neither agreed nor disagreed, and 13.5% disagreed. However, 50% ($n=3$; $P=0.464$) of the food insecure participants agreed with this statement, and 50% ($n=3$; $P=0.464$) neither agreed nor disagreed with this statement. Nevertheless, the relationship between food insecure students and their responses lacked statistical significance.

When participants read the statement “ I intend to visit a food pantry within the next three months,” the overall mean dropped to 5.6. Overall, 10.5% of the participants agreed, 23.5% neither agreed nor disagreed, and 66% disagreed. When food insecure participants read the statement, 33% agreed ($n=2$; $P=0.228$) and 50% ($n=3$; $P=0.228$) disagreed. Again, the association between food insecure students and their responses was not statistically significant. Furthermore, beliefs about an individual’s ability to get food were also important. When all participants read “my ability to get food is entirely up to me,” the overall mean was 2.9. Overall, 57.5% agreed, 25% neither agreed nor disagreed, and 17.5% disagreed. Food insecure

participants had very similar beliefs (Agree n=3; 50%; Neutral n=2; 33.3%; Disagree n=1; 16.7%; P=0.936).

Table 5. Descriptive Statistics of Participant Responses to Theory of Planned Behavior Statements.

Statement	Total (n)	Mean; SD ^a
Food pantries are a good idea.	40	2.3; 1.36
It would be okay if I had to use a food pantry.	39	3.5; 1.87
Most people who are important to me approve of food pantries.	39	3.18; 1.44
Most people who are important to me would approve of my use of food pantries.	37	3.73; 1.59
Food insecure students at Bowling Green State University have visited a food pantry in the last 3 months.	37	3.7; 1.37
I intend to visit a food pantry within the next three months.	38	5.6; 1.76
My ability to get food is entirely up to me.	40	2.9; 1.74

a. 1=Completely agree, 7=completely disagree

Table 6. Analysis of Theory of Planned Behavior Statements from Food Insecure Participants.

Statement	Agree: n(%)	P-value ^a
Food pantries are a good idea.	6(100)	0.658
It would be okay if I had to use a food pantry.	4(66.7)	0.917
Most people who are important to me approve of food pantries.	3(50)	0.492
Most people who are important to me would approve of my use of food pantries.	3(50)	0.089
Food insecure students at Bowling Green State University have visited a food pantry in the last 3 months.	3(50)	0.464
I intend to visit a food pantry within the next three months.	2(33)	0.228
My ability to get food is entirely up to me.	3(50)	0.936

a. When p is < 0.05

Discussion

This research examined student food insecurity at Bowling Green State University's main campus, and resource use in Bowling Green, Ohio. In general, the characteristics of participants from both the current research and research completed at a university in Oregon were somewhat similar. In the Oregon university study, 72% of the participants were between 18 and 24 years old, 73% indicated they were females, 71% lived off campus, and 73% reported they were single (1). The majority of the participants in the current study had these same characteristics.

One of the main findings from the current research is that 19% of the participants indicated they had some level of food insecurity. This percentage is notably smaller than the percentages seen in previous research, such as 39% of the students attending the City University of New York (2) and 59% of the student participants who went to a university in Oregon (1).

The researcher hypothesized that there would be some percentage of students that have food insecurity, but due to a small sample size in the current study, a larger study of BGSU students may produce a larger number of food insecure students with a different percentage of students. The researcher also hypothesized that the type of food insecurity may differ for students due to their different backgrounds. A more accurate description of BGSU student food insecurity may be presented with a different number of students.

Reasons for Food Insecurity.

Financial Status. When specifically examining the food insecure students' demographics in this study, a significant association was only observed between food insecurity and financial dependence ($P=0.04$). Specifically, 62.5% of the food insecure students were financially dependent. However, a previous study reported that food insecurity was seen more often with students who were financially independent (2). This previous study did not describe any statistical analyses in the report, so more research is needed to examine associations between food insecurity and student financial status. As previously mentioned in the literature review, student finances are especially important to examine since student finances may be a reason for food insecurity. The researcher also hypothesized that student finances may be one cause for food insecurity at BGSU.

Income. Another main finding concerning student finances and that may also relate to the reasoning behind student food insecurity at BGSU is income. Overall, students may not have enough money since half of the food insecure participants made under \$10,000 a year. Even though participants did not indicate they had a low paying job when they were asked "What do you believe is keeping you from affording the food that you need?," these current findings may

indicate that lack of money is a reason for food insecurity. A previous study also found a significant association between student food insecurity and income that was below \$15,000 a year (1). However, the current study's relationship between food insecurity and income at BGSU was not statistically significant ($P=0.697$). Due to the lack of statistical significance, further research should be completed to assess the association between these two variables.

Employment. Thirty-seven and one half percent of the food insecure participants also indicated that one of the reasons they may not be able to afford the food they need is due to lack of employment. Overall, 75% of all of the food insecure participants said that they were not employed, and this was somewhat similar to 65% of all survey participants who were not employed. However, the finding from the current study concerning food insecurity and unemployment was not statistically significant ($P= 0.133$) and previous research has reported there is an inverse relationship between employment during college and food insecurity. Research completed at an Australian university reported that student food insecurity was related to employment (26). In addition, the research completed at the Oregon university found that there was a significant association between food insecurity and employment (1).

Student Spending Habits. In addition, the participants were asked to select what they would want to spend an extra \$100 on in a week. This question was used to gauge participants' priorities in regards to budget, and this could lead to a possible reason for BGSU student food insecurity. Food was selected most often for all of the participants and those that indicated they were food insecure. However, previous research has stated that college students may spend their money on other aspects of their budget, such as utilities and college-associated costs, instead of food when they are having financial problems (1). This disconnect in research findings may be a result from a smaller research sample in the current study. Due to the smaller sample size, along

with the lack of statistical significance, more research needs to be completed concerning college student spending habits, especially when students have a difficult financial situation. If statistically significant data is reported in additional research completed at BGSU, a better understanding of the reasons for food insecurity and the percentage of students with food insecurity will be developed.

Attainment of Food. Another question on the survey asked participants to rank various food establishments in regards to which they attained food from the most and least often. This could allow for more of an understanding concerning what sort of food the food insecure participants were obtaining, and how this could relate to food insecurity.

Thirty-seven and one half percent of the food insecure participants reported that grocery stores were the food establishments they used most often to attain food. Fifty percent of the same participants stated that food pantries were one of the least often methods of food attainment. As stated earlier, half of the food insecure students made under \$10,000 a year. In addition to not making enough money, food insecure participants may not be using resources as much as they need. Therefore, this would seem to be a tiered system in helping explain food insecurity. Students who feel compelled to use grocery stores instead of available resources may not have adequate grocery shopping skills, as explained in the literature review (5). In general, food-related issues would be even more troublesome. Nevertheless, a better understanding of all circumstances behind student insecurity at BGSU may be developed once statistically significant results are obtained.

Resource Usage. Additional main findings also relate to community resource usage. Two participants did not use community resources while three students reported that they did not

know there were resources available in Bowling Green. In addition, two food insecure participants indicated they felt they had food security.

However, 37.5% of food insecure participants reported they visited a resource up to three times a month. Even though the findings from the current study were not statistically significant, the percentage of food insecure participants that used resources aligns more with a past study. The research completed by the Oregon university reported that 27% of the participants used community resources (1). The current research was more focused on food pantry usage, but the university from Oregon included other food assistance programs in their study (1). These programs included the Supplemental Nutrition Assistance Program (SNAP) and Women, Infants, and Children (WIC) (1). Yet, another past study reported that community food banks were only used by 2.3% of the participants, and that university resources were only utilized by 3.8% of the participants (26). According to the research cited in this paper, college food insecure students are probably not utilizing community resources as much as they could be, thus worsening their situation. More research concerning BGSU student resource use should be completed due to the lack of statistical insignificance and because participants may have indicated resource use outside of Bowling Green.

As mentioned earlier, food insecure students that did not use a resource were asked why they did not use resources. The only statistically significant relationship was observed between food insecurity and embarrassment ($P= 0.007$). This may indicate there is a stigma attached to food insecurity and resource usage at BGSU, and more work needs to be completed to minimize and remove the stigma. Other barriers mentioned in the literature review, such as lack of transportation (19), were not significant. The researcher previously hypothesized that students

could face barriers to food pantries. BGSU food insecure students may face more psychological barriers rather than physical barriers.

Food insecure participants also indicated that they did not know where the resources were located and they did not think they were eligible to use the resources. These responses may indicate that education and awareness of the resources need to be developed. A previous study completed in Australia also suggests the need for increased education and awareness concerning resource availability and location. Awareness of community food banks was only indicated by 6.6% of the study's participants, and awareness of university resources was indicated by 10% of the students (26). It is important to note that societal norms may also explain why food insecure participants did not use resources at BGSU. One participant said that "my mother would not allow it". This indicates that some families in this country negatively view the use of food pantries. Since the only statistical significant association was seen with embarrassment, more research about other reasons why food insecure participants do not use resources in Bowling Green State.

Beyond what students have already indicated concerning why they may not use the resources in Bowling Green, various beliefs can describe the students' intention to use a resource (23). Certain information obtained from the participants may explain the reasoning behind why food insecure participants do not plan on using resources, especially in Bowling Green. Overall, these beliefs are part of the theory of planned behavior (23).

As previously reported, 80% of all participants and 100% of food insecure participants agreed with the statement "food pantries are a good idea." This may suggest that students are in favor of food pantries, but only 46% of all participants and 66.7% of food insecure participants agreed with the statement "it would be okay if I had to use a food pantry." More research needs

to be conducted to determine if there are statistically significant associations describing how participants responded to the previous two statements. More research also needs to be completed in regards to the discrepancies observed between the responses to the two previous statements, which may be explained by the optimistic bias.

Optimistic bias can be defined as the belief that unfavorable incidences are more likely to happen to someone else (27). In general, someone's inclination to alter any unsafe conduct can be prevented by this bias (27). It is important to note that peer-accepted activities are more appealing to college students, and this allows them to be impacted by the optimistic bias (27). Less participants may have agreed with the statement "it would be okay if I had to use a food pantry," since the behavior of using a food pantry may not be accepted by their peers. Optimistic bias may also explain a previous finding, specifically that students may have been embarrassed to use food pantries. This embarrassment may be due to the stigma created by their peers.

Optimistic bias may still present in more of the participants' responses. When participants read the statement "most people who are important to me approve of food pantries," 46% of all participants agreed with this statement. However, when participants read the statement "most people who are important to me would approve of my use of food pantries," only 38% of all participants agreed with this statement. Again, this suggests that the act of using a food pantry would seem less acceptable by the participants' peers.

Optimistic bias may also relate to intention to use a food pantry. Specifically, 24.5% of all participants and 50% of food insecure students agreed with the statement "food insecure students at Bowling Green State University have visited a food pantry in the last 3 months." However, 10.5% of all participants and 33% of food insecure participants agreed with the statement "I intend to visit a food pantry within the next three months." Food insecure

participants in Bowling Green may not be receiving enough help from community resources due to the attached stigma and norms held by their peers. However, more research needs to be performed to make a more definite conclusion since there were statistically insignificant relationships between food insecure students and their responses to the two previous statements.

Furthermore, beliefs about an individual's ability to get food were also previously mentioned. When participants read the statement "my ability to get food is entirely up to me," 57.5% of all participants agreed, and food insecure participants held very similar beliefs. These responses may explain why only 50% of food insecure participants indicated that they intend to visit a food pantry within the next three months. Some food insecure participants may be indicating that they do not want help from food pantries to attain food.

However, participants could also be indicating that they consider themselves solely responsible to find food pantries and other resources. If food insecure individuals do not reach out for help when trying to find resources, they may face various barriers. One barrier previously mentioned was that participants did not know where the resources were located. This hindrance and other barriers can lead to less food insecure individuals visiting food pantries and receiving the food they need. Once again, it is important to note that any associations reported between food insecure students and their response to the previous statement lack significance.

Overall, it seems that food insecure students at BGSU may not be receiving as much assistance as they could due to decisions being affected by embarrassment attached to the use of community resources. Most of the analyses completed in this study were not statistically significant. Other more specific research needs to be completed in order to describe the characteristics of food insecure students at BGSU, the causes of food insecurity, the number of

food insecure students aware of and using food pantries, and reasons why food insecure students may not use resources.

Limitations. This research has many limitations. Firstly, data collection was through self-reporting, which may lead to not entirely accurate results. Secondly, the current study yielded a low response rate (10.8%). Even though previous research has also produced low response rates, such as the 7% response rate at an Oregon college (1) and the 15.7% response rate at the City University of New York (2), the amount of participants differed considerably from the amount of participants in this study. The Oregon university study included 354 participants (1), and the City University of New York had 1,086 participants (2), whereas the current study had only 53 completed surveys. There were five partially completed surveys in this study, but these were not included in the data analysis since their use would have produced a less accurate analysis.

This small sample size contributed to the low amount of statistically significant data in this study. Resultantly, there was not enough power to generalize the results from this study to BGSU students. There may have been a low response rate, and a small number of students indicating they are food insecure in this study's survey due to the stigma associated with being food insecure and using community resources.

Besides the presence of a small sample size, another reason why the percentage of food insecure students may have been relatively small in this study could be due to confusion with the provided terminology. Participants may not have read the definitions for the terms given in the survey, and there were differences between the old and new terminology. All current terms included the word "security," and this may have confused participants since some questions asked about food insecurity.

Furthermore, the sample was not fully representative of the students attending BGSU's main campus. Three of the seven classes (42.8%) that took part in this survey were from the College of Musical Arts. However, the College of Musical Arts contains the least amount of students (2.7%) (28) when compared to the other colleges at BGSU. Resultantly, the sample does not fully represent BGSU in regards to major. However, the majority of undergraduate students at BGSU's main campus are 18-21 years old (29), female (30), white (31), and live off campus (32). The majority of participants in the current study also had these characteristics. It is important to note, though, that there was a 16% difference between the actual percentage of females and 18-21 year olds attending BGSU when compared to the percentages from the study. A disproportionate amount of females was also seen in a previous study about college student food insecurity (1).

One main finding, and limitation, from the current research is that there seemed to be an inconsistency between certain data. For example, even though 46.5% of the participants indicated they were 100% confident they could afford their next meal, only 37% indicated they had high food security. It would make more sense if the two percentages were closer together, since high food security is defined as having "no reported indications of food-access problems or limitations" (4). Similarly, 44% of the participants reported they had marginal food security, but only 35% of the participants said that they were somewhere between 51 and 98% confident they could afford their next meal.

Furthermore, even though 81% of the participants indicated they had some level of food security, only 70% of the participants said they do not skip meals due to not being able to afford the meals. Again, it would make more sense for these percentages to be closer in value. This is important to note because marginal food security is "typically anxiety over food sufficiency or

shortage of food in the house. [There is] little or no indication of changes in diets or food intake,” (4). These inconsistencies are important to note since they may produce a less accurate analysis by not fully representing the participants taking the survey.

Another inconsistency is that participants answered two similar questions differently. When participants were asked what they thought kept them from affording food they need in one question, 57% reported they can afford the food they need. However, when asked “how many times a month are you unable to afford the food you need?,” 73% of the participants indicated they were able to afford the food they needed. Again, this inconsistency may not fully represent the participants taking the survey.

In addition, the survey did not explicitly ask about participants’ food insecurity and resource use for certain time periods of their lives. It would be important to know about participants’ lives at different ages and when comparing school and home life, since food insecurity and its effects may look differently throughout someone’s life. For example, food insecurity is probable if someone has lived in a low-income family throughout their life (1). However, more immediate help would probably be available for students that have been part of the middle-class, along with the period of food insecurity being brief (1).

The possibility that participants may have differences between their home and school life may also explain why participants included information about resources that are not in Bowling Green. They may use resources when at home, but their home may not be in Bowling Green. However, no participant indicated where he or she uses resources, so no conclusions can be drawn about the location of used resources.

Another limitation deals with the type of institution used for this research. Research about food insecurity and resource use of BGSU students had not been published at the time of

this research, and this was the main reason for the current research. However, those attending a public university, such as BGSU, may have more access to educational funding when compared to students attending community colleges. Besides a smaller sample size in this study, the type of institution and resultant increased funding may have also contributed to the low amount of food insecure participants in this study.

In addition, the current research included most students in the sampling frame. However, more information about certain populations, such as international and graduate students, could have been obtained if only these certain populations were studied.

Another limitation is that participants were never explicitly asked “Where is the food pantry?.” Participants may have indicated they use a resource to help them with their food insecurity, but when specifically asked to name the resource, they may not actually know where a resource is located. Participants’ possible lack of understanding and awareness of community resources could lead to inaccurate results.

When participants were asked what they would spend money on in a week if they had an extra \$100, they had to check all of the responses that applied, which might have led to results being somewhat vague. It would have been more beneficial if participants were asked to choose only one option since this would require participants to make a definite decision in regards to their spending priorities. One other possibility may have dealt with participants ranking the answer choices in a ranking based on preference to give a more accurate response.

Conclusion. Overall, this current research project has been a learning experience. Most of the findings from the research were not statistically significant, but more information is known about BGSU’s main campus population in regards to food insecurity and resource usage.

Future Research. Future research that has similar objectives to this study can be used to create short-term and long-term assistance. Short-term assistance research would focus on making the process of food pantry visitation easier. This would include making food pantry usage less embarrassing, along with increasing the awareness about the availability and location of resources in Bowling Green. Long-term assistance research would focus on completing more assessments concerning why food insecurity exists at BGSU. This research could be used to reduce the amount of students that have food insecurity before the use of community resources is needed.

Future research can also be used to continue this current study since there was a low response rate. In addition, future research could include examination of food insecurity and community resource use by students that belong to certain populations, such as international students and graduate students.

References:

1. Patton-López MM, López-Cevallos DF, Cancel-Tirado DI, Vasquez L. Prevalence and correlates of food insecurity among students attending a midsize rural university in Oregon. *J Nutr Educ Behav.* 2014 May;46(3):209-214.
2. Freudenberg N, Manzo L, Jones H, Kwan A, Tsui E, Gagnon M. Food insecurity at CUNY: results from a survey of CUNY undergraduate students. City University of New York (New York): The Campaign for a Healthy CUNY; 2011 Apr
3. Coleman-Jensen A, Nord M, Singh A. Household food security in the United States in 2012. [Washington]: United States Department of Agriculture, Economic Research Service; 2013 Sept. 41 p. Report No.: ERR-155. Available from: http://www.ers.usda.gov/publications/err-economic-research-report/err155.aspx#.U9kYS7Ht_Qg
4. Definitions of food insecurity [Internet]. [updated 2014 Apr 30; cited 2013 Apr]. Available from: <http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/definitions-of-food-security.aspx#.U0yo5M0fCqk>
5. Heiselt AK, Briley CA. The day one leadership program: engaging campus in community hunger issues through service-learning. *Journal of Community Engagement & Higher Education.* 2010;1(2): 1-11.

6. Table 355. Average amount of financial aid awarded to full-time, full-year undergraduates, by type and source of aid and selected student characteristics: 2007-08. U.S. Department of Education, National Center for Education Statistics. 2007-08 National Postsecondary Student Aid Study (NPSAS:08); 2012. [cited 2013 Apr]. Available from: http://nces.ed.gov/programs/digest/d11/tables/dt11_355.asp
7. Sandoval F. Lingering insecurity sends students to campus food banks. *Chronicle of Higher Education*. 2012 Sept;59(3):27.
8. IPEDS data center [Internet]. [Washington]: U.S. Department of Education, National Center for Education Statistics. [date unknown] - [cited 2014 Jul 29]. Available from: <http://nces.ed.gov/ipeds/datacenter/InstitutionProfile.aspx?unitId=adabacafafac>
9. Table 347. Amount borrowed, aid status, and sources of aid for full-time, full-year postbaccalaureate students, by level of study and control and level of institution: Selected years, 1992-93 through 2007-08. U.S. Department of Education, National Center for Education Statistics, 1992-93, 1999-2000, 2003-04, and 2007-08 National Postsecondary Student Aid Studies. NPSAS:93, NPSAS:2000, NPSAS:04, and NPSAS:08; 2012 [cited 2013 Apr]. Available from: http://nces.ed.gov/programs/digest/d09/tables/dt09_347.asp
10. Durando J. Students get a crash course in economics. *USA Today* 2009 Mar 3: Sect: Life:07d
11. NW Ohio college opens food bank. *Community College Week* 2012 Feb 20:24(14); 14
12. Marklein MB. USA today's 2010 all-USA community college academic team. *USA Today*. 2010 Apr 19: Sect. Life:04d
13. Financially struggling college students turn to food banks. *Diverse: Issues in Higher Education*. 2008 Aug;25(14):15.
14. Changes in food price indexes, 2012 through 2015. United States Department of Agriculture, Economic Research Service; United States Department of Labor, Bureau of Labor Statistics; 2014 Jul 25 [cited 2014 Jul 30]. Available from: <http://www.ers.usda.gov/data-products/food-price-outlook.aspx#.U9khJM3Ftbw>
15. Volpe R, Kuhns A. Food price outlook, 2014-15 [Internet]. [updated 2014 Jul 25; cited 2014 Jul 30]. Available from: <http://www.ers.usda.gov/data-products/food-price-outlook/summary-findings.aspx#.U9kWjs3Ftbw>
16. Food at home: total expenditures. United States Department of Agriculture; 2012 Oct
17. Employment cost index historical listing – Volume III, Current Dollar, March 2001 – March 2014 (December 2005=100) [Internet]. [Washington]: U.S. Bureau of Labor Statistics. Office of Compensation Levels and Trends; 2014 Apr [cited 2014 Jul 31]. Available from: <http://www.bls.gov/web/eci/echistrynaics.pdf>
18. Powers L. Pantries tackle campus hunger. *USA Today* 2012 Feb 27: Sect. News:03a
19. Martin KS, Cook JT, Rogers BL, Joseph HM. Public versus private food assistance: barriers to participation differ by age and ethnicity. *J Nutr Educ Behav*. 2003 Sept-Oct;35(5):249-54.
20. Tennessee state university operates a food bank for students in need. *The Journal of Blacks in Higher Education* [Internet]. 2012 Nov 9 [cited 2013 Apr]. Available from: <http://www.jbhe.com/2012/11/tennessee-state-university-operates-a-food-bank-for-students-in-need/>
21. Johnson H. How to create a random sample in Excel [Internet]. 2012 Jun 8 [cited 2013 Dec]. Available from: <https://www.surveymonkey.com/blog/en/blog/2012/06/08/random-sample-in-excel/>

22. Raosost. Sample size calculator [Internet]. 2004 [cited 2014 Jul 31]. Available from:<http://www.raosoft.com/samplesize.html>
23. Ajzen I. Constructing a theory of planned behavior questionnaire. [cited 2014 Jul 30]. Available from: <http://people.umass.edu/~ajzen/pdf/tpb.measurement.pdf>
24. [cited 2013 October]. Available from: <http://www.bgsu.edu/offices/mc/news/2010/news81915.html>
25. Valdosta State University. Non-traditional students [Internet]. 2014 [cited 2013]. Available from: <http://www.valdosta.edu/admissions/undergraduate/student-information/non-traditional-students.php>
26. Hughes R, Serebryanikova I, Donaldson K, Leveritt M. Student food insecurity: the skeleton. *Nutr Diet*. 2011 Mar; 68(1): 27–32.
27. Chock TM. The influence of body mass index, sex, and race on college students' optimistic bias for lifestyle healthfulness. *J Nutr Educ Behav*. 2011; 43(5): 331-338.
28. Headcount enrollment by major [Internet]. [Bowling Green (OH)]: Bowling Green State University, Office of Institutional Research; [updated 2010 Oct 14; cited 2014 Jul 30]. Available from: <http://www.bgsu.edu/content/dam/BGSU/ir/documents/fact-book/enrollment/by-plan.pdf>
29. Headcount enrollment by age [Internet]. [Bowling Green (OH)]: Bowling Green State University, Office of Institutional Research; [cited 2014 Jul 30]. Available from: <http://www.bgsu.edu/institutional-research/bgsu-fact-book/headcount-enrollment-with-student-characteristics.html>
30. Headcount enrollment by gender [Internet]. [Bowling Green (OH)]: Bowling Green State University, Office of Institutional Research; [cited 2014 Jul 30]. Available from: <http://www.bgsu.edu/institutional-research/bgsu-fact-book/headcount-enrollment-with-student-characteristics.html>
31. Headcount enrollment by ethnicity [Internet]. [Bowling Green (OH)]: Bowling Green State University, Office of Institutional Research; [cited 2014 Jul 30]. Available from: <http://www.bgsu.edu/institutional-research/bgsu-fact-book/headcount-enrollment-with-student-characteristics.html>
32. Headcount enrollment by living arrangements [Internet]. [Bowling Green (OH)]: Bowling Green State University, Office of Institutional Research; [updated 2010 Nov 24; cited 2014 Jul 30]. Available from: <http://www.bgsu.edu/content/dam/BGSU/ir/documents/fact-book/enrollment/HEADCOUNT-ENROLLMENT-BY-LIVING-ARRANGEMENTS.pdf>

Appendix 1

Food Pantry Needs Assessment:

Information needed to take survey:

-When the word “you” is mentioned, it includes others (such as parents and guardians) that help you pay expenses.

-When the phrase “food you need” is mentioned, it refers to food/beverages that are needed to

live a healthy and nourishing life. Fruit, vegetables, and water are examples. Alcohol, expensive coffee drinks, and high-priced restaurants would not be included.

-Definition of the phrase “non-traditional student:” students who are coming to college after a military career or time spent raising a family, or who are ready to get a college degree 5 or more years after graduating from high school. (24-25)

-Definition of term “food insecurity”:

USDA's labels describe ranges of food security (4)

Food Security

- **High food security** (*old label=Food security*): no reported indications of food-access problems or limitations.
- **Marginal food security** (*old label=Food security*): one or two reported indications--typically anxiety over food sufficiency or shortage of food in the house. Little or no indication of changes in diets or food intake.

Food Insecurity

- **Low food security** (*old label=Food insecurity without hunger*): reports of reduced quality, variety, or desirability of diet. Little or no indication of reduced food intake.
- **Very low food security** (*old label=Food insecurity with hunger*): Reports of multiple indications of disrupted eating patterns and reduced food intake.

Questions:

1. What is your age?:

- 18-22
- 23-30
- 31-40
- 41 or older

2. What is your gender?:

- Female
- Male
- Other

3. What is your race (choose one):

- American Indian
- Asian
- Black or African American
- Latino or Hispanic

- Pacific Islander
- White/Caucasian
- Biracial or Multiracial
- Other (fill-in the blank option)

4. Are you an International Student? If so, what country are you from?:

- Yes, I am International Student. I am from (fill-in the blank option).
- No, I am not an International Student

5. What is your marital status?: (choose one)

- Single (I have never been married)
- Married/Remarried
- Separated
- Divorced/Widowed

6. How many children do you have?

- 0
- 1-2
- 3-4
- 5+

7. Do you commute to school?

- Yes
- No

8. Are you financially independent from your parents/guardians/others? (choose one)

- 1 completely independent (I pay for all of my expenses)
- 2 somewhat independent (I pay for most of my expenses, but I receive some help from parents/guardians/others)
- 3 neutral (I pay for about half of my expenses, and my parents/guardians/others pay for the other half)
- 4 somewhat dependent (I pay for some of my expenses, but most expenses are paid by my parents/guardians/others)
- 5 completely dependent (My parents/guardians/others pay for all of my expenses)

9. What is your level of income (the word “your” can refer to parents/guardians/others in addition to yourself, if you have some level of financial dependence):

- Below \$10,000/year
- \$10,000-\$29,999/year

- \$30,000-\$49,999/year
- \$50,000-\$99,999/year
- \$100,000-\$149,000/year
- \$150,000-\$249,999/year
- \$250,000/year or more

10. How many hours a week do you work on average when attending school? (choose one):

- Not employed
- 1-10
- 11-20
- 21-30
- 31-40
- 41+

11. a.) What type of financial aid do you receive? (check all that apply):

- Grants
- Scholarships
- Work Study
- Loans
- Aid from the Military
- Not applicable; I do not receive aid

b.) How much total financial aid do you receive on average per year?:

- Less than \$500
- \$500-\$999
- \$1,000-\$4,999
- \$5,000-\$9,999
- \$10,000-\$14,999
- \$15,000+

12. If you had an extra \$100 to spend in a week, how would you spend it? (Check all that apply):

- Food
- Bill for cable/Internet/Smartphone
- Car payment
- Rent
- Health Care costs
- Apparel
- Alcohol/Tobacco
- Other: _____

13. What establishments do you choose to get food? (please rank these options from 1 to 8, with

1 being the place you get food from the most often, and 8 being the place you get food from least often):

- Grocery store
- Fast food place
- Sit down restaurant
- Gas station
- Discount store
- Take out/ Delivery
- Food pantry or free meal service
- Other: _____

14. What foods do you choose when getting food? (Check all that apply):

- Already prepared foods/ foods prepared for you at establishment
- Frozen
- Individual ingredients to make a dish
- Buying in bulk
- Other: _____

15. How many times per week do you get food, on average? (choose one)

- Zero
- 1-2
- 3-4
- 5 or more

16. How much money, on average, do you spend each time you get food? (choose one that applies most to your situation)

- \$0-24
- \$25-49
- \$50-74
- \$75-99
- \$100+

17. How would you describe your food security/insecurity? (refer to definitions at the beginning; choose one)

- High Food Security
- Marginal Food Security
- Low Food Security
- Very Low Food Security

18. How confident do you feel that you can afford your next meal? (Please drag the slide bar to the correct amount)

-slide bar option (can choose anywhere from 0 to 100%)

19. How many times a month are you unable to afford food you need? (choose one)

-Zero

-1-3

-4-6

-7-9

-10 or more

20. How many times per month do you skip meals because you cannot afford them? (choose one)

-Zero

-1

-2

-3

-4 or more

21. What do you believe is keeping you from affording food that you need? (check all that apply):

-Lack of employment

-Low paying job

-Poor money management skills

-Don't meet state criteria for financial assistance

-No available resources/family/friends that you can ask for financial assistance

-Alcohol, tobacco, and/or drug use

-Other health-related conditions

-Other: _____

-Not applicable; I can afford the food I need

22. Are you currently using resources in Bowling Green to help you with your food insecurity? (choose one)

-Yes

-No

-No, I am not aware of these resources

-No; not applicable since I feel I have food security

23. If you answered yes to the previous question, please state what resources you use (check all that apply):

-St. Thomas Moore Food Pantry

-Bowling Green Christian Food Pantry

-Martha's Kitchen at the First United Methodist Church

-Other: _____

24. If you answered the previous question, please state how many times a month you visit these resources on average (choose one):

-1-3 times

-4-6 times

-7 or more times

25. If you answered the previous question, please state how comfortable you feel using resources in Bowling Green for your food insecurity? (choose one)

-I receive help, and I feel comfortable using the resources

-I receive help, and I feel somewhat comfortable using the resources

-I receive help, and I do not feel comfortable using the resources

26. If you answered the previous question, and do not feel comfortable, why is that? (Check all that apply):

-Unfriendly staff

-Embarrassment

-It is hard to find transportation to the resources

-Other: _____

27. If you are food insecure and do not use a resource to help with food insecurity, please explain why (Check all the apply):

-Lack or transportation to resources

-Embarrassment

-I do not know where the resources are located

-I don't think I am eligible

-Not able to carry food home from food pantry

-Other: _____

28. Do you know of any student(s) (other than yourself) currently receiving help for their food

insecurity food insecurity?

-Yes; please classify: (check all that apply)

-Off campus student

-Undergraduate student

-Graduate student

-Non-traditional Student

-Other Classification: _____

-No

-I may, but I am not completely sure

Question 29. For the following questions, please select the number that best identifies your opinion. Answer the questions that are applicable to your situation.

1. College students are struggling financially.

-1=completely agree, 7=completely disagree

2. College students are well off financially.

-1=completely agree, 7=completely disagree

3. It is normal if college students are not able to afford food.

-1=completely agree, 7=completely disagree

4. It is acceptable if college students are not able to afford food.

-1=completely agree, 7=completely disagree

5. My ability to get food is entirely up to me.

-1=completely agree, 7=completely disagree

6. Most people who are important to me approve of food pantries.

-1=completely agree, 7=completely disagree

7. Food pantries are a good idea.

-1=completely agree, 7=completely disagree

8. It would be okay if I had to use a food pantry.

-1=completely agree, 7=completely disagree

9. Most people who are important to me would approve of my use of food pantries.

-1=completely agree, 7=completely disagree

10. My friends think I should visit a food pantry.

-1=completely agree, 7=completely disagree

11. Food insecure students at Bowling Green State University have visited a food pantry in the last 3 months.

-1=completely agree, 7=completely disagree

12. I intend to visit a food pantry within the next three months.

-1=completely agree, 7=completely disagree