

## **Food Insecurity Among College Students: A Call for Action in Higher Education**

Sarah Bubeck

Faculty Mentors:

Shiloh Erdley-Kass, Department of Anthropology, Sociology, Criminal Justice, and Social Work, Commonwealth University- Bloomsburg

Kevin Lally, Department of Anthropology, Sociology, Criminal Justice, and Social Work, Commonwealth University- Bloomsburg

Seokwon Yoon, Department of Anthropology, Sociology, Criminal Justice, and Social Work, Commonwealth University- Bloomsburg

Whitney Robenolt, Student Success Department, Commonwealth University - Bloomsburg

Susan Dauria, Department of Anthropology, Sociology, Criminal Justice, and Social Work, Commonwealth University- Bloomsburg

### **ABSTRACT**

The objective of this study was to understand food insecurity experiences and barriers preventing food security among college students at a rural public university. The study involved undergraduate students (n=489) from a rural public university in the United States. Students were administered a survey including questions regarding demographics and perceptions of food access, barriers, and resources. Chi-square analysis was used to examine potential relationships between student characteristics and food security perceptions and behaviors, as well as risk and protective factors. There were significant associations between student characteristics (GPA, gender, socioeconomic status [SES], and race) and food security. Findings indicated that students with a GPA above 2.9 reported higher food security in terms of not feeling hungry in class (77.3%; n=259). Additionally, white students (67.3; n=263) and those identified as high SES (76.1%; n=70) perceived themselves as more food secure, particularly in access to nutritious meals and fruits and vegetables (70.7%; n=65). Results indicate that social capital, higher GPAs, and financial security act as protective factors, influencing food security outcomes. Gender and race identity also play roles in food security knowledge and access. These findings suggest a continued need for the development of campus-wide food programs that ensure equitable access to nutritious foods as a fundamental right.

**Keywords:** Food Pantry; Nutrition; Academic; Barriers; University Health; Food Resources

Adequate access to nutritional foods to ensure healthy development and quality of life through socially acceptable means, otherwise known as food security, is a social issue that continues to gain attention in public and national health forums

(USDA, 2022; Fleischhacker & Bleich, 2021). For college students, food insecurity incidents are higher than any other group in the United States and range between 23% and 68% (Cady, 2014; Chaparro et al., 2009; National Center for Education

Statistics, n.d.; Owens et al., 2020; Payne-Sturges et al., 2017). These rates are concerning given that the national average of food insecurity was reported to be 10.4% by the United States Department of Agriculture (USDA, 2022). Attention to this social problem is vital given that nutritional health has important benefits and connections to quality of life. Research suggests that healthy eating habits and consumption of frequent nutritional meals have profound effects on sleep, mental health, relationships, and academic performance (Reuter et al., 2020).

The World Health Organization (WHO) asserts that eating healthy food is a critical factor that affects holistic health outcomes and is affected by social, economic, and educational factors (Affret et al., 2017). Understanding these factors has become an increasing priority for college administrators and youth advocates. Furthermore, the potentially negative consequences of poor nutritional health on educational outcomes, retention rates, and employability, make addressing this social problem a priority for students, families, and educational institutions.

This study contributes to the growing body of literature that examines the perceptions and needs of college students and the effects of nutritional food awareness, access, and consumption on important life outcomes. The goal of this study is to examine the perceptions and reported behaviors of college students regarding nutritional health and food security.

### **Food Insecurity Measurement**

Food insecurity has been measured through the United States Food Security Survey Module (AFSSM) and the United States Household Food Security Survey Module (HFSSM). Questions in these surveys address topics of lack of money and other resources that are used to obtain food. Previous studies have categorized students as food secure or food insecure

(Cady, 2014; El Zein et al., 2018; Henry, 2017; Owens et al., 2020). Food secure students were classified as being high food secure or marginally food secure. High food security was defined as having no food access problems, marginal food security was defined as having slight anxiety over food situations (El Zein et al., 2018). Food insecure students were classified as being low food secure or very low food secure. Low food security was defined as reduced diet quality and variety of foods, very low food security was defined as having multiple indications of disrupted eating patterns and reduced food intake (El Zein et al., 2018). It should also be mentioned that there are two additional types of food insecurity, with hunger and without hunger.

### **Risk and Protective Factors**

Understanding the prevalence of food insecurity and the barriers that prevent food security are necessary for developing effective health programming on college campuses. The WHO reports that using an ecological framework is an effective method for understanding how social behaviors and environmental determinants affect risk for food insecurity (WHO, 2019). The ecological model can further be used to identify how individual and environmental factors increase or reduce a student's risk for food insecurity. When using this approach to understand food insecurity among college students, many contextual factors need to be considered.

For many students, college represents the first time living away from home and facing the challenges of separation from family and friends. The transition to college introduces unique vulnerabilities to food insecurity among students. Reduced social support systems can be associated with decreased access to food and awareness of healthy food options and are likely compounded by feelings of isolation (Chaparro et al., 2009).

Socioeconomic factors should also be considered when seeking to understand why a student may be at risk for being food insecure (College Board, 2016; El Zein et al., 2018). Students with limited income may find balancing a budget difficult after accounting for housing and classwork expenses and are more likely to dismiss healthy eating when faced with prioritizing expenses (Fortin et al., 2020; Moore et al., 2020). Vulnerable student groups, such as Pell Grant recipients, first-generation, non-traditional, employed, and marginalized students are particularly at risk for experiencing food insecurity as they are more likely to prioritize costs associated with attending college over their physical and nutritional health. For these groups, food insecurity can also occur as a result of low self-efficacy for preparing healthy meals and limited financial and food literacy (El Zein et al., 2018; Gaines et al., 2014; Watson et al., 2017).

Understanding social and individual factors, such as self-efficacy, financial and food literacy as well as, coping and help seeking behaviors is needed to increase awareness of essential protective factors and to develop future best practices. According to the research, emotional and physical stress can disrupt eating patterns and reduce access to systems that promote food literacy and access, and conversely, can negatively impact motivation and emotional and physical well-being (Badger et al., 2019; Cuberos et al. 2019). More importantly, students experiencing food insecurity are likely able to reduce emotional and physical symptoms of stress when they increase access to regular and healthy meals. For many students, this means addressing feelings of embarrassment, social stigma, food literacy barriers, and increasing self-worth and efficacy regarding accessing food pantries and social support systems (Brito-Silva et al., 2022; Chaparro et al., 2009; El Zein et al., 2018).

Although food pantries are a vital resource for individuals experiencing food insecurity, studies suggest that students are not accessing these resources at a rate that matches their need (Brito-Silva et al., 2022; El Zein et al., 2018; El Zein et al. 2022). El Zein (2019) found in a sample of 855 students across eight universities that although almost 40% of the students in the study were classified as food insecure, roughly 33% of those students reported using the food pantry. The awareness and normalization of any food assistance programs for students are of paramount importance. To mitigate concerns associated with stigma and inconvenience, it is imperative that students possess a clear understanding of the eligibility requirements and accessibility of these programs (Hagedorn-Hatfield et al., 2022).

## **METHODS**

### **Sample and Dataset**

This study used a non-probability sampling method, particularly convenience sampling design. The data was collected from 492 students at Bloomsburg University, which is a public university located in northeastern Pennsylvania. Bloomsburg University has approximately 6,500 students on campus. The surveys, which were approved by Bloomsburg University's Institutional Review Board, were collected in 2022 using Qualtrics. After cleaning the data, 489 responses were used for the statistical analyses. Students were recruited for this survey through their university emails. Professors were emailed information about the study to discuss and promote the survey in class to their students. The research team did not include the recruitment script for professors in the appendix because the scripts varied among the professors.

Table 1 (see Appendix) shows the demographic characteristics of the sample. Almost all participants are between first

year and fourth year (94.9%). Among the participants, 68.5% have a GPA of 3.0 or higher. Most participants are female (72.6%). Among the respondents, the majority are first year and second year students (60.8%). The majority of the respondents are Whites (80%). 91 percent of the respondents indicated one ethnicity. 56.5% of the respondents reported being very religious or somewhat religious. With regard to socioeconomic status, about 61 percent of the respondents were middle class. Around 50 percent indicated they were from rural areas and around 43 percent indicated they were from suburban areas.

### **Variables**

***Dependent Variables.*** The dependent variable, food insecurity, was measured with three aspects of food insecurity: hungry at class, nutritious meals, and fruits and veggies. Hungry at class was operationalized as answers to the question, “How often do you go to class hungry?” Nutritious meals was operationalized as answers to the question, “How often do you eat a nutritious meal? Fruits and vegetables was measured as answers to the question, “How often do you eat fruits and vegetables with your meals?” All items were rated on a 5-point Likert scale (1=never, 2=sometimes, 3=about half the time, 4=most of the time, and 5=always). This dependent variable was used to conceptualize a full understanding of food insecurity based off the questions asked in the survey.

***Independent Variables.*** The independent variables for this study are the risk factors and protective factors. The risk factors can be defined as any barriers for keeping students from accessing food resources. Risk factors include social stigma or embarrassment about using a food pantry, not enough information regarding awareness of a food pantry on campus, inconvenience of hours of operations, knowledge about the eligibility,

feeling like the food pantry is not for them, and greatness of food options. The six questions utilized Likert-scale responses that ranged from 1 (strongly disagree) to 5 (strongly agree).

The protective factors can be defined as student involvement in any activities in college. These factors include five components, involvement in Greek organizations, athletics, members of living or learning communities, academic clubs, and social or special interest clubs. These questions were asked to respond to 0 (no) or 1 (yes).

***Data Analysis.*** In this study, two tests were conducted to analyze the data. Descriptive statistics were used to report the characteristics of the respondents and the variables used in this study. Chi-square analysis was used to examine whether the relationship exists between the independent variables and dependent variables. Factors and demographics that are not discussed were not statistically significant in relation to food insecurity.

See Appendix for Table 2 Student Involvement and Table 3 Variables Characteristics.

## **RESULTS**

### **Participants’ Characteristics and Food Security**

The results show that there are significant relationships between some participants’ characteristics and food security. Specifically, there is a significant relationship between GPA and food security for nutritious meals and fruits and veggies. There is also a significant relationship between gender and food security in hunger in class and in nutritious meals.

With regard to race variables, there was a significant relationship between race and food security in nutritious meals. White

students indicated more food security in nutritious meals (67.3%; n=263). There is also a significant relationship between ethnicity and food security in nutritious meals. Of the students who indicated one ethnicity, the majority believed they are food secure in nutritious meals (65.4%; n=291). There are significant relationships respectively between socioeconomic status (SES) and food security in hungry at class, food security in nutritious meals, and food security in fruits and veggies. The majority of students who indicated middle class in SES status, believed that they are food secure in hungry at class (77.5%; n=231). Of students who indicated high class in SES status, the majority believed that they are food secure in nutritious meals (76.1%; n=70), and in fruits and veggies (70.7%; n=65).

### **Risk Factors and Food Security**

Analysis found a significant relationship between the risk factor of stigma and food security in fruits and veggies. Of students who indicated social stigma or embarrassment about using a food pantry, 61.2% believed that they felt food security in fruits and veggies (n=230).

### **Protective Factors and Food Security**

There is a significant relationship between the protective factor of involvement in a Greek organization and food security in hunger in class. There is a significant relationship between participating in academic clubs and food security in fruits and veggies. Of the participants not involved in Greek organizations, the majority believed that they felt food security in hungry at class (77.3%; n = 331). It should be noted that this represented a relatively small portion of the overall sample (n=59). Of the participants involved in an academic club, moreover, the majority indicated that they felt food security in fruits and veggies (64.9%; N = 113).

See Appendix for Table 4 Chi-Square Analysis.

## **DISCUSSION**

The purpose of this study was to examine the reported behaviors of college students regarding nutritional health and food security, including the awareness and use of local food pantries. The researchers sought to identify reported food security risk and protective factors for the purposes of improving health programming outreach to all students, but particularly those who may be at a higher risk for food insecurity.

The results of this study indicated food insecurity rates that were similar to national rates reported among college students in the United States with 25.4% of respondents reporting being hungry in class (El Zein et al., 2019). The study also uncovered that 36.8% of students reported experiencing food insecurity with nutritious meals and nearly half the sample, 41.1% reported feeling insecure with fruits and vegetables. These statistics have important implications for future health programming given the relationship between a healthy diet and long-term health outcomes for young adults. Poor nutrition has negative consequences on mental health, physical health, and academic success during college and potentially longer-term negative effects on employability, social mobility, mental and physical health, and mortality (Amegbletor et al., 2023; El Zein et al., 2018; El Zein et al., 2022; Martinez et al., 2017). The significant relationship found between a high GPA and food security for nutritious meals and fruits and veggies in this study is further reflective of this previous scholarship.

Gender differences also aligned with former studies indicating higher rates of food insecurity among women (Johnson et al., 2018). Racial and economic status differences were consistent with previous research that suggests that white and higher

SES students are more likely to report feeling food secure than non-white and lower SES students (Brown et al., 2021; El Zein et al., 2019; Hiller et al., 2021; Payne-Sturges et al., 2017). Although more information is needed to better understand this relationship, it is likely that food literacy among the lower SES students contributed to the lower SES students not feeling food secure with nutritious meals or with fruits and veggies.

This study also sought to understand food security protective and risk factors and uncovered findings consistent with research that suggests that individual and environmental factors can influence food security perceptions and behaviors among college students. This is also consistent with public health and policy efforts that suggest using an ecological framework (El Zein et al., 2017; Fortin et al., 2020; Seligman and Berkowitz, 2019 WHO, 2019). Consistent with the literature, this study uncovered a negative relationship between limited social support and stigma and food security perceptions and behaviors (Fortin et al., 2020; Peterson et al., 2022; Story et al., 2022; Willis, 2020). Although the percentage of students reporting academic club involvement was small (n=174; 35.7%), the relationship between this group and food security with fruits and veggies was significant. This finding aligns with research that suggests that university support in the form of community, club, and peer/mentor support is an important component that may influence food security perceptions and behaviors (Watson et al., 2017). Still, it is important to consider that there are many factors that can influence food literacy. Even when students present with a clear awareness of the importance of eating nutritious meals and fruits and vegetables, knowledge of nutrition is not necessarily a protective factor. Socioeconomic status may be more influential in determining food security than food literacy and this is no surprise given that research suggests that

lower socioeconomic status and economic stability serve as significant risk factors for food insecurity for families reporting lower incomes (Coleman-Jensen et al., 2015; Coleman-Jensen et al., 2016; Gundersen et al., 2011; Walker et al., 2021).

Final important findings include student perceptions and behaviors regarding accessing food pantries. Findings are consistent with research that suggests that students are often hesitant to engage in help seeking behaviors because of feelings associated with stigma, shame, and embarrassment (Henry, 2017; El Zein). Similar to previous studies, students reported that the primary barriers to using the food pantry at their school were social stigma and embarrassment (Brito -Silva et al., 2022; El Zein et al., 2017; Peterson et al., 2022). Additionally, findings suggest it is important to consider how social stigma could potentially impact food literacy regarding knowledge and understanding of how to access and prepare healthy foods. Consistent with the literature, our study uncovered that students may be less likely to seek out information regarding access to and benefits of healthy foods due to feelings of stigma and embarrassment (Peterson et al. 2022). Students may have basic information about the importance of eating fruits and vegetables, but they may benefit from more knowledge regarding how eating fruits and vegetables can impact physical and mental health and reduce future comorbidities. More studies are needed to examine the relationship between food literacy and health promotion literacy to develop effective interventions and to prevent poor individual and societal outcomes.

### **Limitations**

The study's design focused on a single point in time, limiting the ability to establish a cause-and-effect relationship between food insecurity and other factors. Moreover, the study's design did not allow us to determine whether food insecurity

experienced by the participants was a temporary or ongoing situation. Reliance on self-reports remains a limitation. Furthermore, the study did not collect data on student spending habits, which could have provided information on how these habits are correlated with food insecurity. The study found that a significant proportion of respondents identified as first-year students. It is recommended to make greater efforts to engage with students from additional academic years.

Additionally, questions regarding mental health status were not included when calculating the prevalence of food insecurity. As a result, some students classified as food insecure may be experiencing the effects of mental illnesses rather than actual food insecurity. In future studies, it is recommended that researchers explore the potential impact of mental health on food insecurity.

### **Implications for Higher Education and Health Programming**

This research has identified that there are many essential factors that increase students' likelihood of having food security while in higher education. Advocating for changes within higher education campuses may promote the establishment of strategies to reduce barriers of food security. Some of these strategies may include building awareness on campuses, consistently promoting food insecurity resources to the student body, and implementing access to food care packages.

Stigma can be a large component in terms of whether students feel comfortable accessing food insecurity options on campuses. Therefore, engaging in accurate discussions in both private and public settings, may improve knowledge related to food insecurity, and its available resources. Higher education institutions can promote this knowledge and reduce potential stigma by implementing a multitude of campus wide goals. For example, campuses can require students to attend educational

modules related to this topic, where accurate information and helpful, exploratory, conversations can be had. These modules can be embedded into orientation events or first year experience programming. In addition, institutions can host events throughout the year, in the form of interactive, tabling, events that are tailored towards student support resources on campus.

Higher education institutions can also begin implementing regularly scheduled food security assessments for their students. Engaging in a more private assessment may encourage students to answer more accurately, due to decreased social/peer pressure. If students are determined to be experiencing food insecurity that student can be “flagged” and provided with follow up support.

It is also essential to challenge biases and stereotypes related to the “typical” student base that struggles with food insecurity. Students can struggle with food insecurity even while paying for meal plans on campus. Properly recognizing warning signs and indications that a student may be food insecure can be encouraged through faculty and staff training. Faculty can discuss food insecurity and its impact on success and engagement at the start of the semester, providing resources both in-person and in their course syllabi. Staff within student support services, residence life, and health and wellness can all make it a priority to assess every student for food security. Additionally, institutions can engage in a “care package” program, which can be stored in faculty offices and provided to students any time they may encounter a student reporting or indicating need.

### LITERATURE CITED

- Affret, A., Severi, G., Dow, C., Rey, G., Delpierre, C., Boutron-Ruault, M., Calvel-Chapelon, F., and Fagherazzi, G. 2017. Socio-economic factors associated with a healthy diet: Results from the E3N study. *Public Health Nutrition*, 20(9), 1574-1583. <https://doi.org/10.1017/s1368980017000222>
- Amegbletor, D. Y., Goldberg, D. M., Pope, D. A., and Heckman, B. W. 2023. Food and nutrition security as social determinants of health: Fostering collective impact to build equity. *Primary Care: Clinics in Office Practice*, 50(4), 633-644. <https://doi.org/10.1016/j.pop.2023.05.006>
- Badger, J., Quatromoni, P. A., and Morrell, J. S. 2019. Relationship between stress and healthy lifestyle factors of college students. *Health Behavior and Policy Review*, 6(1), 43-55. <https://doi.org/10.14485/hbpr.6.1.4>
- Bowen, S., Elliott, S., and Hardison-Moody, A. 2021. The structural roots of food insecurity: How racism is a fundamental cause of food insecurity. *Sociology Compass*, 15(7). <https://doi.org/10.1111/soc4.12846>
- Brito-Silva, F., Wang, W., Moore, C. E., Warren, C., Miketinas, D., Tucker, W., and Davis, K. 2022. College campus food pantry program evaluation: What barriers do students face to access on-campus food pantries? *Nutrients*, 14(14), 2807. <https://doi.org/10.3390/nu14142807>
- Cady, C. (2014). Food insecurity as a student issue. *Journal of College and Character*, 15(4). <https://doi.org/10.1515/jcc-2014-0031>
- Chaparro, M. P., Zaghoul, S., Holck, P., and Dobbs, J. 2009. Food insecurity prevalence among college students at the University of Hawai'i at Mānoa. *Public Health Nutrition*, 12(11), 2097-2103. <https://doi.org/10.1017/s136898000990735>
- Coleman-Jensen, A., Rabbitt, M. P., Gregory, C., and Singh, A. 2015. Household food security in the United States in 2014. *Economic Research Report*. <https://doi.org/10.22004/ag.econ.262204>
- Coleman-Jensen, A., Rabbitt, M. P., Gregory, C., and Singh, A. 2016. Household food security in the United States in 2015. *Economic Research Report*, (215). <https://doi.org/10.22004/ag.econ.262191>
- College Board. 2016. Trends in college pricing 2016. [https://trends.collegeboard.org/sites/default/files/2016-trends-college-pricing-web\\_0.pdf](https://trends.collegeboard.org/sites/default/files/2016-trends-college-pricing-web_0.pdf)
- Cuberos, R. C., Zurita-Ortega, F., Olmedo-Moreno, E. M., and Castro-Sánchez, M. 2019. Relationship between academic stress, physical activity and diet in university students of education. *Behavioral Sciences*, 9(6), 59. <https://doi.org/10.3390/bs9060059>
- El Zein, A., Mathews, A., House, L., and Shelnutt, K. P. 2018. Why are hungry college students not seeking help? Predictors of and barriers to using an on-campus food pantry. *Nutrients*, 10(9), 1163. <https://doi.org/10.3390/nu10091163>
- El Zein, A., Shelnutt, K. P., Colby, S., Olfert, M., Kattelman, K., Brown, O.,



- Kidd, T., Horacek, T., White, A., Zhou, W., Vilaro, M., Greene, G., Morrell, J., Riggsbee, K., and Mathews, A. 2017. Socio-demographic correlates and predictors of food insecurity among first year college students. *Journal of the Academy of Nutrition and Dietetics*, 117(10), A146.
- El Zein, A., Shelnutt, K. P., Colby, S., Vilaro, M., Zhou, W., Greene, G., Olfert, M., Riggsbee, K., Stabile-Morrell, J., and Mathews, A. 2019. Prevalence and correlates of food insecurity among U.S. college students: A multi-institutional study. *BMC Public Health*, 19(1). <https://doi.org/10.1186/s12889-019-6943-6>
- El Zein, A., Vilaro, M. J., Shelnutt, K. P., Walsh-Childers, K., and Mathews, A. 2022. Obstacles to university food pantry use and student-suggested solutions: A qualitative study. *PLOS ONE*, 17(5), e0267341. <https://doi.org/10.1371/journal.pone.0267341>
- Fleischhacker, S., and Bleich, S. N. 2021. Addressing food insecurity in the United States during and after the COVID-19 pandemic: The role of the Federal Nutrition Safety Net. *Journal of Food Law & Policy*, 17(1), 8. <https://scholarworks.uark.edu/cgi/viewcontent.cgi?article=1280&context=jflp>
- Fortin, K., Harvey, S., and White, S. H. 2020. Hidden hunger: Understanding the complexity of food insecurity among college students. *Journal of the American College of Nutrition*, 40(3), 242-252. <https://doi.org/10.1080/07315724.2020.1754304>
- Gaines, A., Robb, C., Knol, L. L., and Sickler, S. 2014. Examining the role of financial factors, resources and skills in predicting food security status among college students. *International Journal of Consumer Studies*, 38(4), 374-384. <https://doi.org/10.1111/ijcs.12110>
- Gundersen, C., Kreider, B., and Pepper, J. V. 2011. The economics of food insecurity in the United States. *Applied Economic Perspectives and Policy*, 33(3), 281-303. <https://doi.org/10.1093/aep/ppr022>
- Hagedorn-Hatfield, R. L., Hood, L. B., and Hege, A. 2022. A decade of college student hunger: What we know and where we need to go. *Frontiers in Public Health*, 10. <https://doi.org/10.3389/fpubh.2022.837724>
- Henry, L. 2017. Understanding food insecurity among college students: Experience, motivation, and local solutions. *Annals of Anthropological Practice*, 41(1), 6-19. <https://doi.org/10.1111/napa.12108>
- Hiller, M. A., Winham, D. M., Knoblauch, S. T., and Shelley, M. 2021. Food security characteristics vary for undergraduate and graduate students at a Midwest university. *International Journal of Environmental Research and Public Health*, 18(11), 5730. <https://doi.org/10.3390/ijerph18115730>
- Johnson, C., Sharkey, J. R., Lackey, M., Adair, L., Aiello, A., Bowen, S., Fang, W., Flax, V., and Ammerman, A. 2018. Relationship of food insecurity to women's dietary outcomes: A systematic review. *Nutrition Reviews*. Published online September 3, 2018. <https://doi.org/10.1093/nutrit/nuy042>

- Martinez, S. M., Webb, K., Frongillo, E. A., and Ritchie, L. D. 2017. Food insecurity in California's public university system: What are the risk factors? *Journal of Hunger & Environmental Nutrition*, 13(1), 1-18. <https://doi.org/10.1080/19320248.2017.1374901>
- Moore, C. E., Davis, K. E., and Wang, W. 2020. Low food security present on college campuses despite high nutrition literacy. *Journal of Hunger & Environmental Nutrition*, 16(5), 611-627. <https://doi.org/10.1080/19320248.2020.1790460>
- National Center for Education Statistics. (n.d.). National Postsecondary Student Aid Study - Overview. <https://nces.ed.gov/surveys/npsas/>
- Owens, M. R., Brito-Silva, F., Kirkland, T., Moore, C., Davis, K., Patterson, M., Miketinas, D., and Tucker, W. 2020. Prevalence and social determinants of food insecurity among college students during the COVID-19 pandemic. *Nutrients*, 12(9), 2515. <https://doi.org/10.3390/nu12092515>
- Payne-Sturges, D., Tjaden, A., Caldeira, K. M., Vincent, K. B., and Arria, A. M. 2017. Student hunger on campus: Food insecurity among college students and implications for academic institutions. *American Journal of Health Promotion*, 32(2), 349-354. <https://doi.org/10.1177/0890117117719620>
- Peterson, N., Freidus, A., and Tereshenko, D. 2022. Why college students don't access resources for food insecurity: Stigma and perceptions of need. *Annals of Anthropological Practice*, 46(2), 140-154. <https://doi.org/10.1111/napa.12190>
- Reuter, P., Forster, B. L., and Brister, S. R. 2020. The influence of eating habits on the academic performance of university students. *Journal of American College Health*, 69(8), 921-927. <https://doi.org/10.1080/07448481.2020.1715986>
- Seligman, H. K., and Berkowitz, S. A. 2019. Aligning programs and policies to support food security and public health goals in the United States. *Annual Review of Public Health*, 40(1), 319-337. <https://doi.org/10.1146/annurev-publhealth-040218-044132>
- Story, C. R., Smith, E., Harvey, I. S., Thareja, G., and Hayes, J. 2022. Exploration of how emotional social support predicts food insecurity among college students. *Journal of American College Health*. Advance online publication. <https://doi.org/10.1080/07448481.2022.2128680>
- U.S. Department of Agriculture USDA. 2022. U.S. Adult Food Security Survey Module. Economic Research Service. <https://www.ers.usda.gov/media/8279/ad2012.pdf>
- Walker, R. J., Garacci, E., Dawson, A. Z., Williams, J. S., Ozieh, M. N., and Egede, L. E. 2021. Trends in food insecurity in the United States from 2011–2017: Disparities by age, sex, race/ethnicity, and income. *Population Health Management*, 24(4), 496-501. <https://doi.org/10.1089/pop.2020.0123>
- Watson, T. D., Malan, H., Glik, D. C., and Martinez, S. M. 2017. College students identify university support for basic needs and life skills as key ingredients in addressing food insecurity on campus. *California Agriculture*, 71(3),

130-138.

<https://doi.org/10.3733/ca.2017a0023>

Willis, D. 2020. Feeding inequality: Food insecurity, social status and college student health. *Sociology of Health and Illness*, 43(1), 220-237.

<https://doi.org/10.1111/1467-9566.13212>

World Health Organization (WHO). 2019. The state of food security and nutrition in the world 2019.

<https://www.who.int/publications/m/item/state-of-food-security-and-nutrition-in-the-world-2019>

Table 1: Demographic Characteristics of sample (N = 489)

Characteristics	Frequency (%)
Education	
1 <sup>st</sup> year	217 (44.1)
2 <sup>nd</sup> year	82 (16.7)
3 <sup>rd</sup> year	69 (14.0)
4 <sup>th</sup> year	99 (20.1)
5 <sup>th</sup> year	15 (3.0)
Graduates	10 (2.0)
GPA	
Below 2.9	154 (31.5)
3.0 – 3.4	176 (36.0)
3.5 – 4.0	159 (32.5)
Gender	
Male	134 (27.4)
Female	355 (72.6)
Race/Ethnicity	
Whites	391 (80.0)
African American	34 (7.0)
Hispanic	40 (8.2)
American Indian or Alaska Native	6 (1.2)
Asian	8 (1.6)
Others	10 (2.0)
Ethnicity	
One	445 (91.0)
Two	39 (8.0)
Three	5 (1.0)
Religiosity	
Not religious	213 (43.6)
Somewhat religious	244 (49.9)
Very religious	32 (6.5)
SES	
Lower	99 (20.2)
Middle	298 (60.9)
Upper	92 (18.8)

Political stance	
Democrat	137 (28.1)
Republican	136 (27.9)
Independent (lean Democrat)	54 (11.1)
Independent	58 (11.9)
Independent (lean Republican)	52 (10.7)
Others	51 (10.5)
Political view	
Conservative	111 (22.8)
Moderate	148 (30.4)
Liberal	137 (28.1)
Don't know/Unsure	91 (18.7)
Location	
Rural	246 (50.3)
Suburban	208 (42.5)
Metropolitan	35 (7.2)

Table 2: Student Involvement

Characteristics	Frequency (%)
Greek Org	
No	428 (87.9)
Yes	59 (12.0)
Varsity athlete	
No	413 (84.5)
Yes	76 (15.5)
Member of living or learning community	
No	356 (72.8)
Yes	133 (27.2)
Member of academic clubs	
No	314 (64.3)
Yes	174 (35.7)
Member of any social or special interest clubs	
No	352 (72.0)
Yes	137 (28.0)

Table 3: Variables Characteristics

Characteristics	Frequency (%)
Resource used (on campus/off campus)	
Yes	59 (12.1)
No	429 (87.9)
Visited food pantry	
Yes	31 (6.4)
No	457 (93.6)
<b>Barriers for accessing food resources</b>	
Social stigma	
Agree	376 (77.5)
Not agree	109 (22.5)
Not enough information	
Agree	381 (78.7)
Not agree	103 (21.3)
Hours of operations are inconvenient	
Agree	148 (30.6)
Not agree	336 (69.4)
Know about eligibility	
Agree	331 (68.2)
Not agree	154 (31.8)
Feeling like food pantry not for them	
Agree	315 (65.2)
Not agree	168 (34.8)
Food options not great	
Agree	147 (30.4)
Not agree	337 (69.6)
<b>Food Insecurity: Dependent Variables</b>	
Hungry at class	
Food secure	363 (74.2)
Food insecure	124 (25.4)
Nutritious meals	
Food secure	309 (63.2)
Food insecure	180 (36.8)
Fruits and Veggies	
Food secure	288 (58.9)
Food insecure	201 (41.1)

Table 4: Chi-Square Analysis

Variables	Hungry at class			Nutritious meals			Fruits and veggies		
		df	sig		Df	Sig		df	sig
GPA	5.406	2	.067	27.183	2	<.001	14.472	2	<.001
College years	5.659	5	.341	9.819	5	.081	9.582	5	.088
Gender	5.409	1	.020	4.711	1	.030	.036	1	.850
Race	9.387	5	.095	17.431	5	.004	10.431	5	.064
Ethnicity	1.482	2	.477	10.322	2	.006	1.814	2	.404
SES	7.948	2	.019	9.917	2	.007	6.490	2	.039
Resource used	.921	1	.337	2.272	1	.132	1.163	1	.281
Food pantry visit	.601	1	.438	3.084	1	.079	.216	1	.642
Risk Factors									
Stigma	.347	1	.556	.638	1	.425	4.709	1	.030
Information not enough	.308	1	.579	.090	1	.764	.601	1	.438
Inconvenient operation hours	.099	1	.753	.681	1	.409	2.871	1	.090
Know about eligibility	2.502	1	.114	.054	1	.816	1.051	1	.305
Feeling like food pantry not for them	.412	1	.521	.601	1	.438	.223	1	.637
Food options not great	.360	1	.549	.291	1	.590	.205	1	.651
Protective Factors									
Greek Life	14.578	1	<.001	.844	1	.358	.034	1	.855
Varsity athlete	3.238	1	.072	.064	1	.801	2.136	1	.144
Living or learning community	1.518	1	.218	1.621	1	.203	.800	1	.371
Academic club	.705	1	.401	.128	1	.721	4.196	1	.041
Social club	2.434	1	.119	.513	1	.474	2.240	1	.134