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Laura Aldama laldama@students.llu.edu

Holly Lai-Eschen hlaieschen@students.llu.edu

Hannah Nua hnua@students.llu.edu

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## LOMA LINDA UNIVERSITY

School of Allied Health Professions

Department of Nutrition and Dietetics

## FOOD INSECURITY ON LLU CAMPUS AND THE AWARENESS OF RESOURCES

## AVAILABLE

By

Laura Aldama

Holly Lai-Eschen

Hannah Nua

**Gurinder Bains** 

Lida Gharibvand

Cindy Kosch

JUNE 2021

## ABSTRACT

*Background:* The prevalence of food insecurity (FI) on college campuses in the United States was 41% in 2018. However, most studies focus on undergraduate students on public college campuses. Food insecurity has been shown to lead to poor sleep, higher BMI, worse academic outcomes, poor mental health, less physical activity, and the consumption of less fruits and vegetables than their food secure peers.

*Objective:* The purpose of this graduate student research study was to determine the prevalence of food insecurity among students at LLU (a private and predominately graduate university) and their awareness of local food resources.

*Methods:* Emails were sent to the eight schools of current Loma Linda University students with a request for them to complete an anonymous survey (Qualtrics). Out of the 5,000 possible participants, 239 students from seven schools, ages 18-59, participated in the survey. Participants answered 21 multiple choice questions, 4 free response questions, and 2 Likert scale response questions that took approximately 5-10 minutes to complete.

*Results*: According to the USDA's US Food Security Survey Module: Six Item-Short Form, 61.09% of participants were categorized as having "high food security," 17.15% were categorized as having "low food security," and 21.76% were categorized as having "very low food security." Chi square test of independence showed a significant association between Food Security Survey Score and variables BMI, race, highest obtained degree, and annual income (P=0.002, P=0.002, P=0.011, P=0.004, respectively). One way ANOVA showed significant differences in GPA among different survey scores (p=0.031) and post hoc (LSD) test showed participants with "very low food security" had significantly lower GPAs than participants with "high food security." Students were asked to prioritize their personal spending and ranked the categories from 1 to 7 (housing, tuition, food, clothes, transportation, personal spending, and other). Many of the students reported their highest three priorities were housing, tuition, and food, respectively. The two lowest prioritized in their budget, 30% of the students ranked food as their number one spending priority, 31% ranked food as their second priority, 24% of students ranked food as their third priority, and no students ranked food as their sixth or seventh priority.

*Conclusion:* The findings our research highlight both the prevalence of food insecurity and the awareness of food resources in the LLU student population, which reveals the need to address FI to maximize whole person care. Some strategies to address FI on the LLU campus include increasing communication of resources available, implementing food resources on campus (e.g. campus food bank, cafeteria meal plan, etc.) allocating additional resources, and increasing the weight of the issue.

#### Introduction

Food insecurity (FI) is the lack of consistent access to nutritionally adequate and safe food to support a healthy, active lifestyle, or the inability to acquire those foods in a socially acceptable manner. The United States Department of Agriculture (USDA) addresses this issue by using four categories of measured food security: High food security, marginal food security, low food security, very low food security. High food security is characterized by "no reported indications of food-access problems or limitations" and marginal food security is characterized by "one or two reported indications—typically of anxiety over food sufficiency or shortage of food in the house—with little or no indication of changes in diets or food intake." Low food security is characterized by "experiencing reduced quality, variety, or desirability of diet with little or no indication of reduced food intake," and very low food security is characterized by "experiencing multiple indications of disrupted eating patterns and reduced food intake." People who are categorized as having high or marginal levels of food security are considered "food secure," while people who are categorized as having low or very low levels of food security are considered "food insecure."

In 2018, 11.1% of households in the United States were considered food insecure at some point during the year.<sup>1</sup> While the prevalence of household FI has decreased from its peak FI status of 14.9% in 2011, FI at universities remains a pressing issue.<sup>14</sup> In fact, it is estimated that 41% of students attending US colleges are food insecure.<sup>2</sup> In recent years, college education has become more inclusive; it is no longer considered an opportunity solely for the young, financially privileged. Rather, universities are now welcoming students from

more diverse age groups, ethnic backgrounds, and financial levels, all of which have been shown to be risk factors for food insecurity.<sup>5,6</sup>

FI has been related to many negative physical outcomes in the university student population.<sup>462</sup> One study conducted by Martinez et al. looked at the effects of FI in students enrolled in the University of California school system and found that FI was both directly and indirectly related to higher Body Mass Index (BMI) and poor health because FI led to more days of poor sleep, fewer days of physical activity, and consumption of fewer servings of fruits and vegetables.<sup>6</sup> A study conducted at the University of Michigan corroborated these results, adding that compared to students with high food security, those with low food security exhibited higher intakes of total added sugar and added sugar from sugar-sweetened beverages.<sup>6</sup> In addition, another study by Bruening M., et al on the health outcomes of a diverse group of college freshmen living on campus found the FI was also associated with alcohol use.<sup>9</sup>

In addition to negative physical outcomes, FI has been related to poor mental health, including an increased prevalence of depression and anxiety.<sup>10,11</sup> A qualitative study conducted by\_Meza et al. investigating the effects of FI on university student's psychosocial health found seven common themes among students with FI: "1) the stress of food insecurity interfering with daily life, 2) fear of disappointing their family, 3) jealousy or resentment of students in more stable food and financial situations, 4) inability to develop meaningful social relationships, 5) sadness from reflecting on food insecurity, 6) feeling hopeless or undeserving of help, and 7) frustration and anger directed toward the academic institution for not providing enough resources to support students."<sup>11</sup> In turn, the increased mental strain on students resulting from FI has been shown to affect grade point averages (GPA),

with students afflicted with FI having significantly lower GPA than their food secure peers."<sup>7,10,11</sup>

Based on <sup>12</sup> However, food assistance programs such as Supplemental Nutrition Assistance Program (SNAP) are not extended to university students if they are not claimed as dependents by their parents. Researchers of this issue suggest that SNAP be extended to nondependent university students due to the high rates of food insecurity experienced among this population.<sup>13</sup> Moreover, it was suggested that SNAP be amended to include international students as well.<sup>13</sup> Food pantries are another intervention implemented by many college campuses where students can receive free food to prepare meals. According to The College and University Food Bank Alliance, 640 food pantries on U.S. college campuses were recorded in 2018.<sup>13</sup> Pantries are relatively inexpensive to implement on campuses because fundraising, donations, and volunteers can be utilized to operate the pantry, making them a viable intervention option.

Meal vouchers are another way that universities offer free or subsidized meals to students. Swipe Out Hunger is a non-profit organization that partners with university campuses to supply free or subsidized meals to students. However, in one study conducted in a university system in the southeast United States found that there was no significant relationship found between FI and meal plan participation.<sup>14</sup>

Nutrition education has also been found to play a role in preventing food insecurity. In a study<sup>15</sup> on FI among university students in Greece, participants were allocated into two groups: dietetics students (n=103) and non-dietetics students (n=133). FI was found to be less prevalent among the dietetics students. The researchers propose that the low prevalence of FI among this group was due to the nutrition knowledge they possess. Therefore, nutrition education may be considered as an intervention method in addition to the interventions stated above.

Despite the efforts to help prevent FI among college students, there continues to be an overwhelming FI status on university campuses. As college tuition continues to rise, many students experience economic hardships and financial stress.<sup>4</sup> Food insecure students face many social and economic barriers which relate to their overall health and well-being.<sup>46</sup> The food insecure students are more likely to receive financial aid, have a job while taking classes, and more likely to not to live with family.<sup>4</sup> Resources are available to students such as meal plans and food pantries at some campuses, however, students are still not taking advantage of the available resources. In a study conducted by El Zein et al. it was found that among food insecure students a main barrier to seeking help was social stigma and embarrassment if seen visiting the food pantry on campus.<sup>4</sup> Some other issues reported were insufficient hours of the food pantry (e.g. conflicting with class schedule, work, etc.), fear of taking resources of those who need it more, not understanding how the food pantry works (e.g. eligibility, location, expectation for finances, etc.), and fear of judgment.<sup>4</sup>

To address potential negative outcomes among students, Loma Linda University (LLU) places an emphasis on health and wellness. According to the 2019-20 LLU catalog, LLU is, "...a Seventh-day Adventist Christian, health sciences institution— [that] seeks to further the teaching and healing ministry of Jesus Christ to make man whole." The central theme throughout a student's academic experience at LLU is the concept of "wholeness," which is the basis of the university's motto. According to LLU, wholeness is defined as a, "...lifelong, harmonious development of the physical, intellectual, emotional, relational, cultural, and spiritual dimensions of a person's life..." One way that LLU accomplishes its mission is by guiding students toward whole person health by helping them develop a balanced spiritual, social, physical, and mental health. LLU does this by hosting weekly chapel services, offering

mental health resources, promoting social events, and providing recreational centers. Nutrition also plays an essential role in promoting whole person health, and free food is sometimes offered to students at events to achieve this goal. Students also have access to dining facilities on campus, and kitchens are available to residents of dormitories and student apartments. However, this does not assure that all students are food secure and whether students who are food insecure have their needs met. Therefore, the purpose of this graduate student research study was to determine the prevalence of food insecurity among LLU students and their awareness of local food resources.

## Subjects

The study recruited 239 participants of all genders from Loma Linda University in California via email to participate in the study. Inclusion criteria required that the subjects be 18 years or older, currently enrolled as an LLU student, which covers students enrolled in either full-time or part-time status, with classes on campus, online, or a combination of the two in any school at the university and live either on or off campus. There were no exclusion criteria for this study. All methods and procedures were approved by the Loma Linda University Institutional Review Board.

## Methods

We recommended that approximately 5,000 information letters be sent, via email, to all eight schools of current Loma Linda University students with a request for them to complete an anonymous survey (Qualtrics). The first section of the survey collected demographic information such as age, gender, county residence, GPA, financial aid status, etc. The second part of the survey was the USDA U.S. Household Food Security

Survey Module: Six Item Short Form, developed by researchers from the National Center for Health Statistics. The survey was designed to identify households that experience food insecurity. Compared to the 10 item U.S. Household Food Security Survey Module, the Six Item Short Form has a high specificity and sensitivity with minimal bias. Questions inquired about behaviors and experiences related to insufficient food resources over the past 12 months prior to the corona virus pandemic and determined the student's food security status per the USDA defined food security categories: food secure and moderately food secure (score of 0-1), low food security (score of 2-4), and very low food security (score of 5-6). Qualitative results were stratified for responses from students who qualified as food insecure (scores of 2 or higher) in accordance with the USDA U.S. Household Food Security Survey Module: Six Item Short Form. Examples of questions are listed below:

- Do you know where to get food at low or reduced cost either on or off campus?
  - If yes, what resources are you aware of?
- If Loma Linda University were to make food resources available, which would you find helpful?

#### Procedures

Students received an information letter via email, requesting their participation in an anonymous survey. To provide several opportunities to complete the survey, the information letter was emailed to students every two weeks over a two-month period. Consent to participate in the research study was given by clicking on the survey link. Participants answered 21 multiple choice questions, 4 free response questions, and 2 Likert scale response questions that took approximately 5-10 minutes to complete. Participants were asked to submit their responses, signifying completion of the survey.

#### **Data Analysis**

Descriptive statistics were used to analyze demographic information, and one sample ttest was used to analyze the U.S. Household Food Security Survey Module: Six Item-Short Form survey results. Mean and standard deviation were computed for continuous variables. Frequency (percentage) were computed for qualitative variables. The Chi-Square test of independence was used to determine if there was a significant association between the outcome variables with other categorical variables. One way ANOVA with applicable post hoc test (LSD) was used to determine significant differences in the survey score within the variable of GPA. Data were analyzed using SPSS Statistics Software version 27.0 (SPSS Inc, Chicago, IL, USA). All analyses were performed at an alpha level of 0.05.

#### Results

An anonymous online survey was sent out to seven out of the eight schools at the university, and received 239 participant responses. Of these participants, the ages ranged from 18-59; 14.9% had an associate's degree, 60.2% had a bachelor's degree, 12.9% had a master's degree, and 2.9% had a doctoral degree as their highest level of education. The age range of participants were 25 and below at 47.3%, the age range of 26-39 was 44.4%, and greater than 39 of participants were 7.5%. Most respondents were female at 77.6% and race consisted mostly of Asian, Hispanic/Latino, and White, which accounted for 86.3% of responses combined. A total of 70.5% of participants were reported to making less than \$20,000 a year and 10.4% reported to making between \$20,000 - \$34,999 per year. Participant demographics are shown in Table 1.

## Table 1. Mean (SD) and Frequency (%) of Demographic Variables

Variables	Frequency	%
<u>Height (inches)</u> <u>Weight (lb.)</u> <u>GPA</u>	$\begin{array}{c} 65.4 \pm 3.5 * \\ 157.3 \pm 41.2 * \\ 3.65 \pm 0.34 * \end{array}$	
Age (years) Less than 25 Between 26-39 Greater than 39	114 107 18	47.3 44.4 7.5
<u>Gender</u> Female Male Prefer not to answer	187 51 3	77.6 21.2 1.2
Race American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander Asian Black or African American Hispanic or Latino Prefer not to answer White	3 68 17 60 11 80	1.2 28.2 7.1 24.9 4.6 33.2
<u>Live with family</u> Yes No	110 129	45.6 53.5
How far reside from campus (miles) I live on campus <5 5-14 15-24 25-44 > 44	34 71 41 26 39 27	14.1 29.5 17.0 10.8 16.2 11.2
<u>Highest Degree Attained</u> Associate's Bachelor's Doctorate High School Diploma Master's	36 145 7 20 31	14.9 60.2 2.9 8.3 12.9

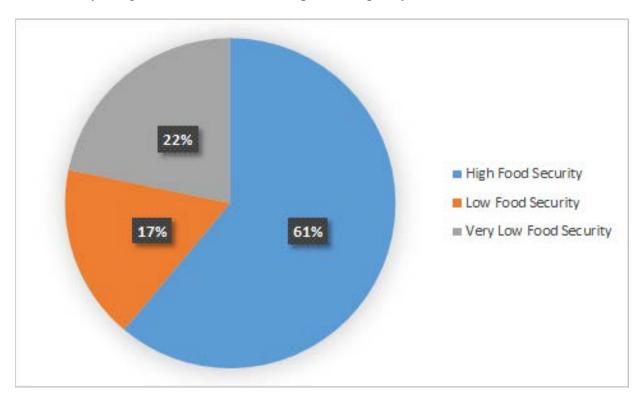
School Allied Health Professions Behavioral Health Medicine Nursing Pharmacy Public Health Religion Dentistry	89 33 27 67 20 1 2 0	36.9 13.7 11.2 27.8 8.3 0.4 0.8 0.0
Year in School 1st 2nd 3rd 4th 5th	48 105 51 26 8	19.9 43.6 21.2 10.8 3.3
<u>Annual Income</u> less than \$20,000 \$20,000-\$34,999 \$35,000-\$49,999 \$50,000-\$74,999 \$75,000 or more	170 25 2 21 20	70.5 10.4 0.8 8.7 8.3
BMI Less than 25 Between 25-29.9 Greater than 29.9	123 68 45	51.5 28.5 18.8

\*Mean  $\pm$  standard deviation

According to the USDA's U.S. Food Security Survey Module: Six Item-Short

Form, 61.09% of participants were categorized as having "high food security," 17.15% were

categorized as having "low food security," and 21.76% were categorized as having "very low



food security" (Figure 1). In total, 39% of respondents qualify as food insecure.

## **Figure 1. Percentage (%) of Food Security Survey Scores**

Chi square test of independence showed a statistically significant association between Food Security Survey Score and variables BMI, race, highest obtained degree, and annual income (P=0.002, P=0.002, P=0.011, P=0.004 respectively), as shown in Table 2.

Association with USDA Survey Score	P-Value
Age	0.847
Gender	0.941
BMI	0.002
Race	0.002
Address	0.188
Living with Family	0.581
How far from LLU	0.149
Highest Degree Attained	0.015

 Table 2. Significance of Food Security Survey Results to Demographic Variables (n=239)

School	0.461
Year in School	0.663
Annual Income	0.006

One way ANOVA showed significant differences in GPA among different survey scores (p=0.031) (Figure 2). Post hoc (LSD) showed participants with very low food security had significantly lower GPAs than participants with high food security.

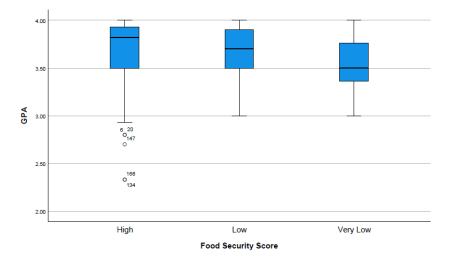


Figure 2. Distribution of survey scores within the variable GPA

Table 3 displays the frequency of priorities of student spending at Loma Linda University. Students were asked to rank seven categories of expenses by priority on a scale of 1 to 7 based on their personal spending habits. 1 being most priority and 7 being lowest priority. The seven categories were food, tuition, housing, clothes, transportation, personal, and other.

Responses showed that 29.86 % of participants ranked food as their top priority (1), 30.81% ranked food as their second highest priority (2), 24.17% ranked food as their third highest priority (3), 13.27% ranked food as their fourth highest priority (4), and 1.90% ranked food as their fifth highest spending priority (5). No participants reported food as their sixth (6) or

last (7) spending priority (Table 4). Many of the students reported their highest three priorities were housing, tuition, and food, respectively. The two lowest priorities were personal spending and other.

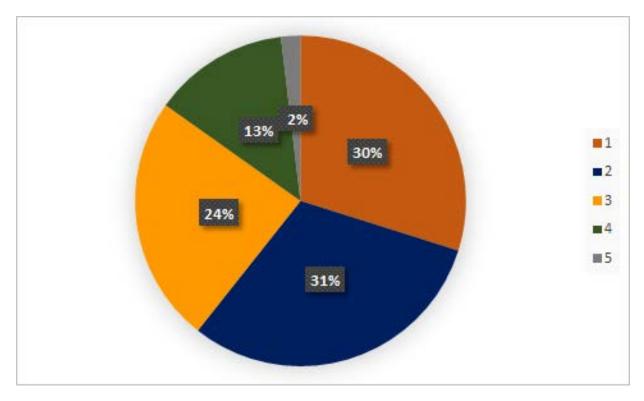
Table 4 in summary, shows most student's spending priorities are competing between housing and tuition when it comes to making financial decisions with food.

Enpendicules							
Priority Level	Food	Tuition	Housing	Clothes	Transportation	Personal	Other
Тор	29.9	33.2	33.7	0	3.3	0	0
2 <sup>nd</sup>	30.8	18.5	37.4	0.5	9.9	1.9	0.9
3 <sup>rd</sup>	24.2	19.9	17.5	6.2	27.5	4.3	0.5
4 <sup>th</sup>	13.3	16.6	6.2	15.2	41.7	4.7	2.4
5 <sup>th</sup>	1.9	6.6	2.4	41.7	12.3	22.3	12.8
6 <sup>th</sup>	0	3.3	1.4	29.4	4.3	55.0	6.6
Lowest	0	1.9	1.4	7.1	0.9	11.8	76.8

 Table 4. Percentage (%) in Priority Ranking of Loma Linda University Student

 Expenditures

Figure 3 represents the frequency at which students prioritized budgeting their money for food. When asked about food prioritization within their budget, 30% of the students ranked food as their number one spending priority, 31% ranked food as their second priority, 24% of students ranked food as their third priority, and no students ranked food as their sixth or seventh priority.



## Figure 3. Percentage (%) of Food Prioritization

In the anonymous survey, participants were asked questions regarding financial support and their awareness of available food resources on campus (Table 5). Participants were asked if they have another source of financial support, and to identify those sources (e.g. financial aid, family support, etc.). Top responses included: financial aid, family support, and loans and credit cards. Students were also asked if they knew where to obtain free or discounted food, and responses included: churches, food banks, and discounted grocery stores (e.g. Grocery Outlet, ALDI, 99 cents store, etc.) as helpful resources. Students responded that they are aware of food resources that they may utilize, however, none of the listed resources are available on campus, or offered by LLU. Students were then asked which food resources they would like to have on campus. A cafeteria meal plan, school food bank, and other suggestions were listed as resources that would be helpful for students experiencing FI.

## Table 5. Qualitative Survey Questions and Example Responses

Question	Example Responses
Do you have another source of financial support to help supplement what you have? (Financial aid, family support, etc.)	<ul> <li>"Family, but I feel embarrassed to ask because they are also struggling."</li> <li>"Endowment that pays for me now and expects me to pay for a future student."</li> <li>Financial Aid</li> <li>Loans and Credit Cards</li> </ul>
Do you know where to get food at a low or reduced cost? If yes, list below (list the cost/source you are aware of)? If yes, have you used them?	<ul> <li>"My child and I are part of a food assistance program along with cash aid and childcare. I used resources from my previous college to ensure my child was always fed a well-balanced diet. There is a community cupboard locally, although I have not used it yet. My child's daycare also provided her with two meals and two snacks per day when she attended (usually four days a week)."</li> <li>99 cents store</li> <li>Grocery Outlet</li> </ul>
If LLU were to make food resources available, which would you find helpful? Check the list: food bank, subsidized groceries, cafeteria meal plan options, cafeteria meal vouchers, school garden, other.	<ul> <li>Cafeteria meal plan and vouchers</li> <li>School food bank</li> <li>Subsidized groceries</li> </ul>

## Discussion

The purpose of this research was to determine the prevalence of food insecurity among LLU students and their awareness of local food resources. Several studies have shown FI prevalence among U.S. college students, however, these were mostly conducted on public university campuses and in undergraduate populations. The present study is the first to our knowledge that suggests students working towards higher education degrees, such as masters and doctoral students, as well as students attending private universities experience a similar level of

FI.

The percentage of food insecure students at LLU (38.9%) is slightly below the national average (41%), possibly because of the emphasis on "wholeness" practices, which students might adopt during their time at LLU.<sup>1</sup> Additionally, the significant association between survey score with highest degree earned, annual income, race, and BMI may indicate that food insecurity is influenced by these factors. No significance was found between survey score and those living with family, possibly because these students have more financial support from family members. No significance was found between age and survey score. This may be because at graduate universities, although students are older, they likely have additional financial responsibilities such as loan payments from a previous degree. Students may also be working less due to the high demands of their program.

Poorer academic outcomes are a well-documented association of FI among published literature, which our study corroborates.<sup>7,10</sup> Previous studies have also shown that students experiencing FI have a lower GPA than those who are food secure, which is consistent with the GPA of LLU students experiencing very low FL<sup>10,11</sup> The inability to obtain adequate nutrition can greatly impact the psychosocial health of students, ultimately resulting in low GPA. In addition, the stress related to attaining food may impact a student's ability to focus academically. In order to obtain food, students may need to spend their time working instead of studying, limiting their ability to study as efficiently as food secure peers. Additionally, several public universities across the U.S. offer food assistance resources or meal plans to their students, however, LLU, as a predominantly graduate school, does not admit true undergraduate freshman, and are therefore not required to offer a meal plan to students. Although there are several low-cost food programs and food assistance programs on LLU campus, students were not able to identify any, perhaps in part due to lack of advertising.

## Strengths

This study included several strengths. The first strength was the use of a mixed methodology in collecting data. Participants were asked both quantitative and qualitative questions in order to not only determine the prevalence of food insecurity, but also possible themes surrounding what may be causing it. In addition, this study utilized a validated survey to collect data about the prevalence of food insecurity (USDA's U.S. Household Food Security Survey Module: Six Item-Short Form), which allowed us to collect reliable and accurate information.

## Limitations

However, this study was not without limitations. The first limitation was the small sample size relative to the entire student population at the university. Additionally, since the study was conducted on a private university campus in southern California, these results may not be generalizable to all graduate universities across the country.

## Conflicts of Interest

The authors state no conflicts of interest, financial or otherwise.

## Future studies

Future studies should consider looking at the effects of interventions, such as addition of resources or education to increase awareness of resources, to help lower the rate of food insecurity on university campuses.

## Conclusion

The findings of our study may be useful to public health officials and dietitians by presenting the issue of FI in students beyond the undergraduate level of education as well as students on private university campuses. As discussed earlier, FI is associated with negative physical, mental, social, and academic outcomes, which may be noteworthy to school officials. Therefore, the findings of our research highlight both the prevalence of food insecurity and the awareness of food resources in the LLU student population, which reveals the need to address FI to maximize whole person care. Some strategies to address FI on the LLU campus include increasing communication of resources available, implementing food resources on campus (e.g. campus food bank, cafeteria meal plan, etc.) allocating additional resources, and increasing the weight of the issue.

## References

 Coleman-Jensen APR, Matthew; A. Gregory, Christin; Singh, Anita. Household Food Security in the United States in 2018. In Published 2019. Accessed April 15, 2020. Published 2019. Accessed April 15, 2020.

2. Nikolaus CJ, An R, Ellison B, Nickols-Richardson SM. Food Insecurity among College Students in the United States: A Scoping Review. Adv Nutr. 2020;11(2):327-348.

3. Adamovic E, Newton P, House V. Food insecurity on a college campus: Prevalence, determinants, and solutions. J Am Coll Health. 2020:1-7.

4. El Zein A, Shelnutt KP, Colby S, et al. Prevalence and correlates of food insecurity amongU.S. college students: a multi-institutional study. BMC Public Health. 2019;19(1):660.

5. El Zein A, Mathews AE, House L, Shelnutt KP. Why Are Hungry College Students Not Seeking Help? Predictors of and Barriers to Using an On-Campus Food Pantry. Nutrients. 2018;10(9).

6. Martinez SM, Grandner MA, Nazmi A, Canedo ER, Ritchie LD. Pathways from Food Insecurity to Health Outcomes among California University Students. Nutrients. 2019;11(6).

7. Bruening M, Argo K, Payne-Sturges D, Laska MN. The Struggle Is Real: A Systematic Review of Food Insecurity on Postsecondary Education Campuses. J Acad Nutr Diet. 2017;117(11):1767-1791.

Leung CW, Wolfson JA, Lahne J, Barry MR, Kasper N, Cohen AJ. Associations between
 Food Security Status and Diet-Related Outcomes among Students at a Large, Public Midwestern
 University. J Acad Nutr Diet. 2019;119(10):1623-1631.

9. Bruening M, van Woerden I, Todd M, Laska MN. Hungry to learn: the prevalence and effects of food insecurity on health behaviors and outcomes over time among a diverse sample of university freshmen. Int J Behav Nutr Phys Act. 2018;15(1):9.

10. Raskind IG, Haardorfer R, Berg CJ. Food insecurity, psychosocial health and academic performance among college and university students in Georgia, USA. Public Health Nutr. 2019;22(3):476-485.

11. Meza A, Altman E, Martinez S, Leung CW. "It's a Feeling That One Is Not Worth Food": A Qualitative Study Exploring the Psychosocial Experience and Academic Consequences of Food Insecurity Among College Students. J Acad Nutr Diet. 2019;119(10):1713-1721 e1711.

12. SNAP Eligibility. USDA. 🕮. Accessed April 21, 2020. Accessed April 21, 2020.

13. Freudenberg N, Goldrick-Rab S, Poppendieck J. College Students and SNAP: The New Face of Food Insecurity in the United States. Am J Public Health. 2019;109(12):1652-1658.

14. Wooten R, Spence M, Colby S, Anderson Steeves E. Assessing food insecurity prevalence and associated factors among college students enrolled in a university in the Southeast USA. Public Health Nutr. 2018:1-8.

15. Theodoridis X, Grammatikopoulou MG, Gkiouras K, et al. Food insecurity and Mediterranean diet adherence among Greek university students. Nutr Metab Cardiovasc Dis. 2018;28(5):477-485.

16. Bruening M, Brennhofer S, van Woerden I, Todd M, Laska M. Factors Related to the High Rates of Food Insecurity among Diverse, Urban College Freshmen. J Acad Nutr Diet. 2016;116(9):1450-1457.

## Appendix A

## **Survey Questionnaire**



#### Q1. What is your age?

- 0 18-20
- 0 21-25
- 26-29
- 0 30-39
- 0 40-49
- 0 50-59
- 60 or older

#### Q2. What is your gender?

- O Male
- Female
- Prefer not to answer

#### Q3. Which is your race?

- O White
- O Black or African American
- O American Indian or Alaska Native
- Asian
- Native Hawaiian or Other Pacific Islander
- O Hispanic or Latino
- Prefer not to answer

#### Q4. What is your height (feet/inches)?

Q5. What is your weight? (lbs)

Q6. In which state and county is your permanent address located?

#### Q7. Do you live with your family?

O Yes

🔘 No

#### Q8. How far from campus do you live?

- I live on campus
- Less than 5 miles
- 5-14 miles
- 15-24 miles
- 25-34 miles
- 35-44 miles
- 45-54 miles
- more than 55 miles

#### Q9. What is the highest degree you have completed?

- High School Diploma
- Associate's Degree
- Bachelor's Degree
- O Master's Degree
- Doctorate Degree

#### Q10. In which school are you enrolled?

- School of Allied Health Professions
- School of Behavioral Health
- School of Dentistry
- School of Medicine
- School of Nursing
- School of Pharmacy
- School of Public Health
- School of Religion

#### Q11. What year in your program are you currently in?

- 1st year
- 2nd year
- 3rd year
- 4th year
- 5th year

#### Q12. What is your current cumulative GPA?

#### Q13. What is your annual income?

- Less than \$20,000
- \$20,000-\$34,999
- \$35,000-\$49,999
- \$50,000-\$74,999
- \$75,000 or more

#### Q14. In the past 12 months, before the COVID-19 pandemic, answer the following statements...

#### Q15. The food I bought just didn't last, and I didn't have money to get more.

- Often true
- Sometimes true
- Never true
- On't know

#### Q16. I couldn't afford to eat balanced meals.

- Often true
- Sometimes true
- Never true
- On't know

## Q17. In the last 12 months, did you ever cut the size of your meals or skip meals because there wasn't enough money for food?

- O Yes
- O No
- O Don't know

#### Q17a. How often did this happen?

- Almost every month
- Some months but not every month
- Only 1 or 2 months
- Don't know

## Q18. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?

- O Yes
- · · ·
- 🔘 No
- On't know

#### Q19. In the last 12 months, were you ever hungry but didn't eat because there wasn't enough money for

food? Yes

- O No
- ....
- On't know

#### Q20. Is your personal income sufficient to supply your daily food needs?

O Yes

O No

## *Q20a.* Do you have another source of financial support to help supplement what you have (financial aid, family support, etc.)?

O Yes

🔘 No

#### Q20b. What are the other sources of financial support that help supplement what you have?

Q21. Rank the categories below from 1-7 (1=highest priority;7=lowest priority).

- Food
- Tuition
- Housing
- Clothes
- Transportation
- Personal Spending
- Other

#### Q22. Do you know where to get food at a low or reduced cost?

O Yes

#### O No

#### Q22b. Have you utilized those low cost resources?

- O Yes
- 🔿 No

#### Q23. If LLU were to make food resources available, which would you find helpful?

#### Food bank

- Subsidized groceries
- Cafeteria meal plan options
- Cafeteria meal vouchers
- School Garden
- Other