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# Using a Mobile Food Pantry to Address the Food Insecurity Needs of College Students

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*Food insecurity is a prevalent issue throughout the United States, the state of Oklahoma, and on Oklahoma State University's (OSU) Stillwater campus. Research has shown that college and university students tend to be more food insecure than national population averages and Stillwater's food insecurity rates have been even higher. Mobile food pantries (MFP) generally have been effective in addressing food insecurity, but few studies have investigated their use to alleviate food insecurity among college students. Our Daily Bread Food and Resource Center (ODB) in Stillwater implemented an MFP on OSU's campus. The present study surveyed students who utilized the MFP to assess their needs, food security status, and perceptions of the MFP. Of 130 students who answered the food security questions (after receiving their food), more than 83% were classified as food insecure. Respondents agreed that the MFP provided sufficient foods considering nutritional value, variety, diversity, and acceptability. Students were mostly unaware of available food assistance programs but were open to using them. Almost one-third of students reported no grocery or market within walking distance of their residence. Overall, the findings of this study showed a need for an MFP on OSU's campus.*

*Keywords:* food insecurity, food access, college, university, students, food pantries, mobile food pantries, hunger

## **Introduction**

The United States Department of Agriculture (USDA) Economic Research Service (ERS) defines food insecurity as “a lack of consistent access to enough food for an active, healthy lifestyle” (2020, para. 4). Food insecurity is a worldwide problem and prevalent in Oklahoma and on Oklahoma State University's (OSU) campus in Stillwater, Oklahoma. Food is one of the most basic needs for human survival (Maslow, 1943). In 2018, 14.3 million United States (US) households were food insecure, meaning they had unreliable access to sufficient foods to maintain active and healthy lifestyles (Coleman-Jensen et al., 2020). Oklahoma's food insecurity rates are higher than average compared to other states of the United States. Fifteen percent of the

population is food insecure in both the state of Oklahoma and Payne County (Feeding America, 2021). Lack of money and ineligibility for specific governmental support systems make college students even more vulnerable to food insecurity (Bruening et al., 2016; El Zein et al., 2018). The US Government Accountability Office (GAO) estimates food insecurity rates of more than 30% among US college students (GAO, 2018).

Two studies in the past five years have revealed the prevalence of food insecurity among students on the OSU campus. Weaver (2020) found that 51.8% of the students surveyed were considered to have low or very low food security. Balsiger's (2018) assessment of food security on OSU's campus found that 42.0% of his participants were food insecure. These findings emphasize the relevancy of research and the need for policies to address this challenge.

Food insecurity causes many issues, both physical and psychological. Some consequences of food insecurity include hunger, malnutrition, increased risk of obesity and chronic diseases, lower academic performance, and increased problems with mental health (Bruening et al., 2016; Goldrick-Rab et al., 2018). Such risks hinder college students from reaching their full potential academically, socially, and personally.

Federally funded assistance or entitlement programs offered by the US government to its citizens are a way to mitigate food insecurity. These include programs such as the Supplemental Nutrition Assistance Program (SNAP); the Women, Infants, and Children (WIC) program; and the Food Distribution Program on Indian Reservations (FDPIR) (USDA, 2021). These programs are designed to serve all US citizens in need, but college students face distinct barriers to receiving benefits. Strict work and financial requirements make it more difficult for college students to apply and qualify for such programs (Blagg et al., 2017; Broton & Goldrick-Rab, 2017). In addition, a social stigma exists around college students using these types of assistance programs. Most students eligible for governmental benefits or who have access to non-governmental programs do not use these resources (Bailey-Davis et al., 2013; Bedore et al., 2016; Kaiser et al., 2007).

A common response to the issue of addressing food insecurity is the use of food pantries. Food pantries are typically non-governmental operations dedicated to reducing food insecurity within communities. Our Daily Bread Food and Resource Center of Stillwater, usually referred to as Our Daily Bread (ODB), serves the citizens of Payne County as a supplemental food access program by providing free food to individuals and households in need. However, lack of accessibility remains a contributing factor to food insecurity (Penchansky & Thomas, 1981). As such, some food pantries use mobile food pantries (MFP) to provide greater access to foods in a convenient way for their clients. ODB implemented a MFP on OSU's campus to address the food needs of university students. This study describes the perceptions of student clients who used the ODB MFP.

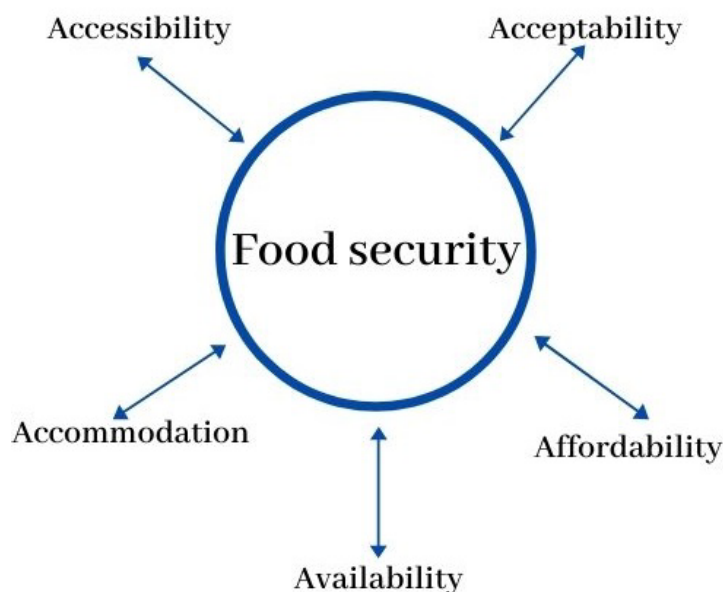
## Theoretical Framework

This study was guided by the five dimensions of access (Penchansky & Thomas, 1981) and Maslow's (1943) initial hierarchical needs theories. Each theory supported the understanding of basic human needs and the factors contributing to OSU students' food access in relation to food insecurity.

### Five Dimensions of Access

Penchansky and Thomas (1981) introduced the concept of five dimensions of access as a measurement tool for healthcare systems. The five dimensions of access are 1) acceptability, 2) accessibility, 3) accommodating, 4) affordability, and 5) availability. Caspi et al. (2012) modified the theory to fit their purpose of using it to measure access to food. The modified framework has been used by other scholars for a similar purpose (Andress & Fitch; Flint et al., 2013). A concept map of the Five Dimensions of Access in relation to food security is depicted in Figure 1. For an individual to be considered food secure, all five dimensions of access must be met.

*Figure 1. Five Dimensions of Access in Relation to Food Security*



*Acceptability* is “people’s attitudes about attributes of their local food environment, and whether or not the given supply of products meets their personal standards (i.e., personal and cultural preferences)” (Caspi et al., 2012, p. 1173). *Accessibility* builds on the dimension of availability with the addition of geographic location. Caspi et al. (2012) said, “[accessibility] refers to the location of the food supply and ease of getting to that location. Travel time and distance are key measures of accessibility” (p. 1173). *Accommodating* is the convenience of the food distribution sources and their products to customers. Accommodating could include factors such as hours of

operation, types of payments accepted, as well as safety and comfort of the infrastructure (Caspi et al., 2012). *Affordability* measures the prices of food and the local consumer's ability to pay for the items. *Availability* is the "adequacy of the supply of healthy food" (Caspi et al., 2012, p.1173); it points to the number of markets or stores from which people can obtain food as well as how many nutritious foods are in stock and available to receive at those locations.

### **Maslow's Hierarchical Needs**

Maslow (1943) suggested that a hierarchy of basic needs exists for human survival and self-fulfillment: 1) physiological, 2) safety, 3) love and belonging, 4) esteem, and 5) self-actualization. The theory states that these needs exist in an ascendant hierarchal form, and the upper tiers can only be achieved by first fulfilling the needs below. Food is a physiological need and, therefore, a basic need that precedes all other needs in the hierarchy. Without first satisfying every human's requirement for food, the needs to achieve safety and successively reach self-actualization cannot be fully met (Maslow, 1943).

### **Purpose and Objectives**

Food insecurity on college campuses has recently received increased attention, but research surrounding the topic is still not plentiful. Studies regarding the role of MFPs in reducing food insecurity are extremely limited, particularly on the development of MFPs to address the needs of food-insecure college students. University administrators and providers of food assistance programs such as food pantries and MFPs need to understand the status, needs, and perceptions of target populations to achieve their goals and best serve potential clients.

By purposefully selecting OSU students who used the ODB MFP, this study aimed to 1) estimate the degree of food insecurity among students utilizing the ODB MFP and 2) identify perceptions, interests, and needs of OSU students using the ODB MFP regarding the five dimensions of access (Penchasky & Thomas, 1981). The results of this study will help the staff and MFP managers at ODB to better address the issues of food access and food insecurity among college students, specifically at OSU, and perhaps have implications for similar food providers and other institutions of higher education.

### **Methods**

A purposive, non-probability sampling method was used to conduct this study. The researcher distributed a questionnaire to OSU students who used the ODB MFP during the Fall 2020 semester of the school year. Students were encouraged to complete the survey questionnaire, but it was not a condition to receive the benefits of the ODB MFP, meaning the method type was both voluntary and convenient (Johnson & Christensen, 2017).

A total of 363 student clients used the MFP throughout the semester. Some students visited the MFP on multiple occasions; however, they were only asked to complete the questionnaire during their first visit. Of these 363 visitors to the MFP during the semester, 197 QR codes were distributed, and 130 responses were completed and included in the study's data analysis ( $n = 130$ ).

## Participants

The participants in the study were obtained in a purposive way (Johnson & Christensen, 2017; Patton, 2002) based on specific characteristics. The characteristics of the study's participants included enrollment as undergraduate or graduate students of OSU, being 18 years of age or older, and utilizing the ODB MFP during the fall semester of 2020.

## Survey Questionnaire Development

The survey questionnaire was an adaptation of questions from several sources. A combination of close-ended and partially close-ended questions was employed to develop the questionnaire. The *U.S. Household Food Security Survey Module: Six-Item Short Form* was used to create questions to evaluate students' food security status (see Table 1; USDA ERS, 2020). This six-item instrument has been used in multiple studies to evaluate food security on college campuses (Martinez et al., 2017; Patton - Lopez et al., 2014). The questions were modified to specifically address the students' experiences "since being in college" rather than including the "past 12 months." This decision was made keeping freshman and nontraditional students in mind, who would not have been in college during the entirety of the 12 months preceding data collection. Questions in relation to the students' perceptions of the ODB MFP were developed based on the Caspi et al. (2012) adaptation of Penchansky's and Thomas' (1981) theory of the five dimensions of food access (i.e., acceptability, accessibility, accommodating, affordability, and availability). This portion of the instrument included 11 items, and each had prompts, such as "This mobile food pantry is in a location that is easily accessible to me," with a response scale ranging from *strongly agree* to *strongly disagree*. The remaining questions and response scales had options for specific locations and time periods that the MFP could be offered. The respondents were to choose which choices would be most convenient for them. Eleven questions about the students' personal characteristics also were included. The questionnaire was reviewed by a panel of four experts to establish face and content validity. The experts included the ODB Executive Director and OSU faculty members in the Department of Nutritional Sciences and the Department of Agricultural Economics. The survey questionnaire was revised based on recommendations from the panel of experts.

**Table 1. Questions Regarding Food Security Displayed to Individuals Taking the Survey Questionnaire**

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“The food that I bought just didn’t last, and I didn’t have enough money to get more. While attending college, is that often, sometimes, or never true?”

“I couldn’t afford to eat balanced meals. While attending college is that often, sometimes, or never true for you?”

“Since being at college, did you ever cut the size of your meals or skip meals because there wasn’t enough money for food?”

“Since being at college did you ever eat less than you felt you should because there wasn’t enough money for food?”

“While attending college, were you ever hungry but didn’t eat because there wasn’t enough money for food?”

“While at college, did you ever lose weight because there wasn’t enough money for food?”

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*Note.* These questions were a modification of the ERS USDA (2020) Six-Item Short Form Food Security Survey Module. The response scale for the first two questions was *often true, sometimes true, never true, or prefer not to respond*. All other questions had options of *yes, no, or prefer not to respond*.

### **Data Collection**

The survey questionnaire was entered into Qualtrics, an online design, distribution, analysis, and reporting software. A quick response (QR) code was generated that students could scan using their smartphones. The QR code provided a link to the survey questionnaire. Although this data collection method restricted response from students without cell phones or smartphones, it ensured proper COVID-19 protocols were followed and was a convenient and effective way to collect data.

The researcher distributed the QR codes at six ODB MFP events on the OSU campus. After each student had collected their food items, they were given the QR code and asked (but not required) to complete the questionnaire.

### **Data Analysis**

Descriptive statistics such as frequencies and percentages were computed using the Statistical Package for Social Sciences (SPSS) version 25. Students’ food security status was determined using the coding and scoring procedures developed by the USDA ERS (2020). The number of affirmative responses to the questions determines a person’s food security status. Zero affirmative responses indicate a *high food security* status. One affirmative response is classified as *marginal food security* status. Two, three, or four affirmative responses are considered *low food security* status, and five or six are classified as *very low food security* status. Further, the respondents were divided into groups of either “food secure” (high or marginal food security) or “food insecure” (low or very low food security). Students who did not answer all of the USDA ERS Food Security Survey questions were excluded from the analyses.

### Limitations of the Study

The survey questionnaire results do not reflect the food security status of the university as a whole or of all people who used the ODB MFP services on OSU's campus. The response rate to the questionnaire was 66.0%. Therefore, the generalizability of the study's findings is limited to the respondents. Also, it is important to note that the nature of the environment in which the questionnaires were distributed was more attractive to students needing food assistance. Furthermore, the students' responses were entirely self-reported; therefore, various respondents may have interpreted some questions differently.

### Findings/Results

#### Characteristics of the Population

As shown in Table 2, a majority of the respondents were 18 to 23 years of age (70.9%), female (60.9%), and of White non-Hispanic descent (47.2%). The largest proportion of students who completed the questionnaire were graduate students (28.0%), followed by freshmen at 26.4%. Fifty-six percent of the respondents resided on campus, and 44.1% lived off campus. The respondents' main mode of transportation to and from campus was walking or riding a bicycle (56.0%). Most of the respondents were not international students nor from out-of-state. Of the respondents, 31.2% were employed more than 20 hours per week.

**Table 2. Selected Characteristics of OSU Students Who Completed Questionnaires at the ODB MFP Sites (n = 125)**

	<i>f</i>	%
<b>Age</b>		
18 to 23	83	70.9
24 to 29	21	17.9
≥30	13	11.2
<b>Race/Ethnicity</b>		
White Non-Hispanic	59	47.2
American Indian or Alaska Native	7	5.6
Hispanic	16	12.8
African American or Black	9	7.2
Multi-Racial	5	4.0
Asian	3	2.4
Other	20	16.0
Did not respond	6	4.8
<b>Gender</b>		
Male	47	37.6
Female	76	60.8
Did not respond	2	1.6



	<i>f</i>	<i>%</i>
<b>Student Classification</b>		
Freshman	33	26.4
Sophomore	16	12.8
Junior	29	23.2
Senior	11	8.8
Graduate	35	28.0
Did not respond	1	0.8
<b>International Student Status</b>		
Yes	33	26.4
No	89	71.2
Did not respond	3	2.4
<b>Out-of-State Student</b>		
Yes	47	37.6
No	78	62.4
<b>Oklahoma State University College Affiliation</b>		
Ferguson College of Agriculture	18	14.4
Arts and Sciences	30	24.0
Engineering, Architecture, and Technology	28	22.4
Human Sciences, Education, Health, and Aviation	21	16.8
Business	18	14.4
University College	2	1.6
Did not respond	8	6.4
<b>Housing</b>		
On campus in residence hall or housing	70	56.0
Off-campus alone	16	12.8
Off-campus with roommates	29	23.2
Off-campus with parents/relatives	2	1.6
Off-campus with spouse/partner and children	5	4.0
Did not respond	3	2.4
<b>Employment</b>		
Not employed	34	27.2
< 20 hours/week	44	35.2
20 to 39 hours/week	34	27.2
40 or more hours/week	5	4.0
Did not respond	8	6.4
<b>Mode of Transportation</b>		
Walking or riding a bicycle	70	56.0
Driving	40	32.0
Bus system	15	12.0

### Food Security of the Respondents

Of the OSU student respondents, 83.8% were food insecure compared to 16.2% who were food secure (see Table 3). Eighty percent of students responded that while attending college, it was *sometimes* or *often* true that their food did not last, and they lacked the money to buy more. Moreover, 81.5% of respondents reported that they could not afford to eat balanced meals while attending college, either *often* or *sometimes*. A high number of students (60.7%) responded that they had cut the size of or skipped meals since attending college because they did not have enough money for food. Of the students who had reduced meal sizes or skipped meals, 44.5% indicated that they did so almost every month, 37.0% said they cut their meals some months, and 13.6% said they limited their meals or meal sizes only during one or two months. Many students responded *yes* to eating less than they felt they should (59.7%) and having been hungry but not eating (48.5%) because they lacked enough money for food. In addition, 32.0% of respondents indicated that they had lost weight due to not having enough money for food. Most respondents (70.2%) were either *somewhat* or *moderately confident* that they would be able to afford the food they needed for the next four weeks, 18.3% were *very confident*, and 7.6% were *not at all confident*.

**Table 3. Food Security Status of OSU Students Using a Campus Mobile Food Pantry (n = 130)**

Number of Affirmative Responses	Food Security Status According to Affirmative Responses	Determined Food Security Status	f	%
Zero	High food Security	Food secure	13	10.0
One	Marginal food security	Food secure	8	6.1
Two	Low food security	Food insecure	23	17.7
Three	Low food security	Food insecure	9	6.9
Four	Low food security	Food insecure	17	13.1
Five	Very low food security	Food insecure	13	10.0
Six	Very low food security	Food insecure	47	36.2

*Note.* Students' food security status was determined using the coding and scoring procedures developed by the USDA ERS (2020). No affirmative responses = *High Food Security* status, one affirmative response = *Marginal Food Security* status, and two to four affirmative responses = *Low Food Security*. Five or six affirmation responses = *Very Low Food Security*.

### Awareness and Perceptions of the ODB MFP

More than one-half of the students (55.7%) who used the MFP reported that they became aware of the MFP from another student or person at OSU. One-fourth of respondents became aware of the MFP via advertisements and promotional pieces. Regarding the general services offered by ODB at their permanent location in Stillwater, 44.3% of students were unaware of such, and 74.0% had never received food from the ODB facility. When asked how likely they were to use the ODB mobile food pantry in the future, 71.8% indicated that they were *extremely likely*, 25.2% said *somewhat likely*, and 3.0% indicated *somewhat unlikely*. More than nine of 10

(95.3%) respondents agreed that the MFP provided food options that otherwise would not be easily available to them.

Nearly all (96.8%) students *agreed* or *strongly agreed* that the ODB MFP was easily accessible to them. A central campus location was preferred by 30.7%.

Afternoon (1 p.m. – 4 p.m.) and evening (4 p.m. – 7 p.m.) were the most popular choices of convenient times for the MFP to be open. Nearly all (96.0%) of the student clients agreed that it was easy to understand how the MFP worked. Although a large majority (69.1%) of students *agreed* or *strongly agreed* that a grocery store or food market was within reasonable walking distance from their place of residence, almost one-third either *disagreed* or *strongly disagreed* with the statement.

### Conclusions and Implications

The results of this study confirmed the existence of food insecurity among OSU students and the need for a MFP on OSU's campus. Caspi et al. (2012) asserted that part of accessibility and accommodation was ease of use. Nearly all of the study's participants either *strongly agreed* or *agreed* that it was easy to understand how the MFP operated. Almost one-half of the students indicated that either afternoon or evening times would be the most convenient time for ODB to provide the MFP. These times are near the end of the typical workday or class schedule when most students would have time to stop by a MFP on campus. The results of this study support that a MFP on OSU's campus could better and more efficiently support improved food security among its students in need by helping to achieve the five dimensions of access (Penchasky & Thomas, 1981), especially accessibility, accommodation, and availability (see Figure 1) while meeting a basic need of all humans (Maslow, 1943).

The importance of both promotion and partnerships (Cornell University & Feeding America, 2016; Howe & Sindorf, 2020) was reinforced by the finding that more than one-half of the students became aware of the ODB MFP from another person at OSU and about one-fourth from advertisements or promotional items. The results also revealed that even though food insecurity was high among the students surveyed, many students were either unaware of or did not use the ODB's stable location food pantry service, which is about two miles from their campus. Moreover, even though almost three-fourths of the students indicated that they had never used ODB's services, nearly as many were *extremely likely* to use such in the future.

The need for a food assistance program that travels to be closer to the student population at OSU was supported by about one-third of the students who reported no grocery store or food market within walking distance from their place of residence and by more than one-half who either walked or rode a bicycle as their primary mode of transportation. MFPs may vary in logistics, but all have the same purpose of providing access to food by bringing the goods closer to those needing their services.

### Recommendations for Practice

ODB's offering of a MFP on OSU's campus should continue while providing afternoon and evening service and consider doing this at multiple campus locations. Some students were unaware of the services ODB offered, but most were open to using them. ODB should continue to offer a wide variety of foods from which clients can choose, as well as directing clients to resources external to its services. ODB's outreach might also include assistance with applying for governmental programs such as the Supplemental Nutrition Assistance Program (SNAP). Representatives of ODB, including its MFP staff, should be invited to provide an informational booth at various student orientations and similar meetings throughout the academic year at OSU. In addition, a recommendation should be made to the cognizant administrators of OSU regarding the necessity to assist students experiencing acute food insecurity more systematically and purposefully.

### Recommendations for Additional Research

Future research should focus on food insecurity among specific demographic groups on college campuses, such as graduate students, as well as Black, Hispanic, Native American students, international students, students with domestic partners and/or dependent children, and many other underrepresented groups of students. More specifically, future research on OSU's campus should also investigate what kinds of foods students want to receive. Many students experienced hunger at some point because they did not have enough money to purchase food. Studies regarding student budgets and financial priorities may be beneficial in investigating this issue and in developing targeted programs to address food resource management. Future researchers may also consider exploring whether a relationship exists between a student's food insecurity status before entering college and as a college student. Where appropriate, the study's response scale should be modified to include the option *unknown* for students who may have been uncertain regarding their answers to select questions. This modification could improve the validity of the respondents' answers.

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