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## THE URI FREE FARMERS' MARKET AND FOOD ACCESS AMONG COLLEGE STUDENTS

Maria Meola  
*University of Rhode Island, maria\_meola@uri.edu*

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THE URI FREE FARMERS' MARKET AND FOOD ACCESS AMONG  
COLLEGE STUDENTS

BY MARIA MEOLA

A THESIS SUBMITTED IN PARTIAL FULFILLMENT  
OF THE REQUIREMENTS FOR THE DEGREE OF  
MASTER OF SCIENCE IN NUTRITION

THE UNIVERSITY OF RHODE ISLAND  
2024

MASTER OF SCIENCE THESIS

OF

Maria Meola

APPROVED:

Thesis Committee:

Major Professor      *Sarah Amin and Amanda Missimer*

*Kathleen Gorman*

*Isaac Agbemaflle*

*Brenton DeBoef*

DEAN OF THE GRADUATE SCHOOL

UNIVERSITY OF RHODE ISLAND

2024

## ABSTRACT

**Background:** Campus-based programs to promote food access have become more prevalent on college campuses due to rising food insecurity among students. Despite this, there is a notable gap in qualitative research investigating students' experiences regarding food access and intervention acceptability. In 2021, the University of Rhode Island (URI) Free Farmer's Market (FFM) was developed to promote student access to produce from URI campus farms. **Objective:** This study aims to assess student perceptions surrounding use and acceptability of the URI FFM and also understand the role this plays in student changes to food access throughout the semester. **Study Design, Settings, Participants:** A cross-sectional mixed methods approach was used in which participants completed a 17-item "Market Reach" survey assessing demographic information and program acceptability. An "interview" survey was used to assess demographics, campus resource utilization, and food security status. Semi-structured interviews addressed produce utilization, food resource management, perceived acceptability of cooking space, and suggestions for future participant needs. During the 2022 FFM, 96 participants were willing to be contacted and 23 completed the survey and participated in an interview. **Measurable Outcome/Analysis:** Survey responses were analyzed using descriptive statistics. Interviews were transcribed and a codebook was constructed using an inductive and deductive approach based on interview domains and research team discussions. A thematic analysis was used to identify preliminary themes. **Results:** Of the 878 participants that completed the Market Reach survey (72% female, 73% White, and 77% undergraduate student) 108 were contacted and 23 completed an interview. Of these 23 participants (84% female, 73% White, 73% undergraduate) 56% indicated having some form of food insecurity

based on the USDA 6-item screener (score 2-6= food insecurity). Themes include Food Access Changes Throughout the Semester, Motivation to Participate, Participant Need for Nutrition Education, Positive Free Farmers' Market Perceptions, and Potential Future Changes Based on Student Need. **Conclusion:** By evaluating students' attitudes and experiences, this research informs strategies for improving food access within the URI community and methods of assessment for future studies. Specifically, these findings highlight the diverse challenges students face regarding food access, underscoring the necessity for food and nutrition education interventions to address their multifaceted needs effectively.

## ACKNOWLEDGMENTS

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## PREFACE

This thesis was prepared according to the University of Rhode Island graduate school Manuscript Thesis Format and follows the author guidelines for *The Journal of Nutrition Education and Behavior*. Upon submitting this thesis to the graduate school, the manuscript may be submitted for publication.

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## CHAPTER 1

### MANUSCRIPT

#### **“The URI Free Farmers’ Market and Food Access Among College Students”**

By

Maria Meola<sup>1</sup>

Amanda Missimer, PhD, RD, LDN<sup>2</sup>

Kathleen Gorman, PhD<sup>3</sup>

Isaac Agbemaflé, PhD<sup>4</sup>

Sarah Amin, PhD, MPH<sup>5</sup>

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<sup>1</sup> Department of Nutrition, Fogarty Hall, University of Rhode Island, Kingston RI  
(maria\_meola@uri.edu)

<sup>2</sup> Department of Nutrition, Fogarty Hall, University of Rhode Island, Kingston RI  
(amanda\_missimer@uri.edu)

<sup>3</sup> Department of Psychology, University of Rhode Island, Kingston RI.  
(kgorman@uri.edu)

<sup>4</sup> Department of Nutrition, Fogarty Hall, University of Rhode Island, Kingston RI  
(isaac.agbemaflé@uri.edu)

<sup>5</sup> Department of Nutrition, Fogarty Hall, University of Rhode Island, Kingston RI  
(sarah\_amin@uri.edu)

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## INTRODUCTION

The image of a traditional college student has shifted over the last 50 years to reflect more diverse demographic and lifestyle characteristics within the population.<sup>1</sup> Today's college student can be from any financial bracket with a myriad of associated limitations to academic and professional success. With this, limited access to food has become a rising concern for college campuses. Food access is defined as the ability to obtain food, and encompasses physical access, such as distance to a store or the number of stores in a given area, as well as economic access to individual-level resources, such as personal income and availability of transportation.<sup>2</sup> Food insecurity is defined as, limited or uncertain access to nutritionally adequate and safe food or ability to acquire acceptable foods in socially acceptable ways due to a lack of money or other resources.<sup>3</sup> The prevalence of food insecurity on college campuses is estimated to be 12.5-84%. This wide range indicates a lack of consistent evaluation across institutions. According to Nikolaus et al., 41%<sup>4</sup> of college students report experiences with food insecurity.

The connection between food access and food insecurity is important as food insecurity arises from limited food access. Therefore, addressing issues of food access is crucial in the ongoing discussion of food insecurity within college students. Research indicates that students faced with challenges to food access are more likely to encounter mental and physical health disparities as a result of limited access to food.<sup>4</sup> Additionally, this situation negatively impacts grade point average and academic goals.<sup>5</sup> Despite this, there are few studies that assess the impact and acceptability of campus-based programs and interventions that address food access,

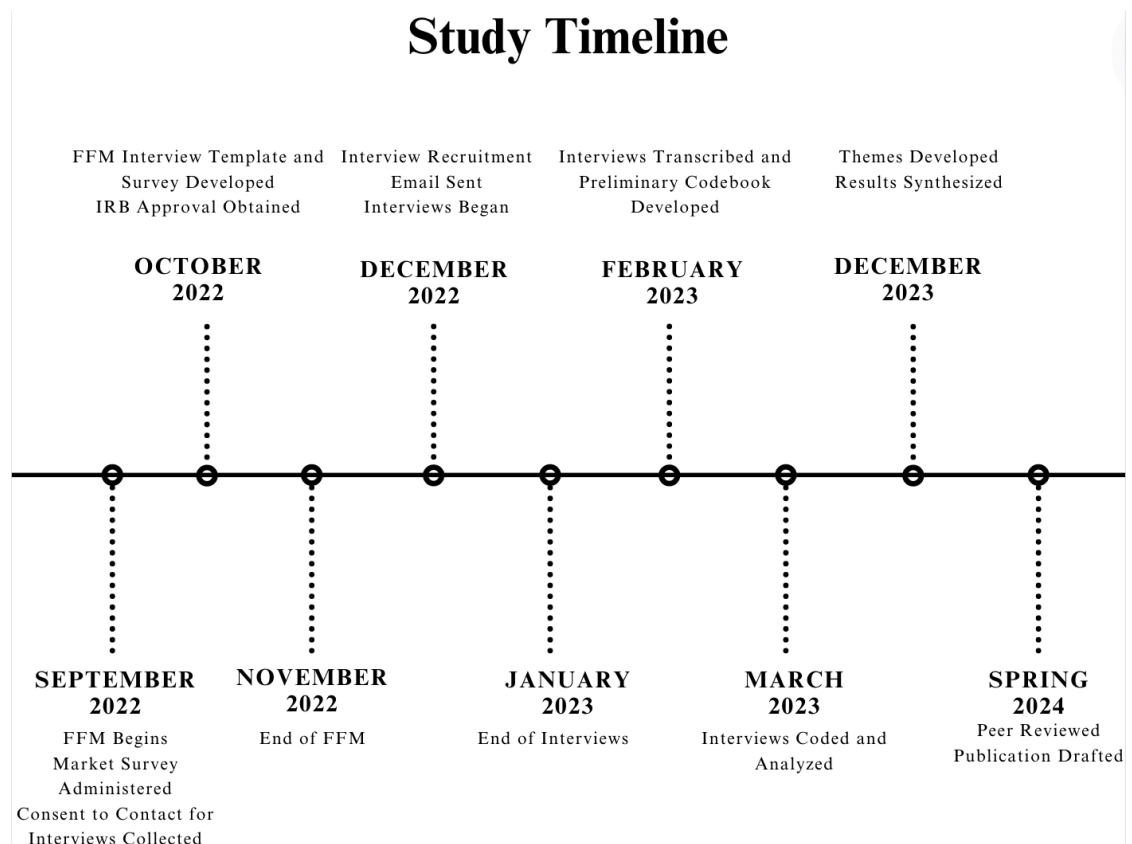
program acceptability, and food resource management (ie. a set of techniques surrounding adequate selection of foods).<sup>6</sup> A novel ‘free’ farmers’ market is a campus-based initiative aimed at improving food access among college students by utilizing a localized food system which mobilizes produce to the center of campus. However, there is a lack of qualitative research on how programs like the Free Farmers’ Markets are implemented, as well as student acceptability and use of these types of programs, given that this type of intervention is emerging on college campuses. The University of Rhode Island (URI) Free Farmers’ Market (FFM) is a campus-based approach that was piloted in 2021 and has been delivered in the fall of each year since. The aim of this research is to assess the perceptions of food access, food resource management, and program acceptability of college students who attended the FFM.

## METHODOLOGY AND PROCEDURES

### *Study Design*

A general “Market Reach” survey was distributed to capture FFM reach through a series of questions regarding demographics, campus resource use, food security status, and program acceptability. A cross-sectional mixed methods study was used to gain a more robust understanding of student experiences and program acceptability of the URI FFM, produce use, food resource management, food security status, and need among students through the use of a seventeen-question “Pre-Interview” survey and 20-30 minute virtual semi-structured interview.

### *Study Timeline*



### ***Participant Recruitment***

This study included URI students, staff, and community members that have attended the FFM at least once during the Fall 2022 semester, which is hosted once per week at various locations throughout campus. The participants were recruited through the Market Reach survey distributed to everyone attending the FFM. Volunteers at the market distributed Quick Response (QR) codes for the Market Reach survey that assessed FFM user demographics, repeat visits, food security status, program acceptability. Within this survey was an option to provide their email address with consent to be contacted for interview recruitment. Those that provided their email address were contacted to complete a survey to determine study eligibility and schedule an interview. To qualify for this study, all participants must be above the age of eighteen and have provided consent to be contacted. Prior to the interviews, participants reviewed the consent with the study administrator before agreeing to participate in the study and have the interview recorded.

### ***Instruments***

**Market Reach Survey:** Participants completed a brief 16-item (5-10 minute) online survey on the platform Qualtrics.<sup>7</sup> Qualtrics is a platform used to design and administer surveys that can be accessed on any computer or mobile device. Questions regarding demographics, campus resource use, and program acceptability were asked in this survey. Participation in Pell Grant and federal work study was used as a proxy for student socioeconomic status. A validated two item food security screening tool was used to measure food security status and responses were measured on a Likert

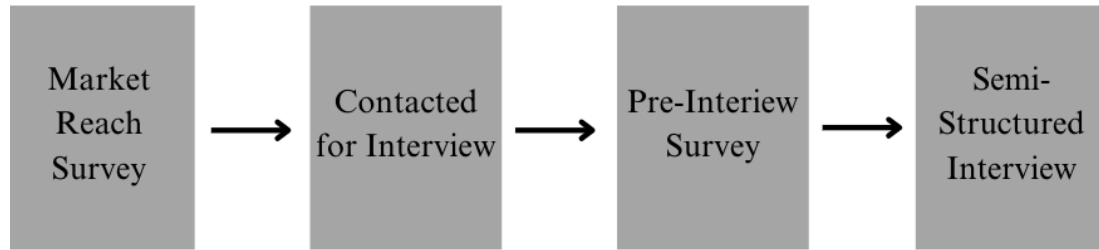
scale of frequency with response options of “often true”, “sometimes true”, and “never true”.<sup>8</sup> The full Market Reach Survey can be found in Appendix C. Within the Market Reach survey, program acceptability was measured through four questions with five response options on a likert scale. The survey asked participants to rank how much they agree or disagree with the following statements: “The FFM meets my approval”, “The FFM is appealing to me”, “I like the FFM”, “I welcome the FFM”. Response options included: “Completely disagree”, “disagree”, “Neither disagree nor agree”, “Agree”, “Completely agree”. This scale is a validated tool that measures Acceptability of Implementation (AIM), Intervention Appropriateness (IAM), and Feasibility of Intervention Measure (FIM).<sup>11</sup> The acceptability construct was used to determine program acceptability. Due to challenges in accurate identification number entry among Market Reach survey participants, individual level data cannot be determined. At the end of the Market Reach survey, participants were asked to provide their email address if they would like to be contacted to discuss their experience at the FFM. Those that consented to be contacted were then emailed the “Pre-Interview” survey.

**Pre-Interview Survey:** Prior to participating in interviews, participants completed a brief 17-item (5-10 minute) online survey on the platform Qualtrics. The survey asked questions regarding demographics and campus resource use. Also included was a modified version of the U.S. Household Food Security Survey Model (HFSSM) Six-Item Short Form. This validated survey was modified by the research team to describe a recall time frame of the “past semester” rather than the “past twelve

months” to ensure it captures short-term food security during the student’s time in school, as students' level of food access can vary greatly during their time outside of the typical school semester.<sup>9</sup> The HFSSM contains six questions, some of which contain responses measured on a Likert scale of frequency with response options of “often true”, “sometimes true”, and “never true”. Other questions contain simple “yes” or “no” response options.<sup>10</sup> At the end of the Pre-Interview survey, participants had the option to schedule a virtual interview. The full Pre-interview survey can be found in Appendix D.

**Semi-Structured Interview:** The semi-structured interview template was designed to inquire about participant experiences with the FFM and food access on campus. The research team developed the interview template along with the input from faculty and staff with expertise in food insecurity, food access and nutrition with college-aged students. The interview template addressed the following domains across six questions: types of food taken home from the market and how it is used, food resource management, need for nutrition education, and any additional resources participants would like to see included in the future. To assess produce use, a schematic was displayed during the interview depicting an example 25%, 50%, 75%, and 100% of a typical bag of produce that a participant would receive from the FFM in a given week. Participants were asked how much of their typical weekly FFM bag they ate, donated, and threw away. The research team conducted several rounds of pretesting of the interview template with a similar audience prior to beginning data collection. The full interview template can be found in Appendix E.





### ***Data Collection***

The Market Reach survey was distributed by FFM volunteers during the time of the market via QR code. Participants were asked to complete the Market Reach Survey while waiting in line for the FFM. Market Reach survey and Pre-interview survey data was collected through Qualtrics. With a goal of completing twenty-five interviews, multiple recruitment emails containing the Pre-Interview survey were sent to those who consented to be contacted over several weeks. Interviews were scheduled as recruited participants completed the Pre-interview survey until multiple recruitment efforts had been done and saturation was reached at twenty-three interviews. Participants were compensated with a \$25 dollar gift card for completing the survey and participating in the interview. The interviews occurred on Zoom and lasted for approximately twenty to thirty minutes. Three members of the research team conducted the interviews with participants including a nutrition faculty member, graduate student research assistant, and undergraduate student research assistant. The interview audio files were de-identified prior to transcription and verified through Zoom and backup recording methods such as iPhone voice memo recording and a digital voice recorder. Interviews were transcribed by the researcher and a trained undergraduate research assistant from January-February 2023.

### ***Data Analysis***

Descriptive statistics of the participants were analyzed from both the Market Reach survey and Pre-interview survey responses through Qualtrics. In the Market Reach Survey program acceptability data was only analyzed from those who reported being repeat users, as those who reported being first time users would not yet have used the FFM at the time of taking the survey, because it was taken by participants while standing in line waiting for the FFM. In the Market Reach survey, responses to the two-item food security screener of “Often True” or “Sometimes True” were considered an affirmative response. An affirmative response on either item was considered to be positive for food insecurity. In the Pre-interview survey, responses to the HFSSM six-item questionnaire were analyzed using affirmative responses of “often true”, “sometimes true”, or “yes”. Zero to one affirmative responses indicate high or marginal food security, two to four affirmative responses indicate low food security, and five to six affirmative responses indicate very low food security.

A codebook that specifies each code name and definition was developed to analyze the interview data based on discussions with the research team as data was being collected. Codes were initially constructed deductively based on interview questions and initial research discussions surrounding responses that surfaced during the interviews.<sup>12,13</sup> The interview transcripts were subjected to a thematic analysis using inductive and deductive approaches.<sup>14</sup> Coders met weekly as transcripts are coded to identify any new codes that emerged throughout the coding process, apply these to previous transcripts, and discuss themes. A minimum of two independent coders are necessary to ensure intercoder reliability (ICR).<sup>15</sup> Thus, two members of the

research team coded a randomly selected subset of data and compared code patterns. If there was disagreement, a third member of the research team then reviewed the codes to build a consensus. Any discrepancies in code definitions or interpretations between coders were rectified to refine the codebook and interpretation of codes as it relates to developing these themes, and to establish ICR. Once high inter-coder agreement was established, remaining transcripts were coded individually.<sup>16</sup> This iterative process continued until saturation was reached and final themes were identified. Themes and subthemes were identified by determining the most frequently used codes within the interview data. Qualitative data was analyzed using Dedoose software.<sup>17</sup> The University of Rhode Island Institutional Review Board has approved all study procedures.

## RESULTS

### *Participant Demographics & Use of Campus Resources*

During Fall of 22, 878 FFM attendees participated in the Market Reach survey. This sample identified predominantly as female (n=635, 72%), White (n=640, 73%), and undergraduate students (n=678, 77%). When assessing socioeconomic status proxies, it was found that approximately 11% (n=94) of participants reported that they qualified to participate in work study and approximately 29% (n=257) of participants reported that they are first generation college students. Most participants reported that they lived off campus at the time of taking the survey (n=512, 58%; Table 1). According to the two-item food security screener approximately 57% of participants screened as having food insecurity. Food security status scores of the Market Reach survey participants can be found in Table 3.

Of 878 FFM attendees, 109 were contacted to participate in this study and 23 completed both the Pre-Interview survey and virtual semi-structured interview (24% response rate). To better understand the characteristics of FFM attendees who wanted to further discuss their experience at the market, Market Reach Survey data from those 109 participants is compared alongside the Market Reach survey sample and the Pre-Interview survey sample in Table 1. Interview Participants were predominantly female (n=20, 86%), and the majority identified as White (n=17, 74%). Participants were primarily undergraduate students (n=17, 74%). When assessing socioeconomic status proxies, it was found that 26% (n=6) of participants reported that they qualified to participate in work study and received a federal Pell Grant and 30% (n=7) of participants reported that they are first generation college students. All other

participant demographics are reported in Table 1. When assessing campus resource used, the majority of participants reported that they do not live in campus housing (n=19, 83%), they did not purchase any form of academic meal plan for the semester in which the survey was conducted (n=16, 70%), and that they were responsible for purchasing their own food (n=21, 91%). Many participants were repeat users of the FFM (n=13, 57%; Table 2). Other participant use of campus resources are reported in Table 2. Raw scores from the U.S. HFSSM Six-Item Short Form of 0-1 determined high food security (n=10, 43%), 2-4 determined low food security (n=7, 30%), and 5-6 determined very low food security (n=6, 26%), estimating that approximately 57% (Table 3) of participants have some form of food insecurity. Despite this, few participants reported use of the campus food pantry, Rhody Outpost (n=3, 13%).

Overall, the Pre-interview survey participants are representative of the Market Reach survey sample in that a majority of participants of both surveys identified as white, female, and undergraduate students. However, Pre-interview survey participants were more likely to have affirmative responses to the socioeconomic status proxies questions, live off campus, and utilize campus resources.

### ***Program Acceptability***

The majority of Market Reach survey participants responded “agree” or “completely agree” to the statements regarding program acceptability and 3% of participants responded “neither disagree nor agree” “disagree” or “completely disagree” to any of the statements. Participant program acceptability data can be found in Table 5.

Overall, the FFM was highly rated and interviews were conducted to further

understand produce use, food resource management, and future needs of FFM attendees.

### ***FFM Produce Selection and Use***

Participants that completed the Pre-interview survey reported selecting a wide variety of produce from the FFM including green and leafy vegetables, red and orange vegetables, starchy vegetables, fruits, and eggs. All participants reported eating at least 50% of the produce they selected from the market in a given week and a majority reported eating 75% or more. When asked what led them to not use their FFM produce, a majority of participants responded that their produce had become rotten before they had the opportunity to use it (n=11, 48%) or that they were unable to prepare their produce properly to eat it (n=3, 13%; Table 6). Some participants reported that they had donated FFM produce they felt they could not eat to friends or roommates (n=9, 39%).

### ***Themes Generated From Interviews***

After transcribing and coding, five main themes were derived from the interviews: (1) Food access changes throughout the semester, (2) Motivation to participate, (3) Participant need for nutrition education, (4) Positive free farmers' market perceptions, and (5) Potential future changes based on student need. All themes and supporting key quotes can be found in Table 7.

### ***Food Access Changes Throughout the Semester***

**Perceived Lack of Time:** The challenges to food access faced by college students was emphasized by many of the participants in their semi-structured

interviews. Particularly, many described their level of food access changing throughout the semester due to a variety of factors. A primary factor driving this fluctuation is the amount of time participants feel they must dedicate to accessing food throughout the semester. Some participants expressed that they are more likely to change their food access patterns when time is scarce:

*When I'm busier I tend to just not go to the grocery store. -P10*

The perceived lack of time emerges as a central theme impacting participants' food access patterns, particularly as their schedules fluctuate throughout the semester. Participants noted a shift towards convenience foods, such as eating out or ordering in, during periods of increased time constraints, underscoring the dynamic relationship between time availability and food choices.

**Academic Workload:** More specifically, participants expressed that their lack of time coincides with their academic load and that the amount of school work they are required to accomplish at any given time can negatively affect their ability to access food. This experience is exacerbated by the typical periods of intensity that occur throughout the semester such as midterms and finals weeks.

*I get busy, I have two majors so it just racks up in work and I just don't have really time to go off campus and buy stuff -P5*

Participants also reported that the amount of school work they are tasked with can negatively affect the quality of food they are able to access during points of the academic calendar when they are balancing a larger workload.

*I find that when I'm crunched for time, it's harder to get affordable healthy food, and I compromise by sometimes getting unhealthy affordable food. I'd*

*say we're looking at time constraints during exam, so like midterms and finals is when those unhealthy food habits tend to creep back -P17*

Academic workload presents a significant challenge for participants, intertwining with their limited time and impacting their ability to access food. This struggle is particularly pronounced during periods of heightened intensity, such as midterms and finals, leading to compromises in both amount and quality of food.

**Changes in Employment:** Some participants also expressed that the amount of time they are able to dedicate to their on- and off-campus jobs varies throughout the semester. With inconsistent hours available to earn money, participants experience an inconsistent amount of financial resources to access food.

*Because it's the end of semester and I haven't been able to work as much, especially with the rising cost of groceries at the store, I've been a lot more conscious of what I should buy and what I can buy. When I go to the store I try to buy things that will last me a long time that are nutritious -P4*

Changes in employment status throughout the semester contribute to participants' fluctuating financial resources, impacting their ability to afford nutritious food. As participants navigate inconsistent hours and rising grocery costs, they prioritize purchasing items with longevity and nutritional value, reflecting a conscious effort to manage their food budget effectively amidst financial constraints

**Weather:** Participants expressed that weather patterns such as temperature changes during the semester, rain, or snow deterred them from accessing their normal foods and that they are more likely to choose foods that were perceived as convenient when weather conditions are not favorable.



*If the weather starts changing up fast, sometimes you're a little bit more in your room. So I'll eat just more things that I have, that I pre-purchased -P15*

Weather conditions significantly influence participants' food access behaviors, with adverse weather deterring them from accessing their usual food sources. In response, participants opt for food options readily available in their dorms or off campus houses, highlighting the role of weather in shaping dietary choices during the semester.

**Mental Health:** Mental health fluctuations during the semester was also determined to play an important role in participants' ability to access food. Participants expressed finding it difficult to consistently prioritize their food-related needs when struggling with their emotional wellbeing.

*In the beginning I would go to the store more frequently because I feel like my mental health is better -P5*

Participants noted a correlation between periods of improved mental health and increased frequency of store visits, highlighting the complex interplay between emotional state and food access habits

**Commuter Student Barriers:** Finally, participants that did not live on campus or have a campus meal plan at the time of the interview expressed barriers to food access unique to commuter students. Some reported feeling like the cost of food on campus is not affordable, discouraging them from purchasing food while on campus and having difficulty accessing food otherwise.

*A lot of days like, I am really hungry because I'll spend from like 11 o'clock in the morning to like 8 o'clock at night on campus, and like maybe have a*

*protein bar or something, because I don't have a meal plan, and I'm like absolutely starving - P20*

Without a meal plan, these students often struggle to find affordable and accessible food alternatives, enduring long hours on campus without adequate meals.

### ***Motivation to Participate***

**Free Food:** Many participants reported that there was often a long line of people waiting for produce or that they were only able to stop by the market quickly in between class time. Despite this, participants expressed that they felt it was worth it to stand in line in order to take advantage of the free food being distributed, given the rising cost of food in typical supermarkets and grocery stores.

*Well, fruits and vegetables are really expensive these days and I don't have a whole lot of money, so it was just a really good opportunity. -P9*

Participants value opportunities to access free food, particularly fresh produce, even if it means enduring long lines or making quick stops between classes.

**Fresh Food:** In addition to the appeal of free food, many participants reported that they enjoyed the convenience of not having to go to a conventional grocery store and the novelty of having access to fresh produce, harvested from a hyperlocal food system.

*I guess I just like to have fresh produce because I miss seeing where my food is coming from and just having fresh produce that you just don't really have on the college campus normally. -P12*

Participants appreciate the convenience of the FFM and enjoy the opportunity to reconnect with the source of their food and access items not typically available on college campuses.

**Desire to Try New Foods:** The desire to try new things was also an important motivator for participants to attend the market. Many participants reported that they encountered a new vegetable or fruit at the market that they had never seen or never had the opportunity to try before (n=14), and that encouraged them and allowed them the freedom to be creative and to explore incorporating the produce into new recipes.

*I didn't already have something planned out, I wouldn't spend the money to get something new just to be like, 'oh, let me try something'. But to have it, you know it kind of puts you in that place to think, 'well, what can I do with this?'"*

*-P15*

The opportunity to experiment with new ingredients, facilitated by the availability of free produce, encourages participants to broaden their culinary horizons and discover innovative ways to incorporate fresh produce into their meals.

### ***Participant Need for Nutrition Education***

**Produce Preparation Resources:** Some participants reported that they did not know how to prepare all of the produce they received from the market and requested basic food preparation instructions to aid in their use of FFM produce.

*Just knowing how to cook a specific produce- that would be awesome.*

*Because, honestly, throughout my time cooking off campus I had to look up 'how do I cook the sweet potato?', or like, 'how long should I leave this in the oven to broil?' stuff like that -P21*

Additionally, over 50% of participants (n=12) responded that they would be interested in receiving food preparation tools in order to help them better utilize the produce they receive from the market.

**Direct Education- Cooking Classes:** Beyond basic food preparation instructions, some participants expressed a higher level of need for education surrounding food preparation and FFM produce use. These participants suggested that the FFM provide live or virtual education sessions or cooking classes.

*That would be so fun. I mean, I don't feel like a real adult so, I think like any sort of home-ec kind of thing, because I never got that in my high school either.*  
-P23

Participants view potential education opportunities as not only practical but also enjoyable, offering a chance to enhance their culinary skills and fill gaps in their knowledge, especially for those who may have not had access to this type of education in the past.

**Food Safety & Storage Resources:** In addition to information on how to use the produce distributed from the FFM, participants expressed a need for food safety and storage instructions. Many participants felt they didn't understand the best ways to store their food after bringing it home from the market.

*Sometimes I wouldn't even know the name of things or like how to store it. I would get confused if I should put certain things in the refrigerator, or leave it out on the counter.* -P13

Participants expressed confusion regarding proper storage practices, suggesting a potential opportunity for the Farmers' Market to provide resources or workshops to educate participants on effective food preservation techniques

### ***Positive Free Farmers' Market Perceptions***

At the end of each interview, participants were asked to reflect broadly on their experience at the market and were encouraged to share anything they wanted before concluding. Almost all participants expressed a positive perception of the FFM and gratitude towards the program.

*When I first saw it, I was in disbelief. It was like the best thing ever, so I think it's fantastic that you guys are doing that. My family was really, really happy when I came home with all of that. And it definitely makes you feel like this school is supporting you, so it was really, really comforting, and helpful.*

*-P9*

Participants overwhelmingly expressed positive perceptions of the FFM, emphasizing its significance as a valuable resource and expressing gratitude towards the program. They viewed the FFM as a source of support from the school, providing essential groceries that alleviate financial strain and contribute to a sense of comfort and community.

### ***Potential Future Changes Based on Student Need***

**More Variety:** When asked what ingredients they wanted to see at the FFM in the future, many participants expressed interest in the market providing ingredients that could add variety and flavors to their meals (n=20).

*If you guys could start doing things like spices and stuff like that, I feel like that would be great, too, because that's something I always want to get from the grocery store, but never do. -P21*

These ingredients are often overlooked but highly valued by participants for their ability to elevate dishes. This feedback highlights an opportunity for the FFM to expand its offerings and better meet the diverse culinary preferences and needs of students. Overall, there was not any further feedback from students regarding what they would like to see from the FFM in the future, outside of spices and more variety in produce.

## DISCUSSION

The URI FFM is a campus-based initiative that represents a proactive response to the diverse and evolving needs of the modern college student and works to increase food access for students, a prevalent issue affecting academic success and overall well-being in this population, by promoting access to produce from URI campus farms. This study aimed to assess student perceptions surrounding use and acceptability of the URI FFM including its impact on student food access and provide insights into the efficacy of campus-based interventions aimed at enhancing food access and resource management. Through an online survey and virtual semi-structured interviews, twenty-three participants reported on produce utilization, food resource management, FFM perceptions, and suggestions for future participant needs.

Survey findings align with the literature emphasizing gaps in the utilization of campus resources among participants, indicating a need for greater awareness and accessibility of support services.<sup>18</sup> Results were also consistent with existing literature which emphasizes the multifaceted nature of food access that involves complex interactions between financial, social, and psychological factors.<sup>19</sup> The qualitative analysis revealed several themes that shed light on students' experiences and perceptions of the FFM. The theme of "Food Access Changes Throughout the Semester" highlights the dynamic nature of food insecurity among college students, influenced by academic demands, financial constraints, weather conditions, and mental health. This finding underscores the need for flexible and responsive food assistance programs that can adapt to students' evolving needs over the course of a

semester which is consistent with the literature.<sup>9</sup> The theme “Motivation to Participate” revealed that despite challenges, participants were motivated to attend the FFM by the appeal of free, fresh produce, as well as the opportunity to try new foods. The convenience and novelty of the market served as key motivators for students to engage with the program. Within the theme of “Participant Need for Nutrition Education” participants expressed a desire for nutrition education to complement the FFM and incentives such as food preparation tools, indicating a gap in knowledge and skills related to food preparation and storage that has been reported in current literature.<sup>20</sup> This suggests an opportunity to enhance the program's impact by incorporating educational components that empower students to make healthier and more sustainable food choices. Within the theme “Positive Free Farmers’ Market Perceptions” participants expressed overwhelmingly positive perceptions of the FFM, citing appreciation for the accessibility of fresh produce, the sense of community fostered by the market, and the support provided by the program. The URI FFM's approach of providing free, fresh produce addresses a critical aspect of this by improving access to nutritious food options. Participants provided valuable insights in the theme “Potential Future Changes Based on Student Need”, including offering a wider variety of produce to enhance diversity and improve cultural relevance of ingredients distributed at the FFM..

### ***Strengths and Limitations***

Strengths of this study include its comprehensive mixed-methods approach, which combines quantitative survey data with qualitative semi-structured interviews to



provide a multifaceted understanding of student experiences with the FFM. Furthermore, the data collection and analysis processes, including inter-coder reliability checks and thematic analysis, enhance the study's conclusions. However, its limitations should be acknowledged. The study's cross-sectional design limits the ability to establish causal relationships or capture changes in food access and insecurity over time. Secondly, the sample size of 23 participants may not fully represent the diversity of experiences within the URI population. Additionally, the study's reliance on self-reported data may introduce response biases and social desirability effects. Because the survey was taken by participants while they were waiting in line for the FFM, program acceptability data from the Market Reach survey is only taken from repeat users, as those who reported being first time users would not yet have used the FFM at the time of taking the survey. Due to the length of the FFM, only 8-weeks out of the year, it's true impact may not be fully represented. Finally, the study's focus on a single program may limit the generalizability of the findings to other institutions or community contexts. Despite these limitations, the study provides valuable insights into the implementation and impact of campus-based food access programs, highlighting opportunities for future research and practice in improving food access among college students.

## IMPLICATIONS FOR RESEARCH AND PRACTICE

The URI FFM serves as a promising model for addressing food insecurity and food access among college students, offering valuable insights for program development and evaluation. Future research could focus on longitudinal studies to assess the long-term impact of the campus programs aimed at improving food access on students' dietary behaviors, academic performance, and overall well-being. Student health outcomes could be measured to further investigate the impact of the FFM and similar programs. Additionally, further investigation into the barriers to accessing campus resources could inform strategies to improve uptake among food-insecure students. In practice, the findings suggest the importance of integrating nutrition education and food preparation skills into food assistance programs on college campuses. By equipping students with the knowledge and tools to make informed food choices, these programs can enhance their effectiveness and promote food access.

## CONCLUSION

The URI FFM represents a proactive and collaborative approach to improving food access among college students. By understanding the complex nature of food access, programs like the URI FFM can be better implemented to make a meaningful impact on students' health, ultimately supporting their overall well-being.

**Table 1: Market Reach Survey and Pre-Interview Survey Participant**

**Demographics**

Characteristic		Market Reach Survey Participants (n=878)	Participants Contacted for Interview (n=109)	Pre-Interview Survey Participants (n=23)
<b>Gender</b>				
	<b>Woman</b>	635 (72%)	94 (86%)	20 (86%)
	<b>Man</b>	203 (23%)	13 (12%)	2 (9%)
	<b>Non-binary</b>	40 (5%)	2 (2%)	1 (5%)
<b>Race</b>				
	<b>White</b>	640 (73%)	83 (76%)	17 (74%)
	<b>Black or African American</b>	57 (6%)	6 (6%)	2 (9%)
	<b>Asian</b>	137 (15%)	19 (18%)	4 (17%)
<b>Ethnicity</b>				
	<b>Non-Hispanic/Non-Latino</b>	674 (77%)	86 (79%)	20 (87%)
	<b>Hispanic/Latino</b>	204 (23%)	14 (13%)	3 (13%)
<b>Academic Standing</b>				
	<b>Undergraduate Student</b>	678 (77%)	84 (77)	17 (74%)
	Freshman	–	–	1
	Sophomore	–	–	0
	Junior	–	–	7
	Senior	–	–	9

	<b>Graduate Student</b>	114 (13%)	14 (13%)	4 (17%)
	<b>Other (Staff/Community Member)</b>	86 (10%)	9 (8%)	2 (9%)
<b>Socioeconomic Status Proxies</b>				
	<b>Pell Grant Recipient</b>	108 (12%)	21(19%)	6 (26%)
	<b>Participate in or Qualify for Work Study</b>	94 (11%)	16 (15%)	6 (26%)
	<b>First Generation College Student</b>	257 (29%)	33 (30%)	7 (30%)
	<b>Transfer Student</b>	73 (9%)	12 (11%)	2 (9%)

–: denotes data not collected

**Table 2: Market Reach Survey and Pre-Interview Survey Participant Use of  
Campus Resources**

<b>Resource</b>	<b>Market Reach Survey Participants (n=878)</b>	<b>Participants Contacted for Interview (n=109)</b>	<b>Pre-Interview Survey Participants (n=23)</b>	
<b>Housing</b>				
	<b>On-Campus</b>	318 (36%)	32 (29%)	4 (17%)
	<b>Off-Campus</b>	512 (58%)	76 (70%)	19 (83%)
	<b>Other</b>	48 (6%)	1 (1%)	0
<b>Meal Plan</b>				
	<b>Unlimited Meal Plan</b>	–	–	2 (9%)
	<b>Flex Meal Plan</b>	–	–	5 (22%)
	<b>No Meal Plan</b>	–	–	16 (69%)
<b>Campus Wellness Resources</b>				
	<b>Rhody Outpost (Campus Food Pantry)</b>	41 (5%)	6 (5%)	3 (13%)
	<b>Campus Recreation Centers</b>	393 (45%)	50 (46%)	13 (57%)
	<b>Counseling Center</b>	139 (16%)	24 (22%)	7 (30%)
	<b>Campus Registered Dietitian</b>	–	–	2 (9%)
	<b>None of the Above</b>	319 (36%)	45 (41%)	5 (22%)
<b>FFM in Previous Year (2021)</b>				
	<b>Yes</b>	380 (43%)	26 (27%)	13 (57%)
	<b>No</b>	498 (57%)	83 (76%)	10 (43%)

–: denotes data not collected

**Table 3: Market Reach Survey Participant Food Security Status**

<b>Affirmative Response</b>	<b>Participants (n=878)</b>	<b>Participants Contacted for Interview (n=109)</b>
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<b>Sometimes True</b>	366 (42%)	55 (50%)
<b>Often True</b>	133 (15%)	20 (18%)
<b>Total</b>	499 (57%)	75 (69%)

**Table 4: Pre-Interview Survey Participant Food Security Status**

<b>Food Security Level</b>	<b>U.S. HFSSM Score</b>	<b>Participants (n=23)</b>
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<b>High Food Security</b>	<b>0-1</b>	10 (43%)
<b>Low Food Security</b>	<b>2-4</b>	7 (30%)
<b>Very Low Food Security</b>	<b>5-6</b>	6 (26%)

**Table 5: Market Reach Survey Program Acceptability**



<b>Program Acceptability</b>	<b>Participants (n=309)</b>				
	<b>Completely Disagree</b>	<b>Disagree</b>	<b>Neither Agree Nor Disagree</b>	<b>Agree</b>	<b>Completely Agree</b>
<b>The FFM Meets My Approval</b>	6	7	15	74	207
<b>The FFM Is Appealing to Me</b>	3	3	11	63	229
<b>I like the FFM</b>	4	1	15	61	228
<b>I Welcome the FFM</b>	5	2	7	57	238

**Table 6: FFM Produce Selection & Use of Interview Participants**

<b>Produce Selected</b>		<b>Participants (n=23)</b>
Green/Leafy Vegetables		20
Red/Orange Vegetables		21
Starchy Vegetables		10
Fruits		6
Eggs		7
<b>Produce Use</b>		<b>Participants (n=23)</b>
<b>% Produce Eaten</b>		
	100%	7
	75%	11
	50%	5
	25%	0
	0%	0
<b>% Produce Donated</b>		
	100%	0
	75%	0
	50%	3
	25%	6
	0%	0
<b>% Produce Thrown Away</b>		
	100%	0
	75%	0
	50%	3
	25%	7
	0%	7

**Table 7: Themes and Key Quotes From Interview Participants**

<b>Themes</b>	<b>Subthemes</b>	<b>Quotes</b>
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<b>Food Access Changes Throughout the Semester</b>	
	<b>Perceived Lack of Time</b>
	<i>Yeah, so when I'm busier I tend to just not go to the grocery store. -P10</i>
	<i>If I have like work for a long time or haven't been able to just because of classes so it's like buying like canned foods -P6</i>
	<b>Academic Workload</b>
	<i>I'm mostly just trying to survive in the middle of December or whenever the semester ends, that's how I would describe it -P1</i>
	<i>Obviously with school work and research during busy weeks it's like okay I'm going to eat spaghetti again just because it's quick and easy -P16</i>
	<b>Changes in Employment</b>
	<i>After being on campus for a few months and not always being able to work as often as I want to I found that I was trying to like buy the cheapest option available even if something was cheaper and less nutrient-dense -P6</i>
	<b>Weather</b>
	<i>In the winter it kind of deterred me from either being able to go to the store because I had other homework to do or I just don't want to go because it was cold so that definitely limited my supply of food and healthier foods. So yeah just the stress of that. -P4</i>
	<i>Theres a lot more farmers markets in rhode island There is a New Hampshire so I was trying to go in like see all them to get like produce but then as it was getting colder and they were</i>

	<p><i>shutting down I thought we were going to the grocery store more often as well as there's like certain like small stores on campus but usually like the grocery stores are mostly used after that now it's because it's so cold out it's definitely most of the grocery store -P6</i></p> <p><i>Honestly, sometimes, up here I don't really like the snow. I don't really like the pouring rain. I will not go out. -P21</i></p>
	<b>Mental Health</b>
	<p><i>Yeah probably in the beginning of the semester I wasn't eating out at all because like I mentioned I was able to get to the grocery store but definitely now I have to get more dining dollars I noticed I've been using those a lot more frequently now that I'm stressed and I'm like oh I need something to eat and then I'm just kind of swiping with the dining dollars or I could go run and get a Subway sandwich or something. So definitely now that it's the end of the semester I'm thinking about exploring those options more -P4</i></p>
	<b>Commuter Student Barriers</b>
	<p><i>I try to not eat as much around campus because it's a lot of money. I try to think about bringing food from home but the most I can do usually is just some fruit and a protein bar and a water bottle I have to refill constantly -P1</i></p> <p><i>If I can find food on campus i'll typically get it out there its just really expensive to get food out there and the closest wendys is like 20 miles away so i would have to plan it in advance its not like providence where you can walk to get a quick bite to eat somewhere -P1</i></p>
<b>Motivation to Participate</b>	
	<b>Free Food</b>
	<p><i>I guess I could say for all college students they're never going to say no to free produce because it</i></p>

	<p><i>can be very expensive and you don't always even get access to that even at the going to a regular grocery store or if you have to live on campus you definitely don't have access to most of those things -P6</i></p>
	<p><i>Free produce. I wanted some veggies. I don't really buy a lot of veggies. So just having an option to get free produce was really motivating. -P22</i></p>
	<p><i>I think it was just some, obviously free things to be honest, are rather appealing. -P23</i></p>
	<p><i>I think it's a really cool concept because fresh veggies are not super cheap. -P8</i></p>
	<p><i>Mainly the free produce. I just really, like I said produce is expensive and we're graduate students and it just seemed like a really good decision -P10</i></p>
	<p><i>I guess I could say for all college students they're never going to say no to free produce because it can be very expensive -P6</i></p>
	<p><i>I really like getting free produce. I thought it was a really helpful thing to have on campus instead of going all the way to like, stop and shop to get it -P13</i></p>
	<p><b>Fresh Food</b></p>
	<p><i>I'd say that the biggest hurdle for me in getting fresh food and vegetables, and healthy food is time; and even though that line took 15 min, it's much much shorter than me having to go to the local supermarket. -P17</i></p>
	<p><i>Having access to like the fresh produce is really nice to have and you don't always even get access to that even at the going to a regular grocery store or if you have to live on campus you definitely don't have access to most of those things -P6</i></p>

	<p><i>Fresh produce you don't get that easily on campus unless you like drive to the grocery store because we don't really have any access to a grocery store here um like no fresh produce or anything unless you go to the little store, I forgot what it's called, the little Store near the dining hall but they only have like eggs and bacon and stuff but no like vegetables you know what I mean -P5</i></p>
	<p><b>Desire to Try New Foods</b></p>
	<p><i>I've always liked trying new things, my mom always taught me to try new things and I might like it even though I might be kind of adverse to it at first. They had a small, itty bitty butternut squash and I was like sure I'll take it and if I don't want to eat it, I'm sure my roommates will eat it. I made home fries with it and I liked it a lot. -P4</i></p> <p><i>Well, I'm not a particularly picky eater. So, if the opportunity is , I'm, I'm usually more prone to just trying things. Out of curiosity. -P23</i></p> <p><i>I wanted to see what I could do with it, I guess. Just like again, just like to have fresh produce. Which I again, just don't really have access to normally. -P12</i></p>
<p><b>Participant Need For Nutrition Education</b></p>	
	<p><b>Produce Preparation Resources</b></p>
	<p><i>I remember, I think I got this flier last year from the market. I think it was '20 Ways to Incorporate More Vegetables and Fruits into Your Meals'. I think packets like that are super helpful. Especially for people who are not as good at cooking, who maybe want some ideas to try out. Just ways to incorporate fruits and vegetables into your meals, I feel like would be super helpful. -P22</i></p>

	<p><i>And I'd rather know, like just in general, how to cook specific things, and like, maybe an idea of how to use that, or like, say it was like, oh, here's eggs. Here is how to cook them, and here's a few meals that you could have with them -P20</i></p>
	<p><i>Yeah, like little tips like it doesn't have to be like the super specific, or like, really general. I think like a variety would be nice for like different types of people -P21</i></p>
	<p><b>Direct Education: Cooking Classes</b></p>
	<p><i>Yeah so I definitely think more education around the produce is really important. I mean, I feel like only like people that major in nutrition really understand all of like what's happening, or there's so much false information being spread around all this food so I think a mix of knowing how to cook it and what it's good for is important -P6</i></p>
	<p><i>Cooking classes would be great. I feel like I would love to do cooking classes because I'm not the greatest cook. I just simply follow what the recipes say but I want to be more creative -P2</i></p>
	<p><b>Food Safety and Storage Resources</b></p>
	<p><i>I'm always confused on where to store stuff. -P22</i></p>
	<p><i>Yeah, I think so. I mean, and especially because I have friends and stuff, too, who don't have fridges, or and sometimes they don't, they probably don't put it in the fridges right away. So, I think it could be helpful, especially for prolonging the lifespan of food. -P23</i></p>
	<p><i>I would have liked to know how to store it, because I just wrapped it in a paper towel and hoped for the best basically -P10</i></p>
	<p><i>It could be especially for someone who did not watch their parent cooking growing up or didn't have that to go off i think it could be beneficial for them -P4</i></p>



Positive FFM Perceptions	
	<p><i>It was good, everyone was just super nice. I like when you had someone bringing apples down the line because then you were able to talk to them and be like 'oh what produce do you have?' and I had a lot of good conversations with the volunteers that were doing that. I don't know, I enjoyed it I thought it was really cool and helped a lot of people kind of explore food and have access to food and I know a lot of the freshman really enjoyed it because they can't go off campus a lot of the time so have access to that food was really good for them . I thought it was amazing, if you guys did it again, I won't be here because I'm graduating but I recommended it to all my friends and everyone knows that I love the farmers market. I think it was really great, thank you guys so much -P4</i></p>
	<p><i>I love the Farmers' market. It's like my favorite thing. I get so sad when it ends. And yeah, it's been super helpful for me. It's even so fun to just get fresh food. The eggs taste so good, the tomatoes are probably the best tomatoes I've ever had, and it's just fun to be like 'Oh, this is like from Rhode Island, this is such a close farm', and you know where it's coming from, and you know it's fresh -P20</i></p>
	<p><i>I was super thankful for it, and I hope you guys continue to do it because it really helped me out with my grocery shopping and stuff like that. I didn't have to worry about produce as much and that can get kind of pricey. So, I really appreciated it. Also, all of the veggies were delicious. I used the eggplant. I forgot about this. I made fried eggplant with my boyfriend one time. It was so good, so good. So yeah, I'm just really thankful for the Free Farmers Market. And thank you guys, for everything you do. It's really helpful -P22</i></p>
	<p><i>I thought that it was really cool. I never, honestly, probably would have gone to the farmer's market if I hadn't been there volunteering. And that's not</i></p>

	<p><i>like, that's only because I have access to like fresh produce for free basically already. So even when I did take a bag from the farmers market, I felt bad because I was like, I could get this at work. But it was just really cool, I think it's a great thing to do on campus. And yeah, like as a student, that's just like especially if you're living on campus. Because that would really reduce your access to fresh produce, especially if you're, if you don't have a car and you're on campus in your dorm room. So, I think it's just a really cool thing. -P8</i></p>
	<p><i>I've always had a really good time at the market. No, I told all my roommates because I came home with the bag, and they were all interested. So yeah, I like that. I definitely like that. Instead of going to the grocery store that I know it's local, and how they're all shaped and like different. So I just had an overall positive experience. The line wasn't too bad. -P19</i></p>
	<p><i>I think it's a really cool thing, like providing wide access to fresh fruits and vegetables to students. And yeah, keep doing what you're doing. It's really enjoyable and nice. It's appreciated. -P23</i></p>
	<p><i>Yeah, so I really liked it. I really loved the idea of getting free produce, because like I said it's expensive and it was just kind of a nice treat, like being able to get healthy food and not have to pay for it, if that makes sense. I also really liked the idea that it was coming from like the farm on campus, as well. It felt like, very like, I don't know, fancy. I don't know how else to explain it. But yeah, I really like the experience. I really liked being able to get the produce for free and I really liked being able to use it to get creative with cooking -P10</i></p> <p><i>No, I felt , maybe perhaps, that as a neighbor to the University. Maybe I wouldn't be welcome at the farmers market, but when I got there. They were really happy to see anybody there. So I was. I was very thankful about that. not being a</i></p>

	<p><i>student, that, not being a student, I felt kind of. I was kind of worried that maybe I was taking away resources from the students. But when I got there they're very happy. very happy to see me, and very giving. -P18</i></p>
	<p><i>I think it was a good way to still have access to good food especially with how prices at the market are going up and even regular farmers have to make everything go up -P1</i></p>
	<p><i>I thought it was great. It was. It's a nice thing that you do. I will say that nobody else in my department had heard of it. So, when I came back with veggies they were all jealous and they didn't read their newsletters I guess. I told them about it, and they were all excited, but it was, I think it was one of the last ones -P11</i></p>
	<p><i>I just love it. It's the thing like, when I first found out it was a thing, I was like, that's so cool like. It's accessible for everyone to like, because it doesn't matter if you're on campus, off campus, have a meal plan, don't have a meal plan, can cook, can't cook. Like I just, I love the idea. I didn't know it existed, but it's really awesome. -P12</i></p>
	<p><i>"I will be back next fall because I love it, and I really appreciate everything that you guys do -P13</i></p>
	<p><i>It's such a good organization being able to provide more information or that would help like either have make like a different time or like expand the time that it's open so that more people have access to it and I just think it's a good organization where it's providing basically free produce to students that probably have never seen or cooked with the before -P6</i></p>
	<p><i>I thought it was great and it was a great way to get people to meet each other and I know we talked to kids as they were in line and they also were doing the meter where they were testing it was pretty much how many greens you had right and it's a good way to get</i></p>

		<i>the kids to maybe stop whatever they're doing they're under a lot of stress or whatever and just like go out Mingle for a little bit grab some food that then you won't have to buy you know and it brings the community together a little bit Yeah I was always wondering is it okay like I know you say you're inviting like the students and the staff but do you really want staff there do you know what I mean or are you really just trying to access it to the students do you know what I mean -P7</i>
		<i>I just think its a really great thing like i love going there it's the highlight of my thursday -P2</i>
		<i>I loved it. Again i'm a sucker for anything free but i think it's really, it had that feel good appeal and everyone loves fresh food -P16</i>
		<i>Keep it up guys please keep giving me free vegetables yeah that's about it I really enjoy the market actually I didn't know how much it had an impact on me I feel like every week I just base my meals um on whatever vegetables and stuff I got -P5</i>
		<i>I think it's a really cool concept because fresh veggies are like, it's not super cheap. I work on a farm, so I have an appreciation for the whole process of growing food, so I just think it's a really cool thing to do at URI. -P8</i>
<b>Potential Future Changes Based on Student Need</b>		
	<b>More Variety</b>	
		<i>I think maybe more fruit variety would be nice because fruits i can easily eat without preparing it -P1</i>
		<i>If you had spices that would be great. -P22</i>
		<i>Maybe cinnamon could be good for the fall, to cook with -P14</i>

		<i>I think the ingredient i always use is garlic and onions i think those would be great -P2</i>
		<i>Maybe like more exotic types of herbs or spices that not many people know about that can really change the flavor of food. Whether it's like you roast some food, have herbs inside that you put on like, change it a lot. So maybe something like that. -P12</i>
		<i>If you guys could start doing things like spices and stuff like that, I feel like that would be great, too, because that's something I always want to get from the grocery store, but never do. -P21</i>

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## **APPENDIX A**

### EXTENDED LITERATURE REVIEW

#### *Introduction*

This literature review aims to comprehensively explore the issue of food access among college students. Specific attention will be given to the unique measurement challenges faced by this demographic and the existing policy solutions and interventions designed to address food access issues on college campuses. By synthesizing evidence from diverse disciplines, this review seeks to uncover the multifaceted factors contributing to limited food access and food insecurity among college students and identify avenues for future research. Furthermore, it emphasizes the importance of qualitative research methods in understanding the lived experiences of college students and evaluating the effectiveness of interventions from their perspective. Ultimately, this review aims to contribute to the discourse on food access needs in higher education and provide insights to support interventions and policies aimed at fostering food access and equity among college students.

### ***Prevalence of Limited Food Access Among College Students***

Food access refers to the stable availability of accessible, affordable, and suitable foods, whereas food insecurity refers to the condition of lacking regular access to these types of foods or ability to acquire acceptable foods in socially acceptable ways due to a lack of money or other resources.<sup>1</sup> The connection between food access and food insecurity is important as food insecurity arises from limited food access. Therefore, addressing issues of food access is crucial in the ongoing discussion of food insecurity within college students. Existing literature suggests that the prevalence of food insecurity ranges from 12.5-84% on college campuses which



suggests a lack of accuracy when assessing this problem.<sup>2</sup> Prior to the COVID-19 pandemic, 42% of college students reported experiencing some level food insecurity globally.<sup>3</sup> The COVID-19 pandemic had a profound impact on health-related needs security for the general population and continues to affect both individual and community health and disproportionately affected those already facing hardships.<sup>4</sup> This population may be more susceptible to challenges to food access than the general population due to limited financial resources, decreased buying power of federal aid, and rising costs of tuition, housing, and food.<sup>5</sup> According to the current literature, those college students are more likely to be Black, Hispanic, Asian, or biracial, low-income, employed, and housing insecure.<sup>6-10</sup>

### ***Consequences of Limited Food Access in College Population***

Students experiencing challenges with food access are more likely to self-report their general physical health status as poor compared to their food secure peers.<sup>10</sup> While there is a perception that being food insecure contributes to a lower BMI due to less food access, having a higher BMI is more likely due to increased consumption of energy-dense foods and metabolic disruptions connected to inadequate nutrition and episodic undereating.<sup>11,12</sup> Lower fruit and vegetable consumption,<sup>13,14</sup> and increased intake of added sugars, specifically from sugar sweetened beverages such as energy drinks, sports drinks, and sweetened teas are also reported in this population.<sup>15</sup>

In addition to weight-related health outcomes, college-age individuals, particularly women<sup>15</sup>, with a history of food insecurity have shown higher levels of disordered eating.<sup>16,17</sup> This is perpetuated by the “feast or famine” mentality determined by food availability.<sup>18,19</sup> Physical activity is another factor that can exacerbate these weight related outcomes for students. Decreased rates of physical activity are reported in students who face food access challenges, however, the reasoning for this has yet to be fully investigated.<sup>15,16</sup> Students experiencing these challenges are also more likely to report poor sleep quality or sleep complaints compared to their food secure peers.<sup>20</sup>

In addition to physical health outcomes, limited access to food is also associated with negative mental health outcomes including symptoms of depressive and anxiety related disorders.<sup>17</sup> Other outcomes such as languishing, perceived need for help, loneliness, and self-injurious behaviors are reported.<sup>18,19</sup> While the pathways to explain these associations are still being investigated, it is likely that limited food access reflects the presence of other social determinants of health that intertwine with mental health.<sup>19</sup> There is also an association between food insecurity and poor academic performance.<sup>21</sup> These students are more likely to report lower GPA when compared to students who are food secure.<sup>5,22</sup> However, it has been noted that GPA may not be the only indicator of the academic impact, and that discontinuous enrollment and attenuation of academic goals should also be explored.<sup>24</sup>

### ***Measurement of Food Insecurity Among College Students***

While there are currently several tools used to assess food access level, a majority of these measures assess household food security status, and there are no validated measures specifically for college students.<sup>23</sup> Questions framed from the household level may not apply to college students as the unique living arrangements for this population varies from the typical household. Additionally, many of these tools use a recall time frame of the past year, however, student circumstances and experience with food access can vary greatly based on fluctuations within the academic calendar.<sup>17</sup> Studies have shown that this population does not respond to the gold standard measures in the same way as other adult populations.<sup>24</sup> This phenomenon could be explained by the fact that finances are often not the only factor contributing to food access challenges in college students.<sup>25</sup> For example, time scarcity is very prevalent for college students and time management may play a unique role in their experience of accessing food.

### ***Policy Solutions to Improve Food Access***

The Supplemental Nutrition Assistance Program (SNAP; formerly known as the food stamp program) is a federal food assistance program that promotes food access. While eligibility criteria for SNAP generally excludes individuals between the ages of 18 and 49 and enrolled at least half-time at an institution of higher education,

students can meet exemptions to be considered an eligible student. There have been recent efforts to expand SNAP access for college students including pandemic related expansions to SNAP eligibility. This expanded eligibility to students whose expected family contribution was zero dollars and those who are eligible but not necessarily able to participate in federal or state work-study programs.<sup>26</sup> However, these changes expired with the expiration of the federal state of emergency.<sup>26</sup> Proposals to make these temporary expansions to eligibility permanent have been introduced in the House and the Senate in 2021.<sup>27</sup> In California, a law implemented in 2017 mandated that colleges with eligible food service facilities must apply to participate in the *Restaurant Meal Program*. This program allows some SNAP recipients to use their benefits in participating restaurants.<sup>28</sup> Despite these, there is a lack of education in regards to eligibility and a social stigma surrounding accepting assistance. Furthermore, the SNAP application process is generally lengthy and difficult, limiting participation even among college students that do qualify for SNAP.<sup>29</sup> <sup>30</sup>

### ***Interventions to Improve Food Access Among College Students***

In response to limited food access in this population, many institutions have begun to implement programs to address this issue.<sup>20</sup> Among these programs, the most common form of emergency relief has been meal voucher programs and food pantries.<sup>20</sup> Meal vouchers are used to provide students with free or subsidized food options in campus dining locations and are funded through the college itself or from

students who can choose to donate unused meal-plan meals through “swipe card” programs. Swipe Out Hunger is a national organization that utilizes these swipe card programs to connect students in need with meals on campus.<sup>31</sup> A study investigating the implementation of a similar meal voucher program found that the program had contributed to participants' improved academic outcomes and emotional wellbeing.<sup>32</sup>

While a large proportion of universities offer food pantries, where students can pick up free food that has been donated from the community, many students report a social stigma attached to food pantry use or a sense that it is not intended for them to use<sup>33</sup>, leading to limited utilization among this population. Access barriers such as limited hours, regulated frequency of use, and lack of knowledge on the logistics of its use have also been reported.<sup>18</sup> Furthermore, food pantries are traditionally set up to address acute or episodic food insecurity, and are not designed as a solution to chronic hunger, which is typically reported in college students.<sup>34</sup> Food pantries are also often limited to canned or non-perishable items, which are both unattractive to users and not nutritionally adequate for regular consumption.<sup>35</sup>

To promote access to fresh produce, some institutions have begun to implement campus gardens or low-cost or no-cost farmers markets for those in need.<sup>36</sup> These interventions and their availability, as well as perceptions, use, and implementation on college campuses remain missing from peer-reviewed research.<sup>20</sup> A primary barrier to interventions including low-cost or no-cost farmers markets to food

insecurity for college students, is inconsistent administration and funding. Many of these campus-based programs are student-driven and can diminish or fall into disorder as student leaders graduate or move on.<sup>20</sup> While student involvement can be important, some level of staff involvement is crucial to the success and sustainability of these programs.<sup>37,38</sup> Very few programs have allocated budgets to support programs and therefore are typically funded through an assortment of funding mechanisms, including grants, governmental funds, student fees and donations.<sup>20</sup> This type of funding can be inconsistent and temporary, which can impact the programs long term viability and potential to meet the demands of student needs.<sup>37,38</sup> There is also a lack of literature that evaluates the reach, impact, and efficacy of programs.<sup>39</sup> This suggests a need for higher levels of monitoring and assessment of interventions aimed at decreasing food insecurity on college campuses. Importantly, qualitative research is needed to evaluate student use, perceptions, and attitudes towards these programs and effectively evaluate impact on student food access.

### ***Qualitative Research***

Qualitative research is broadly defined as a naturalistic approach that seeks to understand phenomena in uncontrolled, context-specific settings.<sup>40</sup> This approach produces findings that would otherwise not be obtained from standard statistical procedures or other means of quantification.<sup>41</sup> The purpose of qualitative research is to determine the meanings people give to their experiences.<sup>42</sup> A common method of

qualitative research is the use of semi-structured interviews, which involve an interview guide containing open-ended questions that can be answered in regards to a limited list of topics. This method has the advantage of being reasonably objective while still allowing for a deeper understanding of the respondents opinions and reasoning behind them.<sup>42</sup>

## **APPENDIX B - ADDITIONAL METHODS**

### **URI FREE FARMERS' MARKET PROGRAM DEVELOPMENT**

The concept of the URI FFM began with the excess produce at the URI Teaching Garden, an experiential education and research garden at the farm lands at the university that is overseen by plant sciences research faculty. Produce is grown at this garden for research and coursework as a way for students to understand the process of growing as part of the food system. Without student-based gleaning efforts, the produce would not be distributed and therefore, be wasted. The URI campus

dietitian was responsible for making the first connection between the excess produce and students in need. The idea for this program was to be able to distribute produce to students at no cost, making it accessible both location-wise and financially. The URI FFM is supported by the URI Teaching Gardens and Farms, Health Services, Department of Nutrition and Food Sciences, Dining Services and Cooperative Extension. Faculty, staff, and student volunteers are encouraged to attend gleaning sessions at the farm once a week to harvest produce throughout the fall semester. This produce is provided to the market, which is held once a week and distributed by volunteers at various locations throughout campus the following day prior to harvesting.

The pilot phase of FFM started in Fall of 2021 on a small scale and continued in the Fall of 2022 where over 5,000 pounds of produce was distributed to students each year. Over the past two years data has been collected via survey from nearly all students that have attended the FFM. The survey included questions about demographics, characterization of the student population, food security risk, and use of campus resources. The survey was coordinated with a non-invasive skin measure that evaluates skin carotenoids, which are a general marker of fruit and vegetable intake status.<sup>43</sup> Survey data from this year (2022) indicated that 39% of respondents reported risk of food insecurity.<sup>45</sup> However, utilization of university health, social, and financial resources among participants was low. Preliminary results from survey respondents showed students at risk for food insecurity was associated with having 53.5% lower dermal carotenoid score, as measured by an objective skin measurement



tool, Veggiemeter.<sup>44</sup> This suggests that those at risk for food insecurity are consuming less fruits and vegetables than their food secure peers.

**APPENDIX C**  
**MARKET SURVEY**

What is your URI ID number?

NOTE: This number will NOT be linked to your personal information. It will only be used to track your visits to the Free Farmers Market.

Check the race category you identify with

(select all that apply):

- American Indian, Alaskan Native, or Indigenous
- Asian
- Black or African American
- Native Hawaiian or other Pacific Islander
- White
- Prefer not to say

Check the ethnicity you identify with:

- Hispanic/Latino
- Non-Hispanic/Non-Latino
- Prefer not to say

Which of the following best describes your gender identity?

- Woman
- Man
- Non-binary
- Prefer to self-describe:
- Prefer not to say

Which of the following describe(s) you?

(select all that apply)

- First generation college student (have/had no parents/guardians complete a Bachelor's degree)
- Transfer student
- Participate in or qualify for Work Study
- Ever received the Federal Pell Grant
- Identify with a Native American or Indigenous Tribal Group (please specify below)

None of the above

Where are you living during this academic year (2021-2022)?

- On campus
- Off-campus
- Unstable situation/unhoused
- Prefer not to say

Have you used the Free Farmers Market before (during the current academic year, 2022-2023)?

- No, this is my **first** time
- Yes, I have already used the Free Farmers Market this year

Did you use the Free Farmers Market last year (2021-2022)?

- No
- Yes

Do you currently use, or have you ever used, any of the following campus resources?

(select all that apply)

- Rhody Outpost (campus food pantry)
- Counseling Center
- Campus Recreation Center (Anna Fascitelli Fitness & Wellness Center)
- None of the above
- Prefer not to say

Qualtrics Survey Software

Was that often true, sometimes true, or never true for your household in the last 12 months?

- Often true
- Sometimes true
- Never true

"The food we bought just didn't last, and we didn't have money to get more."

Was that often true, sometimes true, or never true for your household in the last 12 months?

- Often true
- Sometimes true
- Never true

Are you interested in any FREE nutrition education that may be offered by the University of Rhode Island in the near future?

- Yes
- No
- Not sure

Please rank how much you agree or disagree with each statement about the Free Farmers Market below.

	Completely disagree	Disagree	Neither disagree nor agree	Agree	Completely agree
The Free Farmers Market meets my approval.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Free Farmers Market is appealing to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like the Free Farmers Market.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I welcome the Free Farmers Market.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please add your email below if you'd be willing to be contacted to talk more about your Free Farmer's Market experience. We will provide a gift card as a thank you for your time!

## APPENDIX D

### PRE-INTERVIEW SURVEY

Which of the following best describes you?

- Undergraduate student, please specify what year:
- Graduate student
- Other, please specify:
- Prefer not to say

What is your URI ID number?

NOTE: This number will NOT be linked to your personal

Qualtrics Survey Software

information. It will only be used to understand your participation in the Free Farmers' Market

Check the race category you identify with

(select all that apply):

- American Indian, Alaskan Native, or Indigenous
- Asian
- Black or African American
- Native Hawaiian or other Pacific Islander
- White
- Prefer not to say

Check the ethnicity you identify with:

- Hispanic/Latino
- Non-Hispanic/Non-Latino
- Prefer not to say

Which of the following best describes your gender identity?

- Woman
- Man
- Non-binary
- Prefer to self-describe:
- Prefer not to say

Which of the following describe(s) you?

(select all that apply)

- First generation college student (have/had no parents/guardians complete a Bachelor's degree)
- Transfer student
- Participate in or qualify for Work Study
- Ever received the Federal Pell Grant
- Identify with a Native American or Indigenous Tribal Group (please specify

Where are you living during this academic year (2022-2023)?

- On campus
- Off-campus
- Unstable situation/unhoused
- Prefer not to say

Did you use the Free Farmers Market last year (2021-2022)?

- Yes
- No

Do you currently use, or have you ever used, any of the following campus resources?

(select all that apply)

- Rhody Outpost (campus food pantry)
- Counseling Center
- Campus Recreation Center (Anna Fascitelli Fitness & Wellness Center)
- Campus Registered Dietitian
- Prefer not to say
- None of the above

In these next questions, we want to learn more about how you purchase and use your food.

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Qualtrics Survey Software

- A family member
- Partner/significant other
- Other

To what extent do the statements below apply to you?

"I worried whether my food would run out before I got money to buy more."

Was that often true, sometimes true, or never true for you in the last semester?

- Often true
- Sometimes true
- Never true

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

Was that often true, sometimes true, or never true for you household in the last semester?

- Often true
- Sometimes true
- Never true

"I couldn't afford to eat balanced meals."

Was that often true, sometimes true, or never true for you household in the last semester?

- Often true
- Sometimes true
- Never true

Within the last semester, did you ever cut the size of your meals or skips meals because there wasn't enough money for food?

- Yes



---

Within the last semester, did you ever eat less than you felt you should because there wasn't enough money for food?

- Yes
- No
- Unsure

Within the last semester, were you ever hungry or didn't eat because there wasn't enough money for food?

- Yes
- No
- Unsure

Thank you for completing the survey. By clicking the link below you will be directed to a separate page to add your name and email to provide times to schedule a virtual interview lasting 20-30 minutes. This will ensure that your responses on this survey are not connected to your contact information. As a thank you for your time participating in both this survey and interview, you will receive a \$25 Amazon gift card.

Please complete the form below and then hit 'Complete' on the survey.

**Free Farmers' Market Interview  
Interest Form**

The form Free Farmers' Market Interview Interest Form is no longer accepting

## APPENDIX E

### INTERVIEW TEMPLATE

#### Appendix ii: Interview Template

#### INTERVIEW TEMPLATE

Thank you again for taking the time to meet with us. We want to speak with you about your experience at the Free Farmer's Market including topics like food access, food resource management, and preparation resources. I expect the interview to take approximately 20-30 minutes. Feel free to let me know if you need to pause or take a break at any time.

Before we get started, do you have any questions for me?

1. Where did you hear about the Free Farmers' Market?
2. What motivates you to stand in line for the Free Farmers' Market each week?

#### [FFM PRODUCE USE]

*Transition: I would now like to move on to some questions related to your experience at the Free Farmers' Market.*

[AS NEEDED ASK FOLLOW-UP QUESTIONS: 'Could you say more about that?'; 'What do you mean by that?']

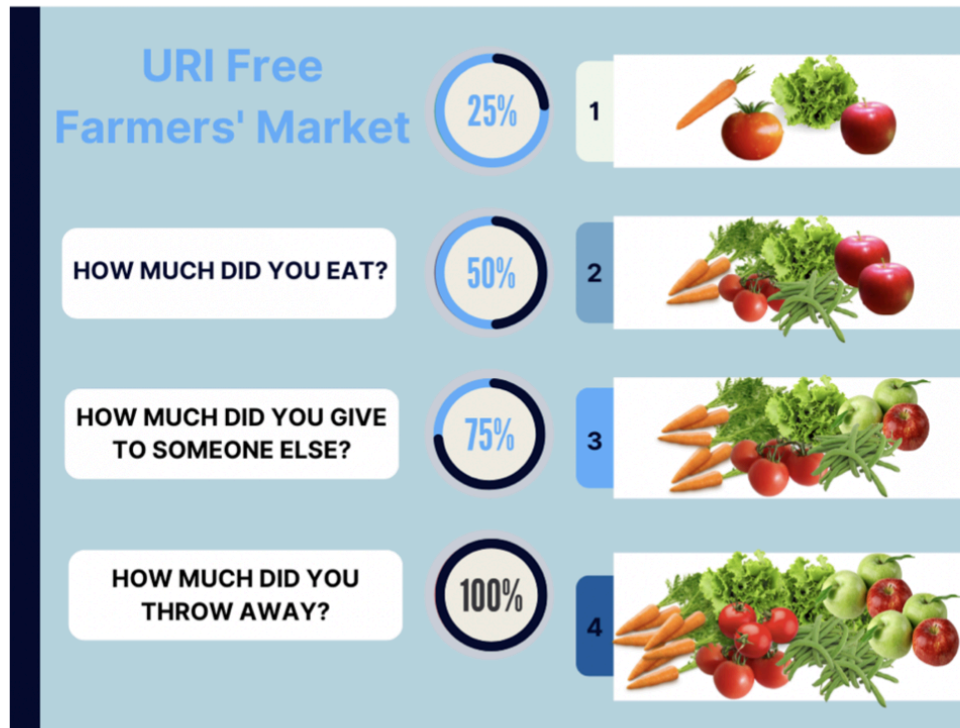
#### **Can you share with us what type of produce you typically take home from the Free Farmers Market?**

- a. Do you find yourself taking the same things every week or do you try new things?
- b. What new things do you try?
- c. What motivated you to try something new?

#### **What do you do with the produce you take home from the Free Farmers Market? Probes & visual aid (as needed):**

- a. How much of the produce do you eat each week?
- b. How much of the produce do you cook?
- c. How much of the produce do you throw away each week?
- d. How much did you give away?

*[We are trying to best understand how to serve students, it's okay to be honest!]*



**[FFM PRODUCE USE: Food Resource Management, Cooking Equipment/Resources]**

*Transition: Thank you. Now I'm going to ask some questions about your access to food preparation methods and storage.*

[AS NEEDED ASK FOLLOW-UP QUESTIONS: 'Could you say more about that?'; 'What do you mean by that?']

**Can you describe the space in your dorm or house where you prepare the food you take from the Free Farmers Market?**

- a. Is this a shared space like a resident building kitchen? Or your kitchen at home?
- b. What type of equipment do you have access to? Sink, oven, stove, etc.?

- c. How do you typically store your food?

**[FOOD ACCESS]**

*Transition: First, I'm going to ask some questions related to how you experience food access during the school year. Before we begin, food access refers to the accessibility to adequate resources for acquiring appropriate foods to meet your dietary needs.*

[AS NEEDED, ASK FOLLOW-UP QUESTIONS: "Could you say some more about that?"; "What do you mean by that?"]

**How do you feel resources on and off campus meet your dietary needs?**

- a. Can you please describe where you typically access foods/meals/snacks during the semester? Grocery store, prepare at home? Buy on campus? Order out/delivery?
- b. How often do you get food from the grocery store, on campus, delivery etc.?

**How does your level of food access change from the beginning, to middle, to the end of the semester?**

- a. How do you feel about the quality of the foods you access on and off campus? Does this change throughout the semester as well?
- b. What effects these changes? School work, time, money, other?
- c. How does this make you feel?

**[FFM PARTICIPANT NEEDS:...]**

**What types of information or resources would help you best use the produce you get from the Free Farmer's Market?**

- a. What type of recipes/ instructions for food preparation would help? Specific recipes, meal plans, etc.?
- b. What kitchen tools would help you prepare more food?
- c. What incentives could make preparation more successful - education session, additional ingredients, other?

**[WRAP-UP]**

**Before we finish up, is there anything else you'd like to share with us that wasn't discussed today?**

**Is there anyone else that you would suggest that we speak to surrounding the topic of food access on our campus?**

*Thank you for participating in this interview. We appreciate your time and honest responses.*

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