

Food Insecurity Challenges and Coping Strategies: A Survey and Podcast Ethnography of International Graduate Students at a U.S. Land Grant University

Alice Akers, University of Florida
Caroline Nickerson, University of Florida
Caitlin Lunzmann, University of Florida
Madison A. Dymant, New Mexico State University
Jaime Loizzo, University of Florida

International graduate students in the U.S. are known to face financial challenges, which can lead to food insecurity. Our investigation of these students' experiences at a land grant university identified challenges and possible solutions. Quantitative objectives were: 1) identify financial pathways, 2) describe barriers to food purchasing, and 3) explore experiences of food insecurity. We surveyed 54 students using questions modified from the U.S. Food Security Module and created a podcast series to explore seven in-depth student experiences. The majority of participants had an annual household income less than \$25,000 and typically did not engage in negative food consumption behavior. There was a significant correlation between food insecurity and income, with an increase in income related to a decrease in food insecurity. We found that the international graduate students needed support, both financially, and through expanded community support, such as a knowledgeable student advisor and relaxed student visa restrictions. Qualitative podcast ethnography results also indicated limited stipend incomes caused international students to face financial stress for food, school, and healthcare costs (Theme 1) and participants recommended increased financial support, food access, and culturally appropriate food options (Theme 2).

Keywords: food insecurity, international graduate students, student and exchange visitor program, podcast ethnography

Introduction

The United States has a large population of international students, with more than 1.5 million active non-immigrants registered in the Student Exchange Visitor Information System (U.S. Immigration and Customs Enforcement, 2024). International students are considered non-immigrants because their primary purpose for being in the country is to complete a program of study at a Student and Exchange Visitor Program (SEVP) certified school, as defined by the Department of Homeland Security. After degree program completion, nonimmigrants are expected to change their U.S. citizenship status or return to their home country.

In 2020, international students from 226 countries pursued 5,288 different primary majors at U.S. colleges and universities (NAFSA: Association of International Educators [NAFSA], 2021). The students contributed \$42.9 billion to the U.S. economy during the 2023-2024 academic year and supported at least 355,000 jobs (NAFSA, 2025), yet most international students studying within the U.S. have experienced financial problems (dos Santos Bicudo, 2024; Li & Kaye, 1998; Roberts et al., 1999; Poyrazli & Grahame, 2007; Taborda, 2020).

Researchers identified immigration regulations as a cause for international students' financial challenges (Baba & Hosoda, 2014; Thomas & Althen, 1989; Yingyi et al., 1995). Employment opportunities for international students are restricted to their school, and financial aid opportunities are often limited (Eland & Thomas, 2013; Thomas & Althen, 1989; Trice, 2003). F-1 visa international students are restricted to 20 hours of work per week at a campus job during the academic term (U.S. Immigration and Customs Enforcement, n.d.). Financial instability can lead to a college student's inability to access and purchase nutritious food, resulting in food insecurity (Loofbourrow & Scheer, 2023; Shi et al., 2021).

Food insecurity is described as a limited availability of quality food because of inadequate resources (Gao et al., 2009; Slopen et al., 2010). Food insecurity contributes to nutrient inadequacy, obesity, anxiety, depression, and suicide (De Haen et al., 2011; Gao et al., 2009). International students tend to be more vulnerable to food insecurity than their domestic peers (Bottorff et al., 2020; El Zein et al., 2018; Soldavini et al., 2022). Therefore, it is imperative to investigate international students' food insecurity experiences.

Prior research has indicated several factors can lead to food insecurity for international student populations. Shi et al. (2021) conducted a comprehensive literature review on the dietary practices of international students in their host countries that included 30 articles reporting struggles with dietary changes, 12 articles reporting international students adapting to host food culture, and six identifying higher food insecurity in international student populations. Although other individual case studies have also been conducted about this issue, there is a gap in research surrounding solutions for food insecurity among the international student population. Food access, consumption, and dietary practices can be tied to cultural identity and important to international students' adjustment to their host institution (Brown, 2016; Pilli & Slater, 2021). Additionally, international students may be hesitant to communicate their experiences and food needs as they transition to fitting within a dominant culture different from their own (Özturgut &

Murphy, 2010; Poyrazli & Grahame, 2007). Hence, the aim of this study was to identify possible solutions and interventions to help reduce international students' food insecurity.

Theoretical Framework

The Spiral of Silence Theory guided the study (Noelle-Neuman, 1991). The theory assumes people are constantly aware of the opinions of others around them and adjust their behaviors to align with majority trends under the fear of being on the losing side of a public debate (Ho et al., 2008). An individual is more likely to go down the spiral if their opinion does not conform with the majority opinion that is perceived (Noelle-Neumann, 1993).

As a nonimmigrant living in a foreign country, an individual could be more likely to experience their opinions as being different from the majority. These differences in culture and worldviews can cause a spiral of silence where international students feel unable to speak up, especially within classrooms full of domestic students. In the United States, Lee et al. (2004) found that people who are outspoken are considered competent, friendly, and intelligent. However, in some cultures, when an individual is outspoken, it could be seen as a negative trait that violates social norms. How a behavior is perceived in one's social context plays a role in an international student's willingness to express their opinion publicly (Lee et al., 2004). This phenomenon is applicable to international students' food insecurity experiences. Therefore, our study operationalized the Spiral of Silence Theory to international students remaining quiet about their food insecurity experiences, as opposed to perceived public opinion that food insecurity is minimal in the larger context of a U.S. land grant university.

Purpose and Research Objectives/Questions

The purpose of our study was to explore international graduate students' food insecurity experiences at a U.S. land grant university. The following research objectives (ROs) guided the survey:

RO1: Determine international graduate students' living status, including a) income, b) type of housing, and c) modes of transportation.

RO2: Determine budget impacts on international graduate students' recent food consumption behaviors.

RO3: Examine international graduate students' overall food insecurity experiences.

The following research questions (RQ) guided the podcast ethnography:

RQ1: In what ways do a) societal norms (public opinion) and b) social isolation shape international students' food insecurity experiences?

RQ2: What is the willingness of international students to speak out about food insecurity? And what solutions do they recommend to reduce food insecurity challenges?

Methods

Our study used multi-modal data collection via a quantitative survey, followed by the development of a podcast series with a sub-sample of survey participants, and application of podcast ethnography methods to gain rich insights into international students' lived experiences. The University of Florida's Institutional Review Board approved the human subjects research (IRB202201388).

Survey

The survey included modified items from the U.S. Food Security Survey Module as piloted in similar explorations of college students' food insecurity (McArthur et al., 2018; Nikolaus et al., 2019). We recruited participants via email through the University of Florida's Graduate School, International Center, and Multicultural Center. In total, 54 respondents completed the survey. Survey demographic results showed that 71% of respondents ($n = 49$) had an annual household income level less than \$25,000, 63% of respondents identified as a woman, and 59% of the respondents pursued a Ph.D. while 33% pursued a master's degree.

We used IBM SPSS statistical software to analyze responses to 26 questions about participants' experiences with higher education costs and food insecurity. To address RO1 and RO2, we calculated descriptive statistics (e.g., percentage of respondents who received financial support from their host institution, percentage that live on versus off campus, etc.). We also created and analyzed an index variable summarizing food consumption behavior in the last 30 days. To address RO3, we calculated a food insecurity index variable from the respondents' overall food insecurity experiences. We used a Kruskal-Wallis test (Kruskal & Wallis, 1952) to analyze the relationship between the insecurity index and whether the respondent received financial support and the insecurity index with whether the respondent's funding was sufficient to cover living expenses. A Spearman's rho (Zar, 2005) was also used to estimate the relationship between the insecurity index and annual household income.

Podcast Ethnography

After the survey data collection, the lead researcher conducted interviews with seven survey participants as part of her non-thesis master's project and created a podcast series in spring 2023 titled *Food Outcast* (Akers, n.d.). The interview protocol was developed and submitted to the ethics board at the same time as the survey instrument. The protocol consisted of questions to mirror the survey including sub-sections about backgrounds, U.S. transition, financial support, food insecurity definitions, food purchasing behaviors, cultural food options and needs, community resources, mental health and stress, and recommended solutions. The interviews were semi-structured and lasted between 20-45 minutes long in-person and via Zoom. All interview and survey participants voluntarily consented to participate. Survey respondents who were interested in participating in interviews provided their email addresses in the survey

form. The lead researcher then emailed all potential interviewees, and seven responded to schedule interviews (Table 1).

Table 1

Food Outcast Podcast Interview Participants

Pseudonyms	Degree Program	Home Country
Ann	Doctoral	Canada
Jay	Doctoral	Saudi Arabia
John	Master's	Haiti
Juan	Doctoral	Colombia
Nick	Master's	Saudi Arabia
Noah	Doctoral	Nigeria
Sarah	Master's	Canada

A podcast ethnography design guided the qualitative portion of the study (Lundström & Lundström, 2020). Podcast ethnography includes the steps of explore, engage, and examine for analysis. For the explore stage, *Food Outcast* was selected and considered the field site of the ethnography as it was developed to intentionally un-silence international students' food insecurity experiences (Figure 1).

Figure 1

Screenshot of the *Food Outcast* podcast playlist



The lead author and podcast creator described on the project's website:

The hope is that by sharing these personal stories, higher education, national and state government, and communities will foster continued conversations and movements to combat the spiral of silence and ultimately prompt policy change to improve the quality of life of international students (Akers, n.d.).

At the time the podcasts were produced, 3,968 international graduate students were enrolled in the University of Florida (University of Florida International Center, n.d.). Of those students, 3,767 held an F-Visa, 106 a J-Visa, and 95 another visa type. As for funding, 1,660 of the enrolled graduate students reported their primary funding was personal/from family, 1,993

reported their U.S. College/University, and 132 identified a foreign government/university as their primary funder. In 2022, graduate students at several U.S. universities protested for increased wages (Sainato, 2022), and University of Florida Graduate Assistants United also advocated for pay increases during contract negotiations. The graduate students received a raise in 2023 that guaranteed .50 full time employment twelve-month appointment graduate students a stipend of \$25,600 from the previous \$17,000 (Rodriguez, 2025). However, when the union asked for another \$4,000 increase in 2025 to account for academic task duties, they reached an impasse in negotiations with university leadership (Rodriguez, 2025).

The podcasts were posted in 2023 and have had approximately 306 downloads across episodes. *Food Outcast* is hosted on *The Streaming Science Project* (n.d.), a college student-driven science communication platform founded by the fifth author at the University of Florida in the Department of Agricultural Education and Communication. While Lundström and Lundström (2020) conceptualized podcast ethnography as analyzing podcasts produced externally, we adapted the approach to examine researcher-produced podcasts as the field site to intentionally amplify international students' voices and break the spiral of silence.

To engage with the podcast series, the first and fifth author listened to all the episodes multiple times throughout the production process. The interviews were transcribed via the dictate function in Microsoft Word. The fifth researcher verified the transcripts, and the third, fourth, and fifth authors deductively coded (Fife & Gossner, 2024) the transcripts for codes such as *budgeting*, *food consumption*, and *transportation*. Since the podcast was researcher-produced, we did not examine *Food Outcast* for the why, what, and how as Lundström and Lundström (2020) suggested. Instead, we coded each episode's interview dialogue with the Spiral of Science Theory (Noelle-Neumann, 1991) in mind as we deductively coded (Fife & Gossner, 2024) to intentionally share participants' lived experiences, voices, and specific codes connected to the theoretical framework that included *majority opinion*, *social isolation*, and *willingness to speak*.

Each coder listened to the podcasts in their individual apartments, comfortable settings, in their free time outside of class and assistantship hours and made notes of timecodes of quotes related to deductive codes. They each coded transcripts on their home laptops to manually highlight direct quotes connected to deductive codes. Then, the research team collaborated asynchronously via Microsoft Teams to analyze patterns across codes, collate codes to categories, analyze category patterns, and collapse categories to theoretical constructs (Braun & Clarke, 2021; Nowell et al., 2017).

Limitations

The limitations of the study included the survey sample size of only 54 respondents and only one institution was surveyed. The survey results are not generalizable to all U.S. land grant institutions nor all international students' food insecurity experiences. Additionally, the podcast interview sample size could also be considered small. However, saturation of responses was achieved as participants did have overlapping experiences and thoughts about food insecurity

challenges and solutions. The qualitative responses are also not generalizable. However, the survey and podcast results may provide insight into international students' experiences and suggestions that may be helpful in future food resource development or similar research at U.S. land grants.

Validity, Trustworthiness, and Researcher Positionality

To ensure validity, we established survey content validity by adapting items from the widely validated USDA Food Security Survey Module (McArthur et al., 2018). Face validity was confirmed by pilot testing the survey with a small group of international graduate students who provided feedback on item wording. Additionally, reliability was assessed using the consistency measure of Cronbach's alpha for the food insecurity index (Creswell & Creswell, 2017).

To establish trustworthiness of qualitative methods, the first author used participant debriefing procedures with interviewees to establish credibility and authenticity (Creswell & Creswell, 2017; Schwandt et al., 2007). They informed participants of the podcast purpose, research study questions, methods, and double-checked interpretations of interviewees' responses to questions. Dependability and confirmability were addressed through an audit trail of documenting data collection through audio recordings, coded transcripts, and interview summaries to minimize researcher biases and ensure transparency (Creswell & Creswell, 2017; Lincoln & Guba, 1985.)

It is also important to disclose researchers' worldviews and roles to provide transparency and foster trust, as their positions may have influenced interpretation and results (Holmes, 2020). Our research team consisted of four graduate students and one faculty member at the land grant university where the study took place. A post-positivist interpretivist view guided our research as we aimed to investigate international students' multiple perspectives and experiences of the phenomenon of food insecurity. Our research team believed there is no one view of reality and that multiple methods can be applied to interpret human experiences.

The first, third, and fourth researchers were international graduate students at the time of the study and participated in different aspects of podcast production, interviews, data collection, and analysis. While qualitative research is sometimes criticized for having an 'insider' perspective when researchers are involved in multiple study steps, this up-close perspective can also provide richer insights into cultural nuances that are often difficult to access by 'outsiders' (Merton, 1972). An insider position can allow for participants to be more trusting of the researcher to provide more authentic and honest answers (Merton, 1972; Sanghera & Thapar-Björkert, 2008). To mitigate influence of potential insider researcher biases, the second author, a U.S. born domestic student, and fifth author, a U.S. born domestic faculty member, also participated in study design and data analysis procedures. The second author analyzed the survey data independently and verified results with the author team. The third, fourth, and fifth authors independently coded transcripts and engaged in peer debriefing to critically examine emergent

categories and themes as well as researcher positionality (Lincoln & Guba, 1985). Also, the first author co-constructed the podcasts with participants, and they confirmed participants' agreement with the final podcast drafts via member-checking to establish validity (Creswell & Creswell, 2017; Motulsky, 2021).

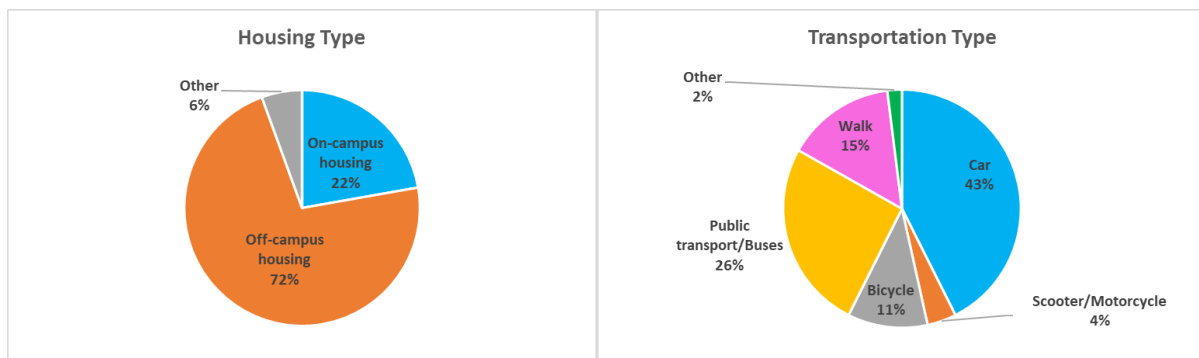
Results

Survey

Survey results illuminated the financial insecurity struggles international graduate students experienced at a land grant university. RO1 addressed the living status, income, type of housing, and mode of transportation. Sixty-seven percent of respondents ($n = 54$) reported receiving support from their host institution. Thirty-five percent thought the funding was sufficient to cover living expenses ($n = 37$). Of the students who thought their financial support was sufficient, their mean monthly income was \$1,879 ($n = 12$). Of the students who did not think their financial support was sufficient, their mean monthly income was \$1,420 ($n = 17$). Of the students who were unsure if their support was sufficient, their mean monthly income was \$1,554 ($n = 7$). Seventy-two percent of participants reported living off campus, and 43% owned a car while 41% walked or used public transportation (Figure 2).

Figure 2

International students' housing and transportation types.



RO2 addressed budget impacts on international graduate students' recent food consumption behaviors. The quantitative measure was an index variable summarizing food consumption questions that had a Cronbach's alpha of 0.771. This suggests that the items in the index consistently measured the same underlying concept, as values above 0.70 are generally considered acceptable for reliability (Tavakol & Dennick, 2011). At least 65% of respondents answered predominantly "no" to consumption index questions, indicating that they did not engage in negative food consumption behavior ($n = 52$; Table 2). Due to the lack of variability for the consumption index, no other analyses were conducted.

Table 2*Food consumption index items.*

In the last 30 days, did you ever...	Frequency of <i>No Responses</i>	Percent of <i>No Responses</i>
Cut the size of your meals or skip meals because there wasn't enough money for food?	34	65%
Eat less than you felt you should because there wasn't enough money for food?	34	65%
Were you ever hungry but didn't eat because there wasn't enough money for food?	42	81%
Did you lose weight because there wasn't enough money for food?	40	77%
Did you ever not eat for a whole day because there wasn't enough money for food?	49	94%

RO3 examined international graduate students' overall food insecurity experiences. An analysis of an index variable summarizing food insecurity questions showed Cronbach's alpha of 0.700, indicating reliability which means the index consistently measured the base concept of food consumption. A low insecurity index variable score is associated with higher food insecurity. A Kruskal-Wallis means comparison performed with the insecurity index versus whether the student received financial support revealed no significant difference. The Kruskal-Wallis means comparison performed with the insecurity index versus if financial support was sufficient to cover living expenses revealed a borderline significant difference between *Yes* and *No* responses, with students who did not feel that their financial support was sufficient experienced more food insecurity ($n = 37$). Descriptive results of the food insecurity index items for students who did not feel they received enough financial support suggested they worried about food running out and being able to eat balanced meals (Table 3).

Table 3*Food insecurity index items*

	N	Mean	SD
How easy is it for you to get to a location where you can get food?*	17	3.44	1.62
I have worried whether my food would run out before I got money to buy more.	17	2.06	0.97
The food that I buy just doesn't last, and I don't have enough money to get more.	17	2.75	1.10
I can't afford to eat balanced meals.	17	1.94	0.94
I have used a community resource like a food pantry.*	17	2.88	1.48

Note. The scale ranges from 1 (high food insecurity) to 5 (low food insecurity). *Recoded values reported.

A significant Spearman's Rho correlation coefficient of 0.493 was found between the insecurity index and eight annual household income categories, meaning that as household income increased, food insecurity decreased.

Podcast Ethnography

The examination of food insecurity experiences included a podcast series of seven international students from the University of Florida, who discussed their experiences and suggested solutions to the issue. Three of the students were working on their master's degree and four on their Ph.D. They spanned the globe, from Saudi Arabia, Canada, Haiti, Nigeria, to Colombia. Four of the students received funding from the University of Florida, and three received scholarships from their home country. They each had spent from two to twelve years as an international student.

The first author served as the podcast host and producer. At the time, she was an international master's degree student from Ireland attending the same university as the interviewees. Throughout the interviews, she shared her personal stress managing a limited stipend, tuition, and insurance costs and sacrificing social engagement to avoid debt. Like interviewees, she avoided eating out, struggled to find culturally appropriate foods, concealed hardships from family and friends, and expressed frustrations with systemic marginalization. She felt discomfort speaking out about her food insecurity experiences, but she emphasized the importance of developing safe channels to unsilence international students to call for structural change.

Theme 1 (RQ1): International graduate students expressed feelings of marginalization amid institutional norms and concealed their food insecurity struggles.

The Spiral of Silence Theory deductive code *majority opinion* appeared predominantly throughout data analysis as participants described experiences of systemic norms that disadvantaged international students and how they often quietly adapted. For instance, they described experiences of adjusting to visa restrictions, lack of cultural food options, and normative acceptance of the affordability of processed food over nutritious food.

Most of the participants who received stipends from their universities had visa restrictions limiting them to 20 hours a week of work for their host institution. Ann, a Ph.D. student from Canada, described watching budgets closely with two spreadsheets each month to live within her means. Sarah, another Ph.D. student from Canada, also discussed how she closely monitored her spending on groceries. She said, "I try to spend less than 50 dollars a week, which is really pushing it with sometimes, especially when you're trying to buy meat or laundry detergent." Nick, a master's student from Saudi Arabia, discussed that a company he worked for in his home country paid for his tuition and a stipend that was 30% of what his salary was back home, noting challenges in providing the same quality of life for his daughter and wife in the U.S. He said, "Sometimes, I don't eat my breakfast or my lunch. To save some money for them."

Participants appeared to adjust their diets to fit structural constraints. Some described how they sometimes could not afford balanced meals, how they experienced what were called “Ramen Noodle days” (inexpensive dry foods), and how they did not have access or availability to cultural foods. Juan, a Ph.D. student from Colombia, received tuition coverage and a stipend from his institution. He described stretching his budget each month to pay for groceries as nutritious food often came at a higher price than lower quality processed items. He said:

I eat well, and I’m not saying that I’m going to get a really expensive steak, but I’m going to go for my veggies and for my fruits for a better source of protein...But sometimes, it’s just relying on more processed food...Or sometimes, just wait for the food pantry here.

The participants from Muslim backgrounds described the challenge of finding foods served Halal (prepared in a specific way according to Islamic guidelines) and that these foods were overpriced in the U.S. Jay, a Ph.D. student from Saudi Arabia said, “Places that help [Muslim] students to find their food, doesn’t exist. You have to find someone who is from the same religion, so they have a store they can provide.” Jay said he found a family-owned international store, after looking for some time, where he could purchase Halal foods.

Participants said another challenge was determining when and how to cut costs for “extras” such as better housing, technology, learning materials, or recreational activities due to lack of monetary funds. Noah described, “At times, I’d really, really love to go to a nice restaurant...but I need to look at my wallet and see, ‘What do you have in there? You can actually afford that, okay.’” The students also described that basic needs such as medical expenses for an unexpected illness could drastically shift their budgets and food consumption to compensate for the additional bills due to limited insurance coverage.

Transportation was a common challenge as most participants could not afford car ownership, asked others for rides, or spent considerable time using public transport. Nick said, “Currently, if I’m going to the grocery stores, I reach out to a friend to pick me up.” He described that he did not want to become a disturbance and that he found it challenging to be respectful of their time while seeking support for his own needs. Jay said the bus could be unreliable, noting, “I used to wait like almost two hours because the buses in the fall used to be really, really busy, and I had to wait until the bus passed me.”

Within their experiences of systematic exclusion, international students’ *social isolation* manifested in forms of reduced communal dining. For instance, Jay limited his social outings and mostly ate at home. Similarly, Juan discussed staying home as a strategy to avoid spending money which also kept him socially isolated. John described avoiding crowded food pantries so people he knew would not see him there, and he also used different strategies to socializing such as going with a classmate for coffee yet not purchasing a drink to save money.

Several participants also described hiding their food insecurity hardships due to shame, pride, or fear of burdening others. Ann explained how she did not want to trouble her parents by asking for monetary support. She said, “I never want to let on that I’m having a hard time or ask

them for anything, because I know that they would just give and give, and I don't want that." Juan discussed how financial stress impacted his anxiety and focus on his classes, saying, "It's a lot of pressure on you, and a pressure that no one like put you in...Just you pursuing your dreams or your passion." He said he spent time in meditation and therapy to cope with his anxiety and stress. Nick, Noah, and Sarah all discussed missing family, financial and academic pressures, yet setting boundaries to find balance and trying to find personal time for relaxation and optimism.

Theme 2 (RQ2): While international graduate students were often hesitant to speak out, they recognized a need for collective advocacy for institutional change centered on financial assistance and food access.

Though participants developed methods to adapt and cope with food insecurity and hesitated to speak out, several expressed a need to raise public and policymakers' awareness. For instance, John said:

The people who decide our situation on a visa status...They think we are good. They think we are comfortable because we don't express ourselves about that...I think it's really important to express ourselves to say, 'Hey, we are struggling. We can't breathe.'

Noah was initially reluctant to open-up to other about his experiences, but he advised fellow international students to "Try as much as possible to open-up...If we don't talk about it, nobody's going to talk about it." Sarah and Juan stressed the importance of participating in food insecurity conversations, with Juan saying, "I will encourage [my peers] to just get out of that comfort zone...do it because it matters."

Providing more money in stipends or more opportunities to make money through lifting visa restrictions were common solutions to the challenges food insecurity international students faced. Participants felt limited by visa stipulations that restricted their ability to work outside of their assistantships or institution. John said, "It's very frustrating when you have the work ethic but can't legally improve your situation." Juan had similar sentiments and said, "I think the answer is to just let everyone work...if we could work on the side, especially since there are so many opportunities." Sarah also believed increasing stipends and lifting visa restrictions to allow for more work hours would improve the situation, noting that temporary visa holders would not be "stealing" jobs that need to be filled.

Participants also suggested opportunities for institutions and departments to provide support for international students. Ann suggested, "I think that each department should have an international representative that is specific to that department or college." Others recommended enhanced opportunities for international students to build community, share resources and provide advice. Jay emphasized the importance of, "giving [international students] a chance to interact with each other to help them share their knowledge." Creating groups on campus or online to build community were common suggestions.

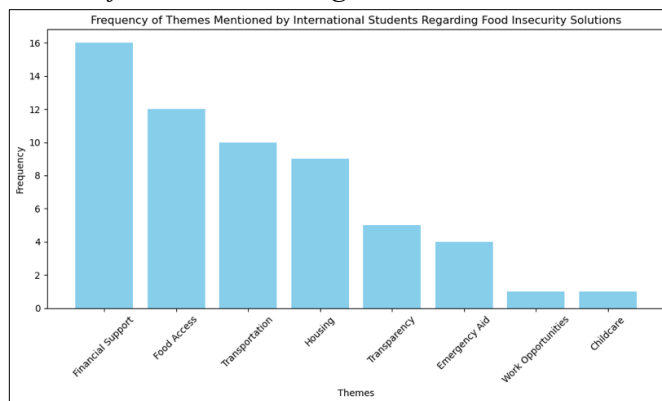
Directly related to food insecurity, podcast participants also provided solutions to increase access to and affordability of diverse food options. With a common challenge of

transportation, some participants recommended a university sanctioned transportation service to move students from campus to grocery stores or to provide more basic food items for purchase on campus. Others suggested the university provide more coupons for grocery stores or subsidized meal plans for international and low-income students. Some podcast participants suggested increasing access to cultural foods.

In the survey, participants were also asked the open-ended qualitative question of *What do you think are some food insecurity solutions that universities could provide to better aid international students?* Forty-eight participants provided responses that were inductively coded into categories (Figure 3).

Figure 3

Themes for international graduate students' recommended food insecurity solutions



Financial support included solutions such as "Raise the stipend to properly compensate the current inflation or create an additional special stipend exclusive for food." Food access responses substantially focused on increasing the number of food pantries, quantity of food in pantries, and solutions such as "Subsidized meal plans...At the least, subsidized rice, bread, eggs, and milk." Transportation solutions included increasing bus routes and frequency, and ride share services for booking cars to grocery stores. Mentions of work opportunities focused on allowing F-1 students to work off campus, seek part-time employment, and paid internships.

Emergency aid solutions centered around providing credit such as loans without interest for international students to pay back after graduation or for health emergencies. Housing recommendations focused on providing more affordable options. One respondent wrote, "Graduate housing is expensive. Sometimes you have to choose between housing and food." The transparency theme emerged in connection to universities clearly communicating expected salaries, deductions for costs such as taxes and fees, expected attendance costs, and food expenses for prospective international students to plan their finances accordingly. Finally, some respondents with dependents described the need for childcare support, "Since my husband can't work because of his F-2 visa, the three of us live on my income, which is not enough."

Discussion and Conclusions

Our study revealed significant insights into the food insecurity experiences of international graduate students at a U.S. land grant university. The quantitative survey results highlighted participants' financial struggles, with a majority reporting annual household incomes below \$25,000. Financial instability was directly related to higher levels of food insecurity, as evidenced by the significant Spearman's Rho correlation coefficient between household income and food insecurity index. These findings suggest that international students in higher education systems globally may face structurally similar constraints related to funding models, visa policies, and access to culturally appropriate food, particularly within land-grant or publicly funded institutions.

The podcast ethnography results provided a deeper understanding of international students' lived experiences. Participants described challenges such as insufficient stipends, lack of access to cultural foods, transportation issues, and emotional stress. These findings align with previous research indicating that international students are particularly vulnerable to food insecurity due to financial constraints and limited employment opportunities (McArthur et al., 2018; Nikolaus et al., 2019) and that insufficient food access can lead to mental and physical health challenges (Roberts et al, 1999). These findings are particularly relevant for international agricultural and extension education programs, where students often serve as future practitioners, educators, and change agents in their home countries. Food insecurity and financial instability may not only affect student well-being but also influence academic persistence, professional preparation, and long-term capacity to contribute to global agricultural systems.

Connecting the findings to the Spiral of Silence theory, we observed that international students may feel compelled to remain silent about their food insecurity experiences due to perceived social norms and fear of being marginalized. The Spiral of Silence theory posits that individuals are less likely to express minority opinions, especially when they perceive a dominant majority opinion (Noelle-Neumann, 1991). In the context of our study, international students may have perceived food insecurity as a taboo topic, leading to a reluctance to seek help or discuss their struggles openly. The silence perpetuated the issue, as the lack of visibility and discussion prevented the implementation of effective solutions. However, several participants noted the need to collectively raise awareness of food insecurity experiences for positive systematic change. This study contributes the methodological approach of podcast ethnography as a scalable and adaptable to elicit and amplify marginalized voices in international education contexts. Creating structured, culturally responsive communication spaces may help reduce barriers associated with the Spiral of Silence, enabling international students across institutions to share experiences that are otherwise hidden.

Recommendations

Based on our findings, we propose several recommendations to address food insecurity among international graduate students. We recommend U.S. land grant universities consider increasing monthly stipends, emergency funds, financial aid, and scholarships for international

students. Additionally, there is a need for thoughtful consideration of visa policies that could provide international students with more flexible work opportunities beyond their academic institutions or programs. Such changes may help alleviate financial stress and support their overall well-being. Universities should also consider developing community groups for international students to share knowledge and support as well as promote discussion through workshops, seminars, and student forums about food insecurity. Universities should also consider increasing access to cultural foods, such as Halal options, and implement transportation services to grocery stores.

Our recommendations for future research include replicating and expanding the quantitative survey to a larger and more diverse sample of international students across multiple institutions for generalizable findings and a more comprehensive understanding of food insecurity experiences and solutions. There is also an opportunity to conduct longitudinal research to identify trends and long-term impacts of interventions designed to alleviate food insecurity. Scaling up the qualitative methods to conduct interviews across institutions and add more episodes to the *Food Outcast* podcast series would provide richer insights and a more holistic view of students' experiences and recommended solutions. Finally, policy studies could investigate the impact of visa restrictions and employment policies on financial stability and inform advocacy efforts for change at institutional and government levels.

References

- Akers, A. (Host). (n.d.). *Food Outcast* [Audio podcast]. The Streaming Science Project. <https://streamingscience.com/food-outcast/>
- Baba, Y., & Hosoda, M. (2014). Home away home: Better understanding of the role of social support in predicting cross-cultural adjustment among international students. *College Student Journal*, 48(1), 1–15. <https://eric.ed.gov/?id=EJ1034182>
- Braun, V. & Clarke, V. (2021). One size fits all? What counts as quality practice in (reflexive) thematic analysis? *Qualitative Research in Psychology*, 18(3), 328 – 352. DOI: 10.1080/14780887.2020.1769238
- Brown, L. (2016). The role of food in the adjustment journey of international students. In *The new cultures of food* (pp. 37-56). Routledge.
- Bottorff, J. L., Hamilton, C., Huiskens, A., & Taylor, D. (2020). Correlates of food insecurity among undergraduate students. *Canadian Journal of Higher Education*, 50(2), 15–23. <https://doi.org/10.47678/cjhe.v50i2.188699>
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

- dos Santos Bicudo, D. (2024). *Misrecognition and misrepresentation: A critical analysis of the trajectory of migrant students – F1 students, in the U.S.* (Master's capstone project, CUNY Graduate Center). CUNY Academic Works.
- De Haen, H., Klasen, S., & Qaim, M. (2011). What do we really know? Metrics for food insecurity and undernutrition. *Food Policy*, 36(6), 760–769.
<https://doi.org/10.1016/j.foodpol.2011.08.003>
- Eland, A., & Thomas, K. (2013). Succeeding abroad: International students in the United States. In H. C. Alberts & H. D. Hazen (Eds.), *International students and scholars in the United States: Coming from abroad* (pp. 145–162). Palgrave Macmillan.
- El Zein, A., Mathews, A. E., House, L., & Shelnutt, K. P. (2018). Why are hungry college students not seeking help? Predictors of and barriers to using an on-campus food pantry. *Nutrients*, 10(9), 1163. <https://doi.org/10.3390/nu10091163>
- Fife, S. T., & Gossner, J. D. (2024). Deductive qualitative analysis: Evaluating, expanding, and refining theory. *International Journal of Qualitative Methods*, 23.
<https://doi.org/10.1177/16094069241244856>
- Gao, X., Scott, T., Falcon, L. M., Wilde, P. E., & Tucker, K. L. (2009). Food insecurity and cognitive function in Puerto Rican adults. *The American Journal of Clinical Nutrition*, 89(4), 1197–1203. <https://doi.org/10.3945/ajcn.2008.26941>
- Ho, S.S., Brossard, D., & Scheufele, D.A. (2008). Effects of value predispositions, mass media use, and knowledge on public attitudes toward embryonic stem cell research. *International Journal of Public Opinion Research*, 20(2), 171 – 192.
<https://doi.org/10.1093/ijpor/edn017>
- Holmes, A. G. D. (2020). Researcher positionality – A consideration of its influence and place in qualitative research – A new researcher guide. *Shanlax International Journal of Education*, 8(4), 1–10. <https://doi.org/10.34293/education.v8i4.3232>
- Kruskal, W. H., & Wallis, W. A. (1952). Use of ranks in one-criterion variance analysis. *Journal of the American Statistical Association*, 47, 583–621. <https://doi.org/10.2307/2280779>
- Lee, W., Detenber, B. H., Willnat, L., Aday, S., & Graf, J. (2004). A cross-cultural test of the spiral of silence theory in Singapore and the United States. *Asian Journal of Communication*, 14(2), 205–226.
- Li, R. Y., & Kaye, M. (1998). Understanding overseas students' concerns and problems. *Journal of Higher Education Policy and Management*, 20(1), 41–50.
<https://doi.org/10.1080/1360080980200105>
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. SAGE Publications.

- Loofbourrow, B. M., & Scheer, R. (2023). Food insecurity in higher education: A contemporary review of impacts and explorations of solutions. *International Journal of Environmental Research and Public Health*, 20(10), 5884. <https://doi.org/10.3390/ijerph20105884>
- Lundström, M., & Lundström, T. P. (2020). Podcast ethnography. *International Journal of Social Research Methodology: Theory and Practice*, 24(3), 289–299. <https://doi.org/10.1080/13645579.2020.1778221>
- McArthur, L. H., Ball, L., Danek, A. C., & Holbert, D. (2018). A high prevalence of food insecurity among university students in Appalachia reflects a need for educational interventions and policy advocacy. *Journal of Nutrition Education and Behavior*, 50(6), 564–572. <https://doi.org/10.1016/j.jneb.2017.10.011>
- Merton, R. K. (1972). Insiders and outsiders: A chapter in the sociology of knowledge. *American Journal of Sociology*, 78(1), 9–47.
- Motulsky, S. L. (2021). Is member checking the gold standard of quality in qualitative research? *Qualitative Psychology*, 8(3), 389–400. <https://doi.org/10.1037/qup0000205>
- NAFSA: Association of International Educators. (2021, November 15). New NAFSA data show largest ever drop in international student economic contributions to the U.S. <https://www.nafsa.org/about/about-nafsa/new-nafsa-data-show-largest-ever-drop-international-student-economic>
- NAFSA: Association of International Educators. (2025, Fall). *International students contributed \$43 billion to the U.S. economy in 2024–2025*. <https://www.nafsa.org/about/about-nafsa/international-students-contributed-43-billion-us-economy-2024-2025-fall-2025>
- Nikolaus, C. J., Ellison, B., & Nickols-Richardson, S. M. (2019). College students' interpretations of food security questions: Results from cognitive interviews. *BMC Public Health*, 19(1282). <https://doi.org/10.1186/s12889-019-7629-9>
- Noelle-Neumann, E. (1991). The theory of public opinion: The concept of the spiral of silence. *Annals of the International Communication Association*, 14(1), 256–287. <https://doi.org/10.1080/23808985.1991.11678790>
- Noelle-Neumann, E. (1993). *The spiral of silence: Public opinion—Our social skin*. University of Chicago Press.
- Nowell, L.S., Norris, J.M., White, D.E. & Moules, N.J. (2017). Thematic analysis: striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, 16(1), 1 – 13. <https://doi.org/10.1177/160406917733847>

- Özturgut, O., & Murphy, C. (2010). Literature vs. practice: Challenges for international students in the U.S. *International Journal of Teaching and Learning in Higher Education*, 22(3), 374–385. <http://www.isetl.org/ijtlhe/>
- Pilli, B., & Slater, J. (2021). Food experiences and dietary patterns of international students at a Canadian university. *Canadian Journal of Dietetic Practice and Research*, 82(3), 100–106.
- Poyrazli, S., & Grahame, K. M. (2007). Barriers to adjustment: Needs of international students within a semi-urban campus community. *Journal of Instructional Psychology*, 34(1), 28. <https://eric.ed.gov/?id=EJ761254>
- Roberts, R., Golding, J., Towell, T., & Weinreb, I. (1999). The effects of economic circumstances on British students' mental and physical health. *Journal of American College Health*, 48(3), 103–109. <https://doi.org/10.1080/07448489909595681>
- Rodriguez, A. (2025, November 18). The latest hearing in 2-year battle over UF graduate assistant wages. *The Independent Florida Alligator*. <https://www.alligator.org/article/2025/11/special-magistrate-steps-in-for-uf-gau-negotiations>
- Sainato, M. (2022, March 30). US graduate students protest against low pay while universities profit from their work. *The Guardian*. <https://www.theguardian.com/us-news/2022/mar/30/us-graduate-students-protest-against-low-pay-while-universities-profit-from-their-work>
- Sanghera, G. S., & Thapar-Björkert, S. (2008). Methodological dilemmas: Gatekeepers and positionality in Bradford. *Ethnic and Racial Studies*, 31(3), 543–562. <https://doi.org/10.1080/01419870701491952>
- Schwandt, T. A., Lincoln, Y. S., & Guba, E. G. (2007). Judging interpretations: But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New directions for evaluation*, 2007(114).
- Shi, Y., Lukomskyj, N., & Allman-Farinelli, M. (2021). Food access, dietary acculturation, and food insecurity among international tertiary education students: A scoping review. *Nutrition*, 85, 111100. <https://doi.org/10.1016/j.nut.2020.111100>
- Sloven, N., Fitzmaurice, G., Williams, D. R., & Gilman, S. E. (2010). Poverty, food insecurity, and the behavior for childhood internalizing and externalizing disorders. *Journal of the American Academy of Child & Adolescent Psychiatry*, 49(5), 444–452. <https://doi.org/10.1097/00004583-201005000-00005>
- Soldavini, J., Andrew, H., & Berner, M. (2022). Campus-based food insecurity: The case of international students at a southeastern university. *Journal of Student Affairs Research and Practice*, 59(3), 338–351. <https://eric.ed.gov/?id=EJ1353458>

Streaming Science Project. (n.d.). *Streaming Science brings the science directly to you*. University of Florida. <https://streamingscience.com/>

Taborda, E. K. (2020). *Socio-economic well-being of international F-1 students living and working in the United States* (Publication No. 27834732) [Doctoral dissertation, University of Massachusetts Boston]. ProQuest Dissertations and Theses Global.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53–55. <https://doi.org/10.5116/ijme.4dfb.8dfd>

Thomas, K., & Althen, G. (1989). Counseling foreign students. In P. B. Pedersen, J. G. Draguns, W. J. Lonner, & J. E. Trimble (Eds.), *Counseling across cultures* (3rd ed., pp. 205–241). University of Hawaii Press. <https://psycnet.apa.org/record/1989-97749-000>

Trice, A. G. (2003). Faculty perceptions of graduate international students: The benefits and challenges. *Journal of Studies in International Education*, 7(4), 379–403. <https://doi.org/10.1177/1028315303257120>

University of Florida International Center. (n.d.). *International students dashboard*. <https://internationalcenter.ufl.edu>

U.S. Immigration and Customs Enforcement. (n.d.). *SEVIS: Employment*. U.S. Department of Homeland Security. <https://www.ice.gov/sevis/employment>

U.S. Immigration and Customs Enforcement. (2024). SEVIS by the numbers: Annual report on foreign student trends. *Department of Homeland Security*. https://www.ice.gov/doclib/sevis/btn/25_0605_2024-sevis-btn.pdf

Yingyi, S., Austin, W. T., & Liu, W. (1995). Coping with anomic stress: Chinese students in the USA. *Deviant Behavior*, 16(2), 127–149. <https://psycnet.apa.org/doi/10.1080/01639625.1995.9967993>

Zar, J. H. (2005). Spearman rank correlation. In P. Armitage & T. Colton (Eds.), *Encyclopedia of biostatistics*. <https://doi.org/10.1002/0470011815.b2a15150>