

Understanding Food Insecurity Among Collegiate Athletes: A Qualitative Study at a Public University in New England

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Context: Authors of previous research at a public university in New England, where the current study takes place, showed that approximately one-third of undergraduate students have experienced some aspect of food insecurity. More recent investigators at this university revealed that students who were members of a sport team were 4 times more likely to be food insecure than their peers who were not on a sport team. The estimated prevalence of student-athlete food insecurity from other previous research studies ranged from 14% to 32%.

Objective: To understand the contributing factors to food insecurity among collegiate athletes.

Design: Qualitative study.

Setting: A public university in New England.

Patients or Other Participants: Data are presented for 10 collegiate athletes who experienced some level of food insecurity

according to the United States Department of Agriculture Six-Item Short Form.

Data Collection and Analysis: Data were collected using a brief demographic questionnaire and semistructured interviews.

Results: Contributing factors were a lack of time, special dietary needs, limited campus dining options, and limited access to transportation or kitchens. Coping strategies were managing time and resources, buying cheaper foods, and skipping meals. Food insecurity negatively affected students' athletic performance. The athletes struggled to balance their athletic and academic schedules and obtain a diet that allowed them to meet their performance goals.

Conclusions: Additional and innovative programming is needed to support food-insecure student-athletes.

Key Words: nutrition, diet, academic performance, athletic performance

Key Points

- Contributing factors to student-athlete food insecurity were a lack of time, limited campus dining options, and limited access to transportation and kitchens.
- Food insecurity had negative effects on student-athletes' athletic and academic performances.

In 2019, an estimated 10.5% of households in the United States were food insecure.¹ Many colleges and universities have started to measure food insecurity on their campuses, with authors of representative studies finding that between 14.1% and 52.1% of students were food insecure.^{2–5} Food insecurity among college students is related to decreased academic performance, such as lower grade point averages, having difficulty focusing in class, and an increased likelihood of withdrawing from or failing courses.^{4,6} Food-insecure college students are also more likely to be depressed^{7–9} and participate in unhealthy behaviors such as skipping breakfast⁷ and eating fewer servings of fruits and vegetables.^{7,10}

Previous researchers at a public university in New England, where the current study took place, have shown that approximately one-third of its undergraduate students experienced some aspect of food insecurity.^{8,11} These surveys were a representative survey of students, with a high response rate of 87% for both studies.^{8,11} More recent investigators at this university revealed that students who were members of a sport team were 4 times more likely to be food insecure than their peers who were not on a sport team.⁸

Since this study was conducted, more examinations of food insecurity among student-athletes have been published. The estimated prevalence of student-athlete food insecurity in these individual studies ranged from 12% to 32%.^{12–17} Reasons for student-athlete food insecurity were limited time and finances^{15,17} and less time to work paying jobs.¹⁷ In research done by The Hope Center for College, Community, and Justice, rates of food insecurity were also higher among student-athletes at National Collegiate Athletic Association (NCAA) Division II schools (26%) than at Division I (24%) and Division III (21%) schools.¹⁷ Food insecurity affected athletes' ability to perform in their sports.¹³

Most earlier authors evaluating student-athlete food insecurity collected quantitative data from cross-sectional designs using online surveys administered via email^{14–16} or in person.¹³ Our work is among the first of its kind: we collected qualitative data to provide deeper insights into collegiate student-athlete food insecurity.

The purpose of our study was to understand why these student-athletes experienced a high burden of food insecurity. Specifically, our aims were to answer the following research

questions: (1) Why were student-athletes experiencing food insecurity? (2) How did student-athletes cope with food insecurity? (3) What were the consequences of food insecurity on student-athletes? (4) What programmatic suggestions to address athlete food insecurity did athletes have?

METHODS

Study Design

A key informant interview with one of the strength coaches on campus was completed as preliminary work for this study. The strength coach shared that some athletes experienced decreased performance in the weight room and significant weight loss between semesters. As a result of this interview, the strength coach and researcher (J.A.) formed a partnership to investigate the underlying factors contributing to the observations of the strength coach and the higher rates of food insecurity among student-athletes on campus as reported in Zigmont et al.⁸ The strength coach assisted in advertising the study to the athletes, and the researcher reported the results to the coach at the completion of the work.

We used generic qualitative methods,¹⁸ including semi-structured interviews, to obtain a richer understanding of student-athletes' experiences with food insecurity. Institutional review board approval was obtained at the university before data collection.

Participants

Student-athletes were recruited using convenience and snowball sampling during the spring 2020 semester. Inclusion criteria required participants to be (1) athletes participating in any sport (sport club or NCAA Division sport team) and (2) at least 18 years old.

Flyers were posted across campus to advertise the study. The strength coach also helped distribute flyers and verbally advertised the study to athletes. Participants who completed an interview were encouraged to tell their friends about the study. Interested student-athletes contacted the researcher (J.A.) via email to set up an interview. The researcher set up an interview date and time that fit the student's schedule.

Instrumentation

Before the interviews, each student-athlete completed a brief questionnaire (Appendix A) to supply basic demographic information and food insecurity status using the United States Department of Agriculture (USDA) U.S. Household Food Security Survey Module: Six-Item Short Form.¹⁹ Both the interview guide (Appendix B) and demographic questionnaire were adapted from those used previously by Zigmont et al.²⁰ to ensure that the language of the questions matched the student-athlete population. We adopted this interview guide because it had been used at this university in an earlier study.²⁰ The interview guide was also reviewed by several content experts in advance. A constant comparative approach was used to review and improve the semistructured interview questions throughout.

Procedure

Interviews were held in a private room in the university library. The student-athlete was first given a brief description of the study, and informed consent was obtained. All participants

were informed that the interview would be audio recorded and that they could either use a pseudonym or not provide their name. Student-athletes then completed a short demographic questionnaire. The interviews lasted between 10 and 18 minutes. At the end of the interview, each participant was given a list of food insecurity resources on campus and a \$20 gift card to a local grocery store. Interviews were later deidentified and transcribed for coding and analysis, all of which was stored securely by the primary researcher (J.A.). The recordings were deleted after they were transcribed.

Interviews were conducted until saturation was reached. Saturation in this case reflected an ongoing process of reviewing the data and ending the sampling and interviewing processes when little to no additional data or themes were being identified. After removing ineligible participants, we again confirmed saturation by reviewing the remaining eligible participant interviews and ensuring that no new themes were being identified.

Analysis

Demographic questionnaires were analyzed using Excel (version 2019; Microsoft Corp) to gather frequencies, percentages, means, and SDs (when applicable) of the student-athlete demographic data. Interview recordings were transcribed verbatim into Word (version 2019; Microsoft Corp) with the help of a transcription app, Transcribe - Speech to Text,²¹ and were reviewed and edited as needed for accuracy. An initial review of the interviews identified recurring ideas and experiences to inform the coding and major themes. To minimize researcher bias and ensure that the results accurately reflected the participants' voices, the 2 researchers coded the interview transcripts separately using Microsoft Word and met to compare and consolidate codes. Coded interviews were then analyzed for themes. Themes were further analyzed for patterns. Interview themes, patterns, and quotes are provided here to demonstrate the findings. Final patterns, codes, and themes were organized into the appropriate levels of the socioecological model.²² Triangulation was also used to align interview data with USDA food insecurity status.

RESULTS

A total of 18 student-athletes emailed the researcher expressing interest in this study. Interviews were conducted with all 18. All questionnaires and interviews were reviewed for indications of food insecurity to verify that the student-athletes qualified for the study. Questionnaire and interview data were removed from analysis for 7 participants who were not food insecure according to their responses to the USDA questions. As only 1 participant was a member of a club sports team, we decided to remove this person and focus on NCAA athletes only. We present data for the 10 student-athletes on NCAA teams who were found to be food insecure.

Description of the Sample

A total of 10 NCAA athletes who were food insecure participated. All but 1 of these student-athletes were White (non-Hispanic; $n = 9$, 90%). The study population was evenly divided between males and females. Their average age was 20 ± 1.8 years. A majority lived on campus ($n = 8$, 80%) and in a residence hall ($n = 7$, 70%). Other student-athletes lived in an off-campus house or apartment ($n = 2$, 20%). One

Table 1. Participant Characteristics (n = 10)

Characteristic	No. (%)	Mean \pm SD
Age, y		20 \pm 1.8
Race or ethnicity		
Hispanic	1 (10.0)	
White (non-Hispanic)	9 (90.0)	
Sex		
Female	5 (50.0)	
Male	5 (50.0)	
Do you live on or off campus?		
On campus	8 (80.0)	
Off campus	2 (20.0)	
Where do you live?		
Residence hall	7 (70.0)	
House, apartment, etc	2 (20.0)	
On-campus apartment	1 (10.0)	
Academic classification		
Freshman	2 (20.0)	
Sophomore	3 (30.0)	
Junior	5 (50.0)	
Hours worked per week		
0	7 (70.0)	
1–12	2 (20.0)	
12+	1 (10.0)	
How are you financing your education?		
My own money	1 (10.0)	
Scholarships and grants	7 (70.0)	
Student loans	5 (50.0)	
Assistance from family and friends	5 (1.0)	
Are you on a meal plan?		
No	1 (10.0)	
Yes, unlimited	4 (40.0)	
Yes, declining balance	5 (50.0)	
Food security status		
Marginal	3 (30.0)	
Low	2 (20.0)	
Very low	5 (50.0)	

individual lived in an on-campus apartment. One-third (n = 3, 30%) of the student-athletes reported having no or limited access to a kitchen (eg, the kitchen was on a different floor than their dormitory room, which made it hard to access). All participants were attending the university full time (Table 1).

Using the scoring guide for the USDA Household Food Insecurity: Six-Item Short Form, we found that half of the sample experienced very low food security (n = 5, 50%), followed by marginal food security (n = 3, 30%) and low food security (n = 2, 20%). We summarized the participant responses to the USDA Household Food Insecurity questions¹⁹ in Table 2.

Interviews

Interviews with the student-athletes revealed reasons why they experienced food insecurity, provided insight into the methods they used to cope with their food insecurity, and described some of the consequences food insecurity had on their academic and athletic lives. Themes that emerged regarding reasons for food insecurity were a lack of time, special dietary needs, limited kitchen access, and having a limited meal plan available. The participants coped with food insecurity by using organizational and planning skills, purchasing generic brands when grocery shopping, and rationing food when resources were scarce. Among the consequences of food insecurity were negative athletic performance, academic

Table 2. Student Responses to Food Insecurity Questions (n = 10)

Question	No. (%)
The food that I bought just didn't last, and I didn't have money to get more. Was that often, sometimes, or never true for you in the last 12 months?	
Often	4 (40.0)
Sometimes	6 (60.0)
Never	0 (0.0)
I couldn't afford to eat balanced meals. Was that often, sometimes, or never true for you in the last 12 months?	
Often	2 (20.0)
Sometimes	4 (40.0)
Never	4 (40.0)
In the last 12 months, did you ever cut the size of your meals or skip meals because there wasn't enough money for food?	
Yes	5 (50.0)
No	5 (50.0)
If you responded yes above, how often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?	
Almost every month	2 (40.0)
Some months but not every month	2 (40.0)
Only in 1 or 2 mo	1 (20.0)
In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?	
Yes	6 (60.0)
No	4 (40.0)
In the last 12 months, were you ever hungry but didn't eat because there wasn't enough money for food?	
Yes	3 (30.0)
No	7 (70.0)

difficulties, and increases in stress levels. Participants had several ideas for steps the university could take to help student-athletes who were food insecure: increasing the number of meal swipes allotted to them, improving the food options at the university dining hall, and placing healthy food options inside athletic buildings.

Why Were Student-Athletes Food Insecure?

Lack of Time. Most athletes described having a lack of time for grocery shopping, cooking, and eating due to busy academic and athletic schedules. Even though most individuals had a meal plan, a lack of time between classes and practices made stopping at the dining hall for a meal challenging. This lack of time also caused some athletes to skip meals altogether.

Similarly, between classes, practices, work, and games, athletes often did not return to their dormitories or homes until late. By this time, they did not have the energy to cook a meal and preferred to just “grab something quick” to eat, saying,

... just running between classes, sometimes I have to skip a meal or 2 so I can run to work and then maybe just have a bigger meal later. . .

and

... especially if I have a late-night practice, if I come home, like I don't want to make chicken and do that. I'd rather just eat a bowl of cereal or like an apple or something instead because it's just quicker, and I'm already really hungry.

Special Dietary Needs. Many athletes described how the demands of being an athlete required them to eat more than

their nonathlete peers to obtain enough nutrients and energy for success in their sport. Student-athletes who grocery shopped cited the increased price of healthy foods as a barrier to eating healthy diets:

... like being an athlete, you need more food and more protein to fuel your body, and that's like more money you have to spend, so being an athlete kind of makes it a little more difficult to like have enough food, I guess.

Limitations of the Campus Dining Hall. Student-athletes mentioned that both the options and quality of the food at the campus dining hall did not meet their needs. They commented on a lack of quality and healthy options, with an emphasis on healthy proteins. For some, the hours of the dining hall were also insufficient:

... this isn't what you should be eating. You just like can't do it right now... so you just have like a salad, but like you can't add any protein on it because the protein has sauces and everything, so you just want to eat clean, but you can't, so you eat less or just a salad.

and

... I wish [the dining hall] was open a little later because, when I get out of practice, especially if I don't have any food at home, like I would like to go to [the dining hall], but it closes at 9:00, and if I get out of practice at 8:00, I'll only have like 30 minutes...

Limited Kitchen Access. Many student-athletes lived in dormitory buildings that either did not have kitchens or did not have kitchens on every floor, which made it difficult for them to cook their own meals: "Yeah, like so [the kitchen is] only on the first floor though, so I'm on the fourth floor, so I have to go all the way down there if I'm gonna cook..."

Limited Meal Plan. For those without an unlimited meal plan, having to budget their limited swipes prohibited them from using the campus dining hall whenever they wanted. They sometimes relied on friends to swipe them into the dining hall, using guest swipes when they did not have enough swipes of their own: "... but I only have 25 [meal swipes], so it's like either I waste a swipe and then don't get a meal during the week, or I go to [the dining hall] and somebody swipes me in."

What Were the Consequences of Food Insecurity on Student-Athletes?

Athletic. Most student-athletes stated that not getting enough to eat affected their athletics and resulted in a lack of energy and inability to perform optimally. Other effects were losing weight and being more susceptible to injury:

I definitely see myself like exhausted through the day... at the end of practice, I'm just like... done, like so tired... I feel like most of the time, if I'm not performing well, it's because I didn't eat or like eat the right things.

Another person observed: "I'd say the main aspect is just maintaining weight, which like I can play, but if you can't maintain your weight, you can only play to a certain extent..."

Academic. Although participants primarily emphasized the effects of not eating on athletic performance, they experienced

similar effects on their academics, including not having enough energy to focus in class: "If you don't [eat], you get tired more fast [sic], and then concentrating in class is harder."

Stress. Being stressed about not having enough time to eat or grocery shop or having a limited budget to buy food were also concerns. Most student-athletes in this sample did not work a paying job due to the time required to be an athlete. Additionally, nearly all responded that food was at the top of their spending priorities: "... I definitely think about [money] every time I buy food because I'm an athlete, so I can't have a job... being a[n] NCAA athlete is a full-time job. You just don't get paid."

How Do Student-Athletes Cope With Food Insecurity?

Organization and Planning. Participants often planned times in their schedules to eat. One athlete evaluated her food-related needs based on her upcoming schedule:

I try to think ahead of, you know, the things I'm going to buy, and I'll try to think of, you know, what I'm going to eat for the next few days, and I try to think of if I have a game or something because, if I have a game, I know we're going to have a tailgate, which means I don't have to worry about making food for that night, and they give us extra food, so then I don't have to worry about, you know, eating another night.

Buying Generic Brands. Student-athletes chose generic brand products over the name-brand versions to save money on groceries. Other strategies were buying only essential items, buying food in bulk, and buying nonperishable food that lasted longer. An individual said:

Well, like when I go shopping, I try to say [sic] in like the healthy part, but then like there's stuff with the same things but in the cheaper areas, so like I go there because it's the same thing, but I'm just paying more for like a label, I guess...

Rationing. Some student-athletes rationed portions or ate less to ensure they had enough meals for the future. A few described using meal replacements as a strategy to save money. Some brought snacks, such as fruit and granola bars, with them so they had something to eat during the day:

... I guess, like if I'm making something, I'll try to like, if I'm making pasta, I'll try to use like a third of it rather than half because I know I'm going to want it later on, or say with chicken, if I make 2 pieces because I feel like I need that protein, I'll be like, well, I need that protein another day, so I'm just going to eat 1 today.

and

... I always bring snacks, and at [the dining hall], I grab fruit on the way out, so I have like an apple or like a banana or some kind of stuff.

Suggestions for the University

Participants had several ideas about how the university could better support student-athletes who were struggling with having enough to eat. The most popular suggestion was increasing meal swipes or meal plans for athletes. Other solutions were

improving the quality of food available, expanding the dining hall hours, making sure each campus dormitory had a kitchen available to students, providing nutrition education to athletes, increasing advertisements for food assistance resources on campus, expanding athletic funding to include food, improving the availability of healthy and affordable food options on campus, and creating healthy food locations in athletic buildings. Participants said: “The meal swipes is a big thing, like just like not unlimited swipes but like to be able to go to [the dining hall] like a couple times a day makes a big difference. . .,” and

I feel like we should definitely have some type of food thing in an athlete building in the field house. I don’t know, like with granola bars and like healthy foods . . . I wish we had it, like a room or storage just for food and that we could go there after practice and get something like very fast.

DISCUSSION

Student-athletes in this sample faced several barriers to food security. Most of these barriers reflected the demands of being student-athletes; busy academic and athletic schedules left them with less time and energy for cooking, grocery shopping, and eating. Additionally, participants felt they needed to eat more than their nonathlete peers and that the lack of healthy options in the campus dining hall prevented them from meeting their dietary needs. The increased price of healthy foods was also acted as a barrier for athletes trying to ingest enough nutritious foods. Athletes with limited kitchen access or meal plans faced further challenges. They coped with not having enough to eat using several strategies, such as organizing their time, buying generic-brand foods, and rationing food portions. Athletes without enough to eat found it difficult to perform well in both their athletic and academic lives.

Barriers to Food Security and the Socioecological Model

The socioecological model²² evaluates how social and environmental factors in an individual’s life influence health behaviors and outcomes. This model can be used to identify the barriers to food insecurity for student-athletes.

Intrapersonal factors are characteristics relating to the individual, ranging from demographics such as age and gender to financial resources and time management skills.²² Intrapersonal factors that contributed to student-athlete food insecurity were a lack of time and limited kitchen access. Earlier studies of student-athletes also demonstrated that time was an obstacle to eating properly. For example, among the reasons why NCAA Division II athletes left their teams was the burden of time constraints that kept them from working paying jobs that would provide the funds required to pay bills and purchase necessities.²³ Approximately 11% of Division II athletes in a study conducted by The Hope Center were unemployed, and 48% worked fewer than 20 hours per week.¹⁷ Similarly, most student-athletes in our sample did not work paying jobs; the time spent in their sport may have prevented them from doing so.

On June 21, 2021, the US Supreme Court prohibited the NCAA’s restrictions on education-related benefits, such as scholarships at graduate or vocational schools, for student-athletes. The Supreme Court also called on the NCAA to

provide legal justification for its remaining compensation rules that restrict student-athletes from receiving compensation or benefits from their institutions for playing on sports teams.²⁴ This is a promising step toward allowing student-athletes to be paid for their performance, which has the potential to increase food security by giving them the financial resources they need to maintain sufficient, healthy diets. Furthermore, by removing the cap on educational-related benefits universities are allowed to give athletes, student-athletes may be able to save money on their education or receive scholarship funds that would allow them to purchase better meal plans on campus or have more money to buy groceries.

Institutional factors are characteristics of organizations that individuals are a part of, such as school and work.²² The campus dining hall presented as an obstacle to athletes as the available options prevented them from following a diet that met their athletic demands. This finding was consistent with the results of research conducted among student-athletes at a midwestern university in which unhealthy foods such as sweets and sugary drinks were more readily available than fresh fruits and vegetables or lean meats.²⁵ In an investigation of the diets of female collegiate student-athletes, most participants reported their energy intake was significantly less than their estimated needs.²⁶ Our participants emphasized a lack of healthy proteins. Similarly, Shriver et al²⁶ determined that 50% of their sample did not meet the recommendations for daily protein intake. Inconvenient dining hall hours that overlapped with the times of games or practices is another factor that contributed to student-athlete food insecurity,¹⁵ as athletes in this study noted.

Consequences of Food Insecurity

Food insecurity had many effects on student-athletes. Athletic effects included decreased performance and trouble focusing during practice. Academic effects involved having less energy to focus in class as a result of food insecurity. These results support those of earlier authors found that hunger often affected student-athletes’ performance during games, practices, and classes.^{13–15} For example, approximately 35% of athletes in 1 study reported that hunger affected their athletic performance.¹³ Among Division III student-athletes, Brown et al¹⁶ observed that most of their participants believed that their academic and athletic performances and overall health would improve with increased access to food. Additional consequences of food insecurity cited by Brown et al¹⁶ were increased stress and weight loss or gain. These outcomes also mirrored comments from our respondents.

Coping With Food Insecurity

Student-athletes used a variety of methods to cope with food insecurity, such as time management; buying generic-brand items or less expensive, unhealthy food options; and rationing food. Similar coping methods have been demonstrated in which students with food insecurity were more likely to buy cheaper but less healthy foods,^{6,13} skip meals, or not eat for an entire day.^{13,14} Shriver et al²⁶ showed that athletes ate out on average of approximately 5 times per week, most commonly frequenting sandwich shops, Mexican restaurants, and fast-food places. Athletes may have selected those options due to their relative convenience and low price. Other students coped with food insecurity by

asking family or friends for food or money for food if they did not have enough.¹³

Suggestions for the University

Establishing on-campus food resources and programs may greatly improve food security for student-athletes. Hickey et al¹³ surveyed a group of college students that included student-athletes and found that a higher proportion reported they would be more likely to use on-campus resources than federal programs, such as SNAP, or external community programs. Our participants offered suggestions for on-campus resources, such as creating places to purchase healthy food in athletic buildings.

Another common suggestion from our respondents was expanding meal plans and dining hall hours for student-athletes. According to Brown et al,¹⁶ 18% of participants expressed that their meal plan funds were not enough to cover an entire semester. In the same study, 45% indicated that dining room hours conflicted with practice times.¹⁶ Conflicting hours and meal plan shortages may be contributing factors to athlete-student-athletes' food insecurity despite having meal plans. Expanding the hours of dining halls and number of swipes allotted to athletes may help alleviate these obstacles.

The quality of food and hours of operation at the campus dining hall was also a concern. Students in this study acknowledged a lack of healthy protein options and an abundance of fried, unhealthy foods. In the work of Shriver et al,²⁶ the female student-athletes did not meet the recommendations for daily protein or carbohydrate intake; furthermore, more than half of the sample characterized their diet as "fair" or "poor."²⁶ Ensuring healthy meal options at campus dining halls has the potential to greatly benefit the quality of student-athletes' diets. Offering the services of a sports nutritionist may also prove beneficial in educating student-athletes on how they can meet their daily dietary needs.

Limitations

Limitations of our work included possible researcher bias and the collection of self-reported data from student-athletes on the demographic questionnaire. Participants' answers may have been affected by the fact that the researcher (J.A.) was present while they filled out the questionnaire.

Additionally, only 1 athlete from the sample was on a club sports team; differences between the organizational structure of club sports and NCAA sports prevented us from including this individual. Further research examining differences between club sport and NCAA athletes would add new perspective to the literature on this topic. Due to these limitations, our results cannot be generalized to student-athletes beyond the sample population.

Nearly all participants identified as White (non-Hispanic); only 1 student-athlete identified as Hispanic. This distribution did not represent the overall student population at this university, which was much more diverse. For example, during the semester in which this study took place, approximately 12% of students identified as Hispanic or Latino, 17% as Black or African American, 3% as Asian, and 55% as White (non-Hispanic).²⁷ The use of convenience and snowball sampling may have contributed to the lack of racial diversity.

CONCLUSIONS

Student-athletes and nonathletes with food insecurity share certain challenges, such as finding the time to grocery shop, cook, and eat. However, we noted concerns unique to the student-athlete population, including the effects of food insecurity on athletic performance. More research is needed to further quantify the prevalence of food insecurity in the student-athlete population and identify more specific barriers to food security that are unique to this population. Future qualitative research will allow us to understand students' experiences and develop tailored solutions. College student food insecurity is a complex problem, and various solutions will be required for different student populations. To address food insecurity among student-athletes, additional examination will offer insight into how to develop and implement appropriately targeted programs and interventions.

Administrators of food assistance programs on college campuses may want to consider how to tailor their existing programs to student-athletes, such as providing healthy grab-and-go options to address the athletes' busy schedules. Supplying nutrition education to student-athletes may be another key intervention to improve food security and overall diet quality by educating athletes about the best ways to meet their unique dietary needs using their existing resources.

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Appendix A. Survey Questions^a

1. Age: _____
2. Ethnic Origin:
 1. American Indian/Alaskan Native
 2. Hispanic
 3. Asian/Pacific Islander
 4. White (non-Hispanic)
 5. Black (non-Hispanic)
 6. Other: _____
3. Gender:
 1. Male
 2. Female
 3. Prefer not to answer
4. Is your current residence as a student:
 1. On-campus
 2. Off-campus
- 4a. If you answered “off-campus” above, how many hours per week do you spend traveling to and from campus: _____
5. Where do you live?
 1. House/apartment/etc.
 2. Residence hall
3. On-campus apartment
4. Other: _____
6. Who do you live with?
 1. Alone
 2. With roommate(s)
 3. With parent(s)
 4. With spouse
 5. With children
7. Student Status:
 1. Full time (12+ credit)
 2. Part time (1-11 credits)
8. Classification:
 1. Freshman
 2. Sophomore
 3. Junior
 4. Senior
 5. Not seeking a degree
 6. Other: _____
9. How many hours per week do you work at a paying job? _____
10. How are you financing your education? _____

1. My own money
2. Work study
3. Scholarships/Grants
4. Student loans
5. Financial support from family/friends
6. All of the above
7. Other: _____

11. Do you have a meal plan?

1. No
2. Yes, unlimited
3. Yes, 12 meals/week
4. Yes, 15 meals/week
5. Yes, 25 Declining Balance
6. Yes, 40 Declining Balance
7. Yes, 80 Declining Balance

12. Are you a member of a NCAA team or a club sport team?

1. NCAA team
2. Club sport team

13. Which athletics team are you a member of?

1. Basketball
2. Cross country
3. Field hockey
4. Gymnastics
5. Lacrosse
6. Soccer
7. Softball
8. Swimming and diving
9. Track and field (indoor and outdoor)
10. Volleyball
11. Baseball
12. Football

14. Within the last year, how often have you used the following programs? (Please check one box for each program.)

The following are statements that people have made about their food situation. For these statements, please indicate whether the statement was often true, sometimes true, or

Program	Never	Sometimes	Often
SNAP			
WIC			
Children's food programs			
Food pantries			
Soup kitchens			
Campus programs			

never true for you in the last year.

15. The food that I bought just didn't last, and I didn't have money to get more. Was that often, sometimes, or never true for you in the last 12 months?

1. Often true
2. Sometimes true
3. Never true

16. I couldn't afford to eat balanced meals. Was that often, sometimes, or never true for you in the last 12 months?

1. Often true
2. Sometimes true
3. Never true

The following questions are being asked to measure your level of food insecurity. Please circle the most fitting answer to each question.

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

1. Yes
2. No

17a. If you responded "yes" above, how often did this happen – almost every month, some months but not every month, or in only 1 or 2 months?

1. Almost every month
2. Some months but not every month
3. Only in 1 or 2 months

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

1. Yes
2. No

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

1. Yes
2. No

^aInstrument is presented in its original format.

THANK YOU for taking the time to complete this survey!

Appendix B. Interview Questions Interview Guide^a

[BEFORE INTERVIEW] Thank you for participating in this research. I want to reiterate again that your participation in this project is completely voluntary. You can choose to not answer any question asked during the interview or end the interview at any time. This interview will be completely confidential and should last no more than 20 to 30 minutes. I want to again ask your permission to audio record this interview. The recording will be deleted as soon as it is transcribed. Thank you.

1. How frequently do you worry about getting enough food because of money?
2. In what ways, if any, was this (worrying about money for food) an issue for your family when you were a child?
3. What time of year, or what situations, make it harder or easier to get enough food?
4. During the semester, how does being in school affect getting enough food?
 - a. How does being an athlete affect getting enough food?
 - b. Is it harder or easier to get food when you are on campus?
5. Where do you get most of your food?
6. What food do you buy (or eat) when money is tight?

7. Do you eat foods you know are unhealthy instead of nutritious foods because of a lack of money?
 - a. Please give some examples.
 - b. Would you change your diet to include more nutritious food if you had more money?
8. Where does food fit into your spending priorities?
9. Besides money what makes it hard for you to get enough food, or enough healthy food:
 - a. Location of stores
 - b. No place to cook
 - c. Limited cooking skills
 - d. Lack of time for shopping and cooking
 - e. Anything else?
10. What kinds of things do you do to ensure you (your family) have enough food to eat?

- a. Which ones work best for you (your family)?
11. How has food insecurity affected your performance as a student athlete?
 - a. Time
 - b. Money
 - c. Stress
 - d. Academics
 - e. Energy (Athletics)
12. What do you think the University could do to help student athletes with food insecurity?

^aInstrument is presented in its original format.