

**FOOD INSECURITY AMONG MINORITY COLLEGE STUDENTS: A  
REAL PROBLEM?**

An Undergraduate Research Scholars Thesis

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## **ABSTRACT**

Food Insecurity Among Minority College Students: A Real Problem?

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Being part of the community is a process that is linked to other privileges in society. As Marshall stated, “citizenship is a status bestowed on those who are full members of the community” (1 Marshall, 1963: 87). People with the right to citizenship are benefited in many ways, but at the same time history demonstrates that citizenship is often a tool wielded to define inclusion and exclusion in vastly unequal ways because “citizenship operated as an instrument of social stratification” (1 Marshall, 1963: 78). This causes people that belong in minority groups to have fewer privileges and advantages, which may lead to food insecurity. “Food insecurity may occur when access to or availability of sufficient amounts of healthy, culturally-appropriate and nutritious foods are compromised, or when individuals cannot access these foods in socially-acceptable ways” (2 Gallegos et.al. 2013: 498). When people suffer from food insecurity their lives are greatly affected, with much attention focused on the impact to their health and performance at work or school, as “the association between food insecurity and poor health is likely to be a consequence of poor nutrition, stress associated with the inability to procure sufficient food, or both” (2 Gallegos et.al. 2013: 504). At the same time, “food insecure students were more likely than food secure students to report a lower GPA (2.0-2.49) versus a higher GPA (3.5-4.0)” thus showing the effect of food insecurity in grade point average (3 M.E. Maroto Et al. 2015: 515). It is well documented that minority groups are more likely than white groups

to suffer from food insecurity, however there is a lack of studies focusing on minority university students. The main purpose of this research is to find if students at Texas A&M are being affected by food insecurity, and if so, also determine if there is a link between food insecurity and ethnicity, for example, to find if there is a greater percentage of food insecure minority college students than white college students. Lastly, if there is a problem with food insecurity I would suggest different solutions to this problem as well as identify the stakeholders that need to address this problem.

## **DEDICATION**

I dedicate this thesis to my parents, Maria Davila and Martin Jauregui, who gave me life, who pushed me to my limits and made me realize that there is nothing I cannot overcome. A special gratitude goes to my uncle and aunt, Israel and Nora Nunez who have been there for me every single time I need them, and were my father and mother when my parents could not be. My brother and my sister, Martin and Elody, who may not always agree with all I do, but have always cared and loved me.

As well, I would like to dedicate this thesis to my siblings by heart, Ivory, Jeffray, Brandon and Angel, that even when I was almost a stranger to them, they still opened their home and heart to me. I am and will always be grateful to you all.

And last but not least, I would like to dedicate this thesis to Weixi Zhang, who has been there for me, who has inspired me to be more than what I was before and to never give up. Thank you for believing on me and what I am capable of achieving.

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I wish to thank my colleague, Hannah Klein, who worked with me for this past year on collecting and modifying data for this thesis. Thank you for working with me and helping me put all of this together. I would like to acknowledge all the teachers/ professors and mentors who have shaped me into who I am today, and who have taught me all I know.

Finally, I would like to thank all the people that provided feedback and were participants on this thesis, without you all, nothing of this would have been possible. You all are the foundation of my work and I am grateful for your time and openness.

# CHAPTER I

## INTRODUCTION

The community is an essential part of human life; from the day of our birth we belong to a community. As Frances Moore Lappe states, “community is our survival. We humans wither outside of community. It isn’t a luxury, a nice thing; community is essential to our well-being” (4 Lappe, 2005). Being part of the community is a process, which is linked to other privileges in society as Marshall stated, “citizenship is a status bestowed on those who are full members of the community” (1 Marshall, 1963: 87). This means that if we are considered a full member of the community, we have the right to citizenship. However, citizenship is not only connected to freedom and rights; rather, Marshall argued that “Citizenship has itself become, in certain respect, the architecture of legitimate social inequality” (1 Marshall, 1963: 73). This is because whoever lacks citizenship lacks the access to the same rights and privileges as those who do have it. These social inequalities can be seen throughout history, often linked to minority groups who were not fully accepted into the community and sex/gender status, where women lacked political community and citizenship rights. One of the greatest examples of exclusion of participation due to lack of citizenship can be connected to minority farmers in the United States, as “history discloses that minority farmers have faced barriers to entry into American Agriculture. These barriers have roots in prejudices, specially targeting race and citizenship status” (5 Mata et al. 2013: 8). By not allowing minority farmers the same rights and necessary help to participate in agriculture, a gap between minority farmers and white farmers was created and is still expanding. These racial minorities, which include Black/African American, Hispanics/Latinos, and Asians,

throughout United States history, have been excluded from participating in the political processes and have been oppressed in order to belong to a hierarchical community.

However, the farming gap is not the only one separating whites and ethnic minorities, for it is known that minority groups are more likely to be food insecure than white groups, which includes people who are European descendants since now Irish and Germans are classified as white as well. “National Level data show food insecurity/insufficiency is more common in Latino families than the dominant population” (6 Chavez et al. 2007: 197), and that “very low food security predicts obesity predominantly in Hispanic men and women” (7 Leung et al. 2012: 2234). Although there have been studies that focus on minority groups as a whole and the effects of food insecurity in their lives, there are not many studies that only limit their research to university students as a part of minority groups suffering from food insecurity. One study mainly concerning college students showed that “given the potential associations between academic achievement, chronic disease, and food insecurity, the presence of food insecurity among university students is likely to have a range of serious consequences in both the short and long term” (2 Gallegos et al. 2013: 498). As well as “food insecurity during these years can potentially affect college students' cognitive, academic, and psychosocial development” (8 Patton-López et al. 2014: 209). The results of another study “suggested that college students may be more likely than the general U.S. population to suffer from food insecurity” (3 M.E. Maroto et al. 2015: 524). Unfortunately, this conclusion has not been further investigated, and it is missing feasible solutions to the problem even when food insecurity has been noted to be a growing trend among college students (2 Gallegos et al. 2013: 503).



My study focuses on determining if Texas A&M has a problem of food insecurity and if it is affecting its students. If there is a problem at Texas A&M then I would like to find if minority college students tend to be more likely to suffer from food insecurity than white college students and if so, what are the reasons behind it. However, if the students at Texas A&M are not affected by food insecurity, then I would like to find the reasons why that is the case. This is important because “by effectively addressing the food issue, these approaches may facilitate student retention, enhance academic achievement and contribute to short and long term social, physical and mental health” (2 Gallegos et al. 2013: 507). The solutions to this problem will not only benefit college students’ lives by improving their diets and health condition, but will also be beneficial to the universities as they will profit from these changes as well; “by identifying strategies that work to alleviate food insecurity, universities could be in a win- win situation; simultaneously improving retention rates, while at the same time empowering students to complete their degree in a timely manner” (2 Gallegos et al. 2013: 508). This work needs to be done with effort not only coming from the students that are being affected, but as well from the universities and the surrounding community. With equal participation from these three entities, the changes that need to be made in order to alleviate food insecurity among college students can be effectively put in action.

## CHAPTER II

### METHODS

This study was approved by the Texas A&M Institutional Review Board (IRB2013-0764D).

Different methods of data collection were used, including the use of secondary and primary data.

My secondary data will consist of books, articles and outside data as well as other people's studies, which will be chosen by how great of a connection they have to the topic I am writing about along with the information they lack that could have been useful for this thesis.

My primary data was collected from a web-based survey, which was collected between January and February 2016. This survey was disseminated by the email list serve to a cohort of 58,000 students, corresponding to all enrollments in the University of Texas A&M<sup>1</sup>. The survey consists of thirteen questions and it was anonymous, with an option for respondents to self identify if they were willing to be contacted for a later interview. As well, respondents were offered the option of contacting Dr. Gatson to participate in a residential gardening program (9 everybodyeats.tamu.edu). A total of 1,000 students answered the survey during its active period of four weeks. Students were not offered any incentives to participate.

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<sup>1</sup> After the initial deployment of the approved online survey through face-to-face and snowball sampling produced 150 response, I sent out an approved bulk email to the student population of Texas A&M University in order to try to reach the sample size of 382 (N= 58577 in 2015; 95% Confidence Interval with a 5% margin or error).

## **Survey tool**

The survey tool was comprised of thirteen questions relevant to this study. The use of the items is described below. Information was sought on food security status and sociodemographic characteristics. (See Appendix A)

## **Food security status**

Sets of questions were asked in order to identify whether the student was food secure or food insecure. After those questions had been answered, a question was asked if they felt they were food insecure. The students had the option of choosing between: I feel I am food insecure, sometimes I feel food insecure and I have never felt food insecure. This question was later analyzed with their chosen answers from the other questions.

## **Sociodemographic characteristics**

Data on ethnical/ racial identification, gender, age, enrollment status, household type and location were collected. The participants were asked to indicate their age as well as how many years they have attended college. They were asked to specify their ethnicity; in order to find if food insecurity does have a direct correlation with being part of a minority group. Lastly, they were asked to indicate if they lived off campus/ on campus and which city they lived at. This was used to identify where do students feel the most insecure, if at all.

## **Fruit and vegetable consumption**

The consumption of fruits and vegetables were assessed by asking some multiple choice questions to indicate the amount of fruits and vegetables they buy every single time they go grocery shopping and the amount of money they spend on it. A question concerning frozen/

canned vegetables and fruits was included in order to compare them to the fresh fruits and vegetables, and find which one students are more likely to buy and how often.

### **Transportation**

Transportation was addressed as an important factor to determine if a person thinks of himself/herself as food insecure. A cross examination was directed between the method of transportation used by each student and how they perceived themselves (food insecure/food secure). A cross examination was directed between their method of transportation and the times that the student went grocery shopping.

I will also be collecting data by using the general ethnographic process of participant observation across the entire community. I will be doing this by observing the patterns and actions people take around me and in different situations that concern anything connected to food insecurity/security, food access, or anything related to my research. This is an engaging process that takes part when I am not participating in their activities or changing the environment, but only when they openly share information with me.

Even though Texas A&M may actually have fewer food insecurity problems than both other College Students/Universities and the segments of the larger Brazos Valley due to its size population and other programs happening around campus. I still hope to improve the accessibility and affordability of natural produce in this area, in order to alleviate any food insecurity that may be affecting college students and minorities in College Station and Bryan area.

## CHAPTER III

### RESULTS

Of the students who received the direct email to participate in this study, 1,000 responded which resulted in a response rate higher than expected. The sample of this study over-represented the White population, youngest age- group and female students. Of these, 43% of the sample indicated that they were feeling food insecure or sometimes felt food insecure while attending Texas A&M. Food security “exist when all people, at all times, have physical, social, and economical access to sufficient, safe and nutritious foods to meet their dietary needs and food preferences for an active and healthy life” (2 Gallegos et al. 2014: 497). Food insecurity exists when one or more factors mentioned before are not present. There was a great association between food insecurity and the student’s ethnicity, age, housing type, method of transportation, and the frequency that the students went grocery shopping.

As shown in Figure 1, 57% of the respondents reported that they never felt food insecure while attending Texas A&M. However, 43% of the population said that they are food insecure or that they sometimes feel food insecure. However, as shown in the table, out of that 57% of students who have never felt food insecure, 51% are White/ Not Hispanic students. Out of the 43% of students who indicated feeling food insecure, 31% belong to a minority group. These results show a correlation between ethnicity and food insecurity. The student population at Texas A&M as of 2015 was 57,934 students and out of that 38,432 were White only students (10 Texas Enrollment Profile Fall 2015). This allows us to see that the majority of the Texas A&M students are white only and that they make up more than half of the student population, which shows how

ethnically representative this survey was. However, if we take in consideration the amount of minority students who answered this survey and did state that they have felt or still feel food insecure, we can see a direct correlation between these two variables.

Figure 1 **Food Insecurity/ Security and Ethnicity**

	Total Respondents	Food Insecure	Food Secure
BASE	1,000	430	570
	100%	43%	57%
Ethnicity			
White/ Not Hispanic	640	122	518
	64%	12%	51.80%
White/ Hispanic	169	154	15
	16.90%	15.40%	1.50%
Black/ Not Hispanic	26	20	6
	2.60%	2%	0.60%
Asian/ Pacific Islander	106	84	22
	10.60%	8.40%	2.20%
Native American	4	3	1
	0.40%	0.30%	0.10%
White/ Asian	13	10	3
	1.30%	1%	0.30%
Hispanic	14	13	1
	1.40%	1.30%	0.10%
Indian	1	0	1
	0.10%	0%	0.10%
Middle Eastern	1	0	1
	0.10%	0%	0.10%
Pakistani	1	0	1
	0.10%	0%	0.10%
Black/ White	7	6	1
	0.70%	0.60%	0.10%
Black/ Hispanic	4	4	0
	0.40%	0.40%	0%
Asian/ Hispanic	3	3	0
	0.30%	0.30%	0%
Arabic	2	2	0
	0.20%	0.20%	0%
Middle Eastern/ Arab	2	2	0
	0.20%	0.20%	0%
Native American/ Hispanic	1	1	0

	0.10%	0.10%	0%
African	1	1	0
	0.10%	0.10%	0%
Middle Eastern/ White	1	1	0
	0.10%	0.10%	0%
Native American/ White	4	4	0
	0.40%	0.40%	0%

Another direct link that was visible while analyzing this data was the connection between gender and food insecurity. Although this survey was overly answered by women (68.90%), men seemed to be more affected by food insecurity than women did. As portrayed in Figure 2, women's responses make up twice the amount of men's responses. Women make up 68.9% of the total 100% of the responses and men only make up 30.8%. However, only 12.2% out of the 68.9% are presently feeling food insecure or have felt food insecure before. Moreover, out of the 30.8% of men's responses, more than half of them (16.5%) feel or have felt food insecure. This may be linked to the biases that are created between men and women as to who "belongs to the kitchen" and who does not. I state this because women in this study were more likely to report to included raw materials (vegetables) to cook with when they went shopping, unlike men who tried to not shop as much and if they did, they bought more canned/ frozen vegetables. We were also able to see that the people who identified themselves as neither male or female, felt food insecure. I cannot fully deduct if this is connected to discriminatory beliefs that still surround Texas A&M, so I believe that further research should involve this kind of topic.

Figure 2 **Food Insecurity/Security and Gender**

	Total Respondents	Food Insecure	Food Secure
BASE	1,000	430	570
	100%	43%	57%
<b>GENDER</b>			
Woman	689	262	427
	68.90%	26.20%	42.70%
Man	308	165	143
	30.80%	16.50%	14.30%
Demigirl	1	1	0
	0.10%	0.10%	0%
Gender Dysphoria	1	1	0
	0.10%	0.10%	0%
Agender	1	1	0
	0.10%	0.10%	0%

A strong correlation can be seen between the years a student has spent at Texas A&M and food insecurity. As shown in Figure 3, students who have been studying at Texas A&M for a longer period of time tend to feel more food insecure than those that have just arrived to college. For example, out of 392 students in their first year only 64 of them feel food insecure, which is only 6.4% and 328 of them have never felt food insecure, which makes up 32.8%. On the other hand, if we see the responses of the students who have been at Texas A&M for three years, we can see that out of 190 students, 156 of them feel or have felt food insecure, which is 15.6% of the total, with only 34 of them never experiencing food insecurity, making up 3.4%. The population that feels food insecure just on their third year of university is five times more than those who have never felt food insecure. This table shows that the longer the students spend in college, the more insecure they feel. This may be due to different reasons, which include living off campus, not visiting home as often as you would during your first year, expenses that cannot be covered by parents anymore and other reasons. However, we see a steady increase of food insecurity or the feeling of food insecurity as time progresses and college students surpass their first year.



Figure 3 **Food Insecurity/ Security and Years Attending Texas A&M**

	Total Respondents	Food Insecure	Food Secure
BASE	1,000	430	570
	100%	43%	57%
<b>Years in School</b>			
1 year	392	64	328
	39.20%	6.40%	32.80%
2 years	271	94	177
	27.10%	9.40%	17.70%
3 years	190	156	34
	19%	15.60%	3.40%
4 years	107	83	24
	10.70%	8.30%	2.40%
> 5 years	40	33	7
	0.40%	3.30%	0.70%

Food insecurity is correlated to many variables when it comes to college students due to the different factors that are involved in their daily lives. Another variable that food insecurity seems to be linked to here in College Station/Bryan is the location of where the students live, however, this connection is not as strong as the other variables. As shown in Figure 4, even when the number of people living on campus and off campus varies greatly, the percentages of people who feel food insecure and those who have never felt food insecure are not far apart. For example, out of the 24.65% of students who live on campus, 9.3% feel food insecure, and 15.3% have never felt food insecure. As for the 63.5% of the students who live off campus and live in college station, 29.4% feel food insecure and 34.1% have never felt food insecure. This is not such a clear illustration, but we are able to see that almost half of all the students, either living on campus or living off campus, have at one moment during their college life feel food insecure. This may vary depending on different variables; for example, if a student lives on campus he/she is more than likely to have a meal plan in order to have access to food. On the other hand, the

diets of the students who live off campus depend heavily on their method of transportation as well as the distance between home, school and local market.

Figure 4 **Food Insecurity/Security and Housing/ City**

BASE	Total Respondents	Food Insecure	Food Secure
	1,000	430	570
	100%	43%	57%
Housing/ City			
On Campus/College Station	246	93	153
	24.60%	9.30%	15.30%
Off Campus/ College Station	635	294	341
	63.50%	29.40%	34.10%
Off Campus/ Bryan	119	43	76
	11.90%	4.30%	7.60%

Just as ethnicity had a big association to the student’s statuses of food security, their transportation method had a strong correlation to how food insecure they felt. As shown in Figure 5, transportation has a huge influence on who feels food insecure and who does not. This is because once a person feels that they have a reliable form of transportation, then they don’t have to worry about how will they go shopping, how much they should buy, or even wonder when will be the next time they will be able to go shopping. For example, in Figure 5 we can see that out of the 46.5% of students that own a car, 43.6% of them have never felt food insecure and only 2.9% have. On the other hand, out of the 27.1% students who depend on the TAMU bus shuttle 18.2% feel food insecure and only 8.9% have never felt any kind of food insecurity. As well, students who ride a bike, walk, use their apartment shuttle, and other methods of transportation have a greater possibility of feeling some kind of food insecurity while attending college. This is important to notice because as it is known, the student population who are less

likely to own a car are those who come from a low income family, mostly first generation students or international students, who are only here for a short period of time.

This table is extremely useful because it shows that even when there is an available method of transportation that the university provides (TAMU shuttle), many of the students who use it still feel food insecure. One of the causes for this is that the bus shuttle is not as reliable as many college students wish it to be. For example, during the school breaks there is no form of transportation for those who do not own a car, a bike or know someone who can provide them with a ride. This however, mostly affects the international students who don't have relatives close by, or who need to stay behind in order to work or look for a job. As well, the TAMU bus shuttle runs relatively apart from each other, which makes it inconvenient for people who have a tight agenda. It created restraints on people's schedules and lives, which ultimately affects the times that people choose to go shopping as well as the amount of food they decide to buy.

In all, students who have a reliable form of transportation are less likely to report food insecurity throughout their college career. However, as mentioned before, this may be linked to ethnicity and belonging to a minority, because they are less likely to be able to afford a car for college. Even when the university provides a method of transportation for students' use, it may not always be as reliable and dependable as college students need it to be.

Figure 5 **Food Insecurity/Security and Transportation**

BASE	Total Respondents	Food Insecure	Food Secure
	1,000	430	570
	100%	43%	57%
<b>Transportation</b>			
Own Car	465	29	436
	46.50%	2.90%	43.60%
TAMU Bus Shuttle	271	182	89
	27.10%	18.20%	8.90%
Ride a bike	87	64	23
	8.70%	6.40%	2.30%
Walk	165	146	19
	16.50%	14.60%	1.90%
Apartment Shuttle	2	2	0
	0.20%	0.20%	0%
Skating/ Long Board	2	2	0
	0.20%	0.20%	0%
Rides/ Carpool	3	1	2
	0.30%	0.10%	0.20%
Motorcycles/ Scooters	3	2	1
	0.30%	0.20%	0.10%
Bryan Shuttle	2	2	0
	0.20%	0.20%	0%

Along with the other factors that affect food insecurity, the inclusion of the times a student goes shopping along with what they buy whenever they go shopping is important to determine if a student is food insecure or secure. In Figure 6, we are able to see how the least the students go shopping the more food insecure they feel. First, we can see that out of the 119 students that go shopping 2-3 times a week, only 49 of them felt food insecure. Then there are the students who only shop once a week, and out of those 610 students, 203 students feel food insecure and 407 students feel food secure. At this moment, people who feel insecure are half of those who feel food secure. After that, the people who only show once every two weeks or even the ones that shop once a month feel more food insecure than secure. Out of the 190 students who only shop every two weeks, 135 of them feel food insecure, which makes up more than twice than those

who have never felt food insecure. Here we see a direct correlation between the times a students is able to go shopping and food insecurity.

However, as stated before and in Figure 5, the times a student goes shopping depends on the method of transportation that student depends on. If they feel they have a secure form of transportation (their own automobile) then they are more likely to go shopping more than 2 times a week. However, when they only depend on the TAMU bus shuttle, or other form of transportation, they are more likely to shop one a week or even less than that. Due to this, we can see that transportation, the times a student goes shopping and ethnicity have a partial direct connection, which makes them interact and in a ay depend on each other. Lastly, we are able to see that the students who have a meal plan, are almost half as likely to feel food insecure as well, however that would be more related to the food provided in the school cafeteria or the fact that they cannot store or cook any food when they wish to.

Figure 6 **Food Insecurity/Security and Shopping Frequency**

BASE	Total Respondents	Food Insecure	Food Secure
	1,000	430	570
	100%	43%	57%
<b>Shopping Frequency</b>			
> 4 times a week	13	1	12
	1.30%	0.10%	1.20%
Between 2-3 times a week	119	49	70
	11.90%	4.90%	7%
Only once a week	610	203	407
	61%	20.30%	40.70%
Every 2 weeks	190	135	55
	19%	13.50%	5.50%
Once a month	52	35	17
	5.20%	3.50%	1.70%
Don't shop, Meal Plan	16	7	9
	1.60%	0.70%	0.90%

Adding to that, the amount of fresh food and vegetables a student buys every single time they go grocery shopping has an impact on their food security status. The students that answered this survey were asked to identify the percentage of fresh fruits and vegetables that makes up their cart when they go shopping. As you can see in the chart below, the students whose cart had more than 50% of fresh vegetables and fruits make up only 24% of the total population that answered this survey, and only 6.1% of them feel food insecure or have felt food insecure while attending college.

Similarly, the students whose cart has between 25% to 50% fresh vegetables and fruits make up 31.1% out of the total respondent population, with only 10.8% of them feeling food insecure and 20.3% never feeling food insecurity. However, at this point we can see that the students who feel food insecure are a little more than half of those who have never felt food insecure.

On the other hand, the students whose cart only contains 0% to 25% of fresh fruits and vegetables and the students who never buy fresh fruits and vegetables are the ones that were mostly affected by food insecurity. For example, the students who only have 0% to 25% of fresh fruits and vegetables in their cart make up 39.8% of the total respondents. Out of this amount, 21.4% have felt or feel food insecure and 18.4% have never felt food insecure. Here is visible that even when the percentages are close to each other, the students who only buy a small amount of fruits and vegetables are more likely to feel food insecure while attending college, than those whose cart is made out of at least more than 25% of fresh fruits and vegetables. Lastly, the students who do not buy fruits and vegetables when they go shopping, if they go shopping at all, are visibly affected by food insecurity. Although only 5.1% of the total

respondents don't buy fruits and vegetables, 4.7% of that felt or are feeling food insecure, with only .4% never feeling food insecurity. This allows us to see that the more a student buy fresh fruits and vegetables, the less likely that student is of feeling food insecure.

**Figure 7 Food Insecurity/Security and Percentage of Fresh Fruits/ Vegetables in cart**

BASE	Total Respondents	Food Insecure	Food Secure
	1,000	430	570
	100%	43%	57%

Percentage of Fresh Fruits/ vegetables

75% to 100% of fruits and vegetables in cart	52	3	49
	5.20%	0.30%	4.90%
50% to 75% of fruits and vegetables in cart	188	58	130
	18.80%	5.80%	13%
25% to 50% of fruits and vegetables in cart	311	108	203
	31.10%	10.80%	20.30%
0% to 25% of fruits and vegetables in cart	398	214	184
	39.80%	21.40%	18.40%
Don't buy fruits and vegetables	51	47	4
	5.10%	4.70%	0.40%

As Figure 7 showed the percentage of fresh fruits and vegetables in a student's cart, Figure 8 is focused on portraying the amount of frozen/ canned fruits and vegetables a student buys when they go grocery shopping. This question is important because even when the students do have food to eat (canned and frozen fruits and vegetables), they do not provide all the necessary nutrients that a student needs in order to perform to the best of their capabilities.

Figure 8 shows the percentage of frozen/canned fruits and vegetables that make up a student's cart when they go shopping. However, we are able to see that most of the students, from the ones whose cart is made up of frozen/canned fruits and vegetables to those that don't buy them at

all, feel food secure. This can be attributed to the students not feeling that frozen/canned fruits and vegetables affect the food security status, however, this would need further research.

**Figure 8 Food Insecurity/Security and Percentage of Frozen/Canned Fruits/ Vegetables in cart**

BASE	Total Respondents	Food Insecure	Food Secure
	1,000	430	570
	100%	43%	57%

Percentage of frozen/canned fruits and veggies

75% to 100% of frozen/ canned fruits and vegetables in cart	11 1.10%	4 0.40%	7 0.70%
50% to 75% of frozen/ canned fruits and vegetables in cart	63 6.30%	37 3.70%	26 2.60%
25% to 50% of frozen/ canned fruits and vegetables in cart	206 20.60%	102 10.20%	104 10.40%
0% to 25% of frozen/ canned fruits and vegetables in cart	504 50.40%	242 24.20%	262 26.20%
Don't buy frozen/ canned fruits and vegetables	216 21.60%	45 4.50%	171 17.10%

Lastly, the last direct connection that was drawn out from this research is the connection between food insecurity/ security and the money a student spends on fresh fruits and vegetables. This is connected to Figure 7, on the way that they both talk about fresh fruits and vegetables; however, the approach is different. This is because in Figure 7 the question that was asked was the percentage of fresh fruits and vegetables in their cart when they go shopping; however, even when they signaled that their cart is made up 50% of fruits and vegetables, they could still be spending less than \$10 dollars. For this reason, to know the amount of money a student spends



on fresh fruits and vegetables is essential to find if this variable is connected to their food security status.

Figure 9 demonstrates that the amount the students spend on fresh fruits and vegetables is directly connected to their food security status. For example, the students who only spend \$5 or less on fresh fruits and vegetables, are more likely to feel food insecure, than those who spend \$10 or more. The students who only buy \$5 or less worth of fruits and vegetables make up 17.7% of the total respondents, however, 15.3% of them felt or are feeling food insecure when only 2.4% have never felt food insecure. These students are six times more likely to feel food insecure than secure.

On the other hand, the students who spend between \$10- \$15 are more likely to feel food secure. As we can see, 28.8% out of the total respondents spend between \$10-\$15 on fruits and vegetables. Out of this, only 10.4% have felt or feel food insecure while attending Texas A&M. And 18.4% have never felt food insecure. This shows that the more a student spends on fresh fruits and vegetables, the less likely they are of feeling food insecure, and the better nutrition that they will have.

**Figure 9 Food Insecurity/Security and Money Spent on Fresh Fruits and Vegetables**

	Total Respondents	Food Insecure	Food Secure
<b>BASE</b>	1,000	430	570
	100%	43%	57%
<b>Money Spent on fresh fruits and vegetables</b>			
< \$5 on fresh fruits and vegetables	177	153	24
	17.70%	15.30%	2.40%
\$5-\$10 on fresh fruits and vegetables	292	147	145

	29.20%	14.70%	14.50%
\$10-\$15 on fresh fruits and vegetables	288	104	184
	28.80%	10.40%	18.40%
> \$15 on fresh fruits and vegetables	243	26	217
	24.30%	2.60%	21.70%

Overall, a direct link was found between food insecurity/ security and ethnicity, gender, years of education, housing status/ city, transportation, times a student goes grocery shopping, the percentage of fresh fruits and vegetables that make up their cart as well as frozen and canned, and the amount of money they spend every time they go shopping. However, a more in deep research should be conducted to learn how to tackle down the problem.

## **CHAPTER IV**

### **DISCUSSION**

The current study demonstrates that there is a problem of food insecurity at Texas A&M and that it is affecting minority college students the most. Although majority of the total respondents of this survey reported to have never felt food insecure, with fifty- seven percent of them stating that, forty-three percent of the student sample is experiencing or has experienced food insecurity while attending college. This shows that almost half of the 1,000 student survey respondents are at risk, or will be at risk, of experiencing food insecurity while in college. This is a significant problem because “given the potential correlation between reduced scholastic achievement and food insecurity, it is important to investigate how prevalent food insecurity is among college students” (11 Chaparro et al. 2009: 2097). However, this is the first research study that has been conducted at Texas A&M, which makes me to strongly believe that it should be expanded to a bigger pool of students and more research should be conducted.

The results from this survey show that at least two in every five students have felt or are currently feeling food insecure at Texas A&M. Some variants correlated to these findings are connected to ethnicity, gender, housing type, years of education as well as other variables. It was noticeable that the male students were more likely to report food insecurity than female students, which may be correlated to their knowledge on cooking with raw materials, or cooking as a whole. As well the students who have passed their first year of college tend to feel more food insecure than the ones who have been here for only a year, which may be connected to their meal plans or their assimilation to college life. These findings warrant further investigations in order

to aid in the development of effective strategies to improve students' food security statuses and their academic performance.

This study shows not only that the student population of Texas A&M is at great risk of experiencing food insecurity at one point of their tertiary education, but it also shows that minority college students are more likely to feel food insecure than white only college students. This is visible because out of the 430 students who reported to feeling food insecure, 308 of them belong to a minority group and only 122 of them are white only. These findings are shocking due to the large amount of white only responses, which make up 64% of the entire student population that answered this survey, and although minority groups only make up 26% of the total pool of students, they are still the ones that are being affected the most.

These findings may be associated with different factors that place minority college students at a higher risk than white only college students. These factors include the methods of transportation the students more often use, the number of times the students go grocery shopping a week or the amount of money that the students are able to spend on fresh fruits and vegetables, and other factors. When we look at the transportation methods that students use, the students who used their own cars were less likely to report feeling food insecure than the ones who didn't own a car. However as shown below in Figure 10, we can see that out of the 465 students that own a car, 437 are white only students while the other 28 are minority students. On the other hand, the students who mostly walk or ride a bike are more than likely to belong to a minority group, and as shown in Figure 5, those are the groups that feel the most food insecure. The TAMU bus shuttle is almost equally used by white college students and minority college students, however due to the difference in pool sizes of minority students and white only students, it is visible that

minorities mostly use the shuttle. These findings demonstrate that the students who do not have a secure form of transportation are more likely to report feeling food insecure than those who do have a secure transportation, like their own a car.

Figure 10 **Transportation and Ethnicity**

	Total Respondents	White only students	Minority students
BASE	1,000	640	360
	100%	64%	36%
Transportation			
Own Car	465	437	28
	46.50%	43.70%	2.80%
TAMU Bus Shuttle	271	151	120
	27.10%	15.10%	12.00%
Ride a bike	87	29	58
	8.70%	2.90%	5.80%
Walk	165	16	149
	16.50%	1.60%	14.90%
Other type of transportation	12	7	5
	1.20%	0.70%	0.50%

Other important variables that should be taken into consideration when identifying if a student is food secure or insecure is the frequency that the students go grocery shopping and the amount of money the students spend on fresh fruits and vegetables. The frequency that the students go grocery shopping it’s an important factor because it allows us to understand if this factor is directly or indirectly linked to their food security statuses. As shown in Figure 6, the students who went shopping more than once a week were more likely to report of never having experienced food insecurity than the ones who only went shopping once a week, every two weeks or less than that, and they were two to three times more likely to report feeling food insecurity. This is directly connected to the fact that minority college students tend to not own a

car, and depend on unreliable methods of transportations as shown in Figure 10. Therefore, the amount of times the students go shopping depends heavily on what kind of transportation they have access to. Minority college students then were more likely to only go shopping once a week if not even less than that.

The amount of money that the students spend every time they went grocery shopping on fresh food and vegetables, allows us to see the connection between their financial limits and their food security status. The student who spend more than \$10 dollars on fresh fruits and vegetables every single time they went shopping, were less likely to report feeling food insecurity than the ones who spent less than \$10 dollars. The amount of fresh fruits and vegetables that students ingest is essential to know because it displays the kind of nutrition that the students have while attending college. If the students spend less than \$10 dollars on vegetables and fruits when they go shopping, they are more than likely to have a poor nutrition, which will ultimately lead to food insecurity. This variable was used to determine if minority college students were more likely to be food insecure because it is indirectly connected to their method of transportation as well as the frequency that they go grocery shopping. As I noted above, minority college students are more likely to walk, ride a bike or use the TAMU shuttle as their main source of transportation than white only college students, as well they are more likely to only go shopping once a week or less than that. Lastly, they are more likely to spend less than \$10 dollars every single time they go shopping. At the same time we need to keep in consideration that college students cannot hold a full time job position, therefore, the student who are independent from their parents are at greater risk to experience food insecurity. As well, “student food insecurity is a problem that is likely to grow in prevalence as cost continue to surpass available grant and loan support” (12 Gaines et al.

2014: 382-83). All of these variables together allow us to see that minority college students are greatly affected by food insecurity or at great risk of being food insecure.

With this information all gathered, not only are we able to see that food insecurity is a problem that is affecting many students at Texas A&M University, but also at the same time we can see that minority college students are more susceptible than white only students to feeling food insecure. We could also identify several factors that are connected to food insecurity and that have an effect on the students' food security statuses. Two of those factors that have a great impact on the students' statuses include the method of transportation that the students use, and the frequency that the students are able to go shopping. However, those factors are directly connected because the amount of times a student goes shopping relies heavily on what transportation he/she has access to (car, bus, bike, etc.). In all, this study fills the knowledge gap about food insecurity among minority college students at Texas A&M and it provides further information about the factors that make a student feel food insecure.

However, further research will be conducted in order to fill the gap of this research by using extant interview data that are part of the Urban Re-Rural Project (IRB2013-0764D) previously performed by members of a collaborative research team that I am also part of. For these interviews I will be using Atlas.ti in order to code my data and format the content in order. I will be coding for specific words in order to reference to my work, for example: minority groups,

food insecurity, health issues, low income, college students, etc.; in addition I will be able to modify them, change their order, language or their concentration<sup>2</sup>.

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<sup>2</sup> Per Institutional Review Board regulations, this information can only be accessed in the assigned classroom for this project or my personal office, which has to be locked at all time when I am coding the information or opening the files.



## **CHAPTER V**

### **LIMITATIONS**

Although this study had a high response rate with more than 1,000 answered surveys, it had several discrepancies. One of these discrepancies is that the 1,000 students who took their time to answer this survey cannot fully represent the whole student population of Texas A&M University. This is a problem because it is a possibility that the prevalence of food insecurity in the sample to represent the whole student population is underestimating the prevalence of food insecurity at Texas A&M.

Another of these discrepancies is the over-representation of white only college students in the study, which actually represents the lack of diversity in the student body. This is an important factor because it didn't allow me to compare both, minority and white only college students in the same bases. Due to this, a survey that oversamples minority students should be collected. However, the extreme difference between numbers could have therefore affected my study and altered the results this study was able to put together.

Another limitation this study experienced is that women overly answered the surveys compared to men, with 68.90% of them being women and 31.3% being men. It is also well documented that females are more likely than males to respond to health surveys (13 Korkeila et al. 2001). This is a problem because it limited the data on gender diversity. It lacked a larger response of men in order to balance the results and in order to be able to compare if gender has a direct

connection to students' food security statuses. However, due to this factor there may be several discrepancies on the results of this study that would otherwise not be present.

Lastly, one of the greatest limitations of this study is that the students may not have the correct or clear definition of what being food insecure meant. I state this because all data collected was self-reported which leads to a potential for response bias. As well because many of the students who reported never feeling food insecure stated that they only went shopping once or less than one time a week, only bought less than \$10 dollars of fresh fruits and vegetables or that fruits and vegetables only made up 25% or less of their shopping cart when they went shopping. This shows that many students didn't feel food insecure just because they had access to food in general, which is not always beneficial for the health (hamburgers, pizza, etc.). Due to this, our data may have been affected, and the numbers could be not really show the reality of the situation.

## CHAPTER VI

### SOLUTIONS

The problem of food insecurity at Texas A&M needs to be addressed in order to help improve the students' retention rates and their university experiences. However, in order to address this situation, the Universities need to step in and make food insecurity one of their priorities. For example “there is a potential role for Universities to actively engage with government and welfare agencies to: advocate for the inclusion of food and nutrition needs within anti-poverty strategies, develop a systematic policy response for food price monitoring and modelling in relation to minimum wages and remoteness and to improve physical access to food outlets with reasonable prices” (2 Gallegos et al. 2014: 507)<sup>3</sup>. This means that the Universities can have the potential to address this problem that is affecting the student population if they work with local institutions and create new policies. By doing this, an exchange between the University and the students can be established. The University will be able to alleviate the students' food insecurity problem, and in exchange the students will better their performance at school and the retention rates will increase.

Other forms of plausible solutions may include food banks and pantries created by the University or local organizations close to campus, because the students who tend to be more food insecure lack of a reliable form of transportation. By creating food banks close to campus, and not something that can be accessed only if you use the bus or need a ride, then the student would be

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<sup>3</sup> The students have access to a student initiated on campus food pantry named 12<sup>th</sup> Can, which provides can foods to students twice a month. Howdy!Farm it's a student-run organic farm that sells fresh fruits, vegetables and meat to the public. They are both located in the Texas A&M campus.

more likely to use it and visit it more frequently. They will have a source of nutritious foods close to them and they will be able to access it every time they feel hungry, even between their classes.

Another possible strategy that the university and the student body can adopt is the creation and access to student gardens on campus. These gardens can be taken care of by student organizations that are interested on helping alleviate food insecurity in their own campus or by the resident assistants of the dorms on campus. They will be used in order to provide any student with fresh fruits and vegetables. They would be available throughout campus and they would be free to access at no cost. As well, students who do live off campus can set their own garden with the help of several organizations around the College Station/ Bryan area, like the one this study is part of. They will be provided with free soil, beds and seeds for their own personal gardens, and whatever they grow would be for their own personal use. If the students were not able to finish or consume everything they grew, then they would be able to donate it to the public food bank instead of throwing it away. However, all of these strategies mentioned before need to be considered in order to meet the remit of maintaining human dignity.

By effectively addressing this problem of food insecurity, not only would Texas A&M have a better retention rates, the students will have a better health with a balanced diet, they will be able to perform in school to the best of their capabilities and enhance their academic achievements. The possible solutions I have mentioned however are just some of the many out there. In order to make them work and actually alleviate the problem that is greatly affecting the Texas A&M student population, we need to work together and build a system that can last. If food insecurity is solved or improved in this campus, then we can serve as a model for the many other

universities around the United States, and share our own experiences and methods with them. By doing this, not only will Texas A&M be benefited by this change, but the Universities around the United States can be positively affected.

## **CHAPTER VII**

### **CONCLUSION**

This study provides compelling evidence of the existence of food insecurity among a sizable percentage of college students sampled at Texas A&M University in College Station. The results of this study suggest that a great percentage of the student population at Texas A&M may be at risk of experiencing food insecurity. Not only is the whole student population at risk, but also the study was able to find that minority college students have a greater risk than white only college students to experience food insecurity.

The study was able to find several factors that are directly correlated to the students' food security statuses. One major factor is the students' ethnical background. This information was used to find if minority college students were more likely to feel food insecure than white only college students, which proved my hypothesis correct. The students who belonged to a minority group were more likely than white only college student to report food insecurity even when most of the student population that answered the survey was made out of white only students. This is an important factor because it shows that even when the number of white only college students was greater than those of the minority students, there were more minority college students that reported to have felt or feeling food insecure than white only students. With this information in hand, we have to develop new ways to help minority students to come to college and have a decent and healthy life while continuing their education.

Other factors that affected the students' food security statuses were transportation and the number of times a student went shopping as well as what did they shopped for. Transportation had the greatest impact on the students' food security statuses because when they had a reliable source of transportation they were less likely to report food insecure. On the other hand, when they had to walk, ride a bike or in some times, ride the bus, the students reported to experience or to have experienced food insecurity while attending Texas A&M.

Besides transportation, the frequency in which the students were able to go shopping and the amount of fresh vegetables and fruits that they included in their cart had a direct impact on their food insecurity status. This is because "food insecurity was associated with lower consumption of fruits and vegetables" (2 Gallegos et al. 2014: 504). However, this factor is directly affected by the transportation method that the students have access to. This is because the student cannot buy and carry as much while using a bike or the TAMU bus as they could if they had access to a car. Therefore, the students who owned a car were more than likely to go more often grocery shopping and buy greater quantity of fresh foods than people who did not had a reliable source of transportation.

With these components in consideration, its more than clear to say that food insecurity is a big problem for Texas A&M because most of the student population is white only, therefore the minority groups are not taken into consideration often enough. However, even when the minority students cannot be even compared to white only students in numbers, they are still an essential part of this university, and if Texas A&M wants to become more diversified, it needs to adapt and help alleviate food insecurity.

In order to do this however, the University, the student organizations and the community have to come together in order to create plans and policies that will help alleviate food insecurity at Texas A&M. The need for solutions will increase as the number of minority college students attending A&M increases, and the problem will become more remarkable. Therefore, these institutions should start working now towards solutions to better the lives of the students at Texas A&M.

Although my research and this study gives great amount of information regarding this issue, there is a great need for further research in this topic. The lack of research concerning college students is something impressive and scary at the same time. This is because even when people in the United States know that a great amount of the population in the country are being affected by food insecurity daily, there is not special focus on looking into the people who are at most risk. I state that college students are at most risk because they are far from home, most of them don't receive financial help from parents and they lack cooking skills and knowledge. Therefore, I strongly believe that more research concerning this population should be conducted, in not only Texas but also all around the United States.

Food insecurity affects more than two out of five students at Texas A&M, and that was found in only one small-scale research. The student population keeps increasing every year, and with Texas A&M wanting to increase its minority population to a greater extent, the problem will grow as well. Therefore, I suggest that some of the solutions mentioned before be adapted and put in action in order to help the student population, because if nothing is done “the prevalence of food insecurity among university students is likely to have a range of serious consequences in both the short and long term” (2 Gallegos et al. 2014: 498)



In conclusion, this study is able to contribute to the body of literature and fill the knowledge gap about food insecurity among minority college students. It allows us to see what factors make a student feel food insecure and facilitates more understanding on why college students feel food insecure. The findings of this study are of great significance and they should be expanded. The research about food insecurity among college students and minority college student has not ended; on the contrary, this research is only the beginning of the acquisition of new knowledge that will contribute to this community.

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## APPENDIX

This is a copy of the survey that was distributed to the 1,000 students and the questions that were asked. This was then used to find if food insecurity was an issue at Texas A&M, if it affected mostly minority college students and the factors that contribute to this problem.

Howdy! My name is Heidi Jauregui and I am conducting this survey in order to gather more data for my thesis. This thesis focuses on Food insecurity at Texas A&M and is part of an already existing study, Urban Re-Rural: experiences in food access, production, and consumption in the Brazos Valley (TAMU IRB2013-0764D Approved: 02/10/2014 Expiration Date: 11/01/2016). I would really appreciate if you are able to answer this small survey and help me spread it around if possible. Thank you very much for your time!

1) Please specify your ethnicity

White, Not Hispanic

White, Hispanic

Black, Not Hispanic

Black, Hispanic

Asian, Pacific Islander

Native American

Other (please specify)

2) Please specify your gender

Woman

Man

Other (please specify)

3) How many years have you attended Texas A&M?

1 year

2 years

3 years

4 years

Other (please specify)

4) Please specify you age:

Do you live On Campus or Off Campus?

On Campus

Off Campus

5) Do you live in Bryan or College Station?

College Station, TX

Bryan, TX

Other (please Specify)

6) What method of transportation do you mostly use?

Drive my own car

Ride the TAMU and/ or Brazos transit

Ride a bike

Walk

Other (please specify)

7) Do you believe you are food insecure? (Meaning that you don't have appropriate transportation, money or otherwise lack access to fresh foods)

Yes, I believe I am food insecure

Sometimes I feel I am food insecure

No, I have never felt food insecure

8) How many times do you go food shopping a week?

More than four times a week

Two or three times a week

Only once a week

Other (please specify)

9) When you go food shopping, what percentage of your shopping cart consist of fresh fruits and vegetables?

Between 75% to 100%

Between 50% to 75%

Between 25% to 50%

Between 0% to 25%

I don't buy fruits and vegetables

10) What percentage of your shopping cart consists of frozen and/ or canned veggies and fruits?

Between 75% to 100%

Between 50% to 75%

Between 25% to 50%

Between 0% to 25%

I don't buy fruits and vegetables

11) How much money do you normally spend on fresh fruits and vegetables each time you go shopping?

Less than \$5.00

Between \$5.00 to \$10.00

Between \$10.00 to \$15.00

More than \$15.00

Other (please specify)

12) I would like to direct some in-depth interviews for this project. Would you be interested on being interviewed about food security/ insecurity at Texas A&M?

Yes, I am interested

No, I am not interested

Please leave your e-mail address below if you selected Yes previously

13) Lastly, would you be interested on having a vegetable garden in your residence?

Yes, I do

No, I don't

If yes, please contact Dr. Gatson for more information