

AN EXAMINATION OF NATIVE AMERICAN
HOUSEHOLD FOOD SECURITY IN OKLAHOMA

By

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AN EXAMINATION OF NATIVE AMERICAN
HOUSEHOLD FOOD SECURITY IN OKLAHOMA

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Abstract:

The hardships faced by citizens of the United States as a result of the recent “Great Recession” and other financial downturns have had the greatest impact upon groups from lower socioeconomic status (Andrews & Nord, 2009). One of the most basic human needs is food and the ability to access it. According to United States Department of Agriculture (USDA) reports, 14.9 percent of U.S. households were considered food insecure in 2011 as compared to fewer than 11 percent in 2007, thus more Americans are relying on some sort of food assistance program. There are multiple factors that contribute to food insecurity.

The goal of this study was to understand how different socioeconomic factors affect food security for Native Americans in Oklahoma. The three factors evaluated in this study were Native American’s household income, educational attainment, and employment status. By using the 18-item Core Food Security Module, Native American households were classified into different food security levels; an additional questionnaire addressed underlying problems or factors that contributed to food insecurity and issues relating to food assistance programs.

It was found that 35% of the Citizen Potawatomi Nation (CPN) of Shawnee surveyed were food insecure in 2013. Unemployment rates for CPN households were found to be higher (30.8%) than the national average of 7.6%. CPN household income levels of \$20,000 or more were found to be extremely lower than national levels, yet earnings below this level were higher. High school graduates and students entering into college were found to be higher than at the national level, however, there were more high school students dropping out and less college graduates than at the national level. It was discovered in this research that employment was closely correlated to food insecurity, along with educational attainment depending on various models. Just as predicted, food assistance programs are widely used throughout the tribe. Furthermore, this research alluded to the need for more research in terms of Native American food security and utilization of different food assistance programs.

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CHAPTER I

INTRODUCTION

Background

The hardships faced by citizens of the United States as a result of the recent “Great Recession” and other financial downturns have had the greatest impact upon groups from lower socioeconomic status. One of the most basic human needs is food and the ability to access it. The Food and Agriculture Organization (FAO 2002) defines food security as, “when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life”. According to United States Department of Agriculture reports, 14.9 percent of U.S. households were considered food insecure in 2011 as compared to fewer than 11 percent in 2007, thus more Americans are relying on some sort of food assistance program (Coleman-Jensen et al. 2012).

According to Cook and Jeng (2009, p. 6), “poverty is the main cause of food insecurity and hunger”. American Indians, a term including both Native Americans and Alaska Natives, are disadvantaged in many ways, particularly in terms of educational attainment and employment status (Huyser, Sakamoto, & Takei 2010). With regards to socioeconomic status, American Indians, especially those in rural areas, have the highest unemployment, lowest educational attainment, have been positioned in undesirable physical locations, and are small in population size compared with other ethnicities (Olson et al. 2004; U.S. Department of Education 2009; Leverett 2008; Algernon 2010; and Huyser, Sakamoto, & Takei 2010).

Purpose of Study

There is an enormous amount of research on food security on a national scale and even within certain ethnic groups. The food security of American Indians has been measured mainly in locations near or on reservations. However, Native Americans living in Oklahoma are not located on or near an Indian reservation, thus tribes in Oklahoma lack information on the severity of household food security among their citizens. With the unique diversity of 38 federal recognized tribes (Bureau of Indian Affairs 2010), Oklahoma tribes have been misrepresented in much of the research conducted on Native American issues. This research provides additional information to Oklahoma tribal leaders and policymakers about food insecurity issues within an Oklahoma tribe.

The purpose of this research is to provide American Indian communities, the general public, and law-makers with an understanding of the impact of socioeconomic status on the food security of American Indians. In addition, this research examines the importance of certain food assistance programs for tribal members. Investigating the number of American Indians who are considered food insecure, unemployed, lack education, and participate in federal food assistance programs are all important questions addressed in this study.

Problem Statement

If poverty is the leading cause of food insecurity, then the same socioeconomic factors that contribute to poverty potentially hinder American Indians from meeting the definition of food security.

Objectives

General Objective

The goal of this study is to understand how different socioeconomic factors affect food security for the Citizen Potawatomi Nation in Oklahoma. This research focuses not only on

household food insecurity, but also the factors which cause and contribute to American Indian households becoming classified as food insecure.

Specific Objectives

Four specific objectives were developed.

1. To determine the percentage of Native Americans within the tribe that are classified as food insecure;
2. To determine the impact of three socioeconomic factors: including education, employment and income, on food insecurity;
3. To evaluate participation in food assistance programs by Native Americans;
4. To provide information to tribal leaders and policy-makers to help address food security issues within Native American tribes in Oklahoma.

Scope of Study

Oklahoma tribes have a unique composition of tribal wealth, economic growth, educational attainment, employment opportunities, and scale than other tribes throughout Indian Country. The tribe represented in this research is a wealthier, larger, more economically prosperous tribe. The Citizen Potawatomi Nation (CPN) is located in Shawnee, Oklahoma.

CHAPTER II

REVIEW OF LITERATURE

Overview

Food Security

There is no doubt that the effects of multiple recessions in the U.S. and nutrition-related public health concerns have had the greatest impact upon groups from lower socioeconomic status. Studies confirm that during recessions food insecurity tends to rise, especially for lower-income households (Andrews and Nord 2009; Gundersen, Kreider, and Pepper 2011). According to United States Department of Agriculture (USDA) reports, 14.9 percent of U.S. households were considered food insecure in 2011 as compared to fewer than 11 percent in 2007, thus more Americans are relying on some sort of food assistance program (Coleman-Jensen et al. 2012). The largest food and nutrition assistance program in the U.S. is the Supplemental Nutrition Assistance Program (SNAP, also formerly known as Food Stamps), which in fiscal year (FY) 2012 served 46 million people with benefits exceeding \$74 billion (Cunyngham 2012).

Food security and the inverse, food insecurity, have been heavily researched and documented. From determinates to health consequences, food security has been analyzed on different levels (for recent work, see e.g., Coleman-Jensen et al. 2012; Mullany et al. 2012; Jernigan et al. 2011; Finegold et al. 2009; Companion 2008; Gordon and Oddo 2012; Galloway 2005; Gundersen 2007; Gundersen, Kreider, and Pepper 2011; and Ratcliffe, McKernan, and Zhang 2011). However, as Gundersen (2007) points out, very few studies have researched

food insecurity among American Indians. The few studies that have focused on food insecurity among American Indians have typically focused on certain reservations throughout Indian country. However, Gundersen (2007) was the first to look at food insecurity for American Indians on a national level in terms of the extent, depth, and severity. He examined food insecurity among American Indians using the 18-item Core Food Security Module (CFSM), developed by USDA, and found that “American Indians have higher levels of food insecurity than non-American Indians” (Gundersen 2007, p. 211-212). Gundersen (2007) also found that even if he controlled for certain limited economic opportunities that create hardships among American Indians, they would still have higher levels of food insecurity. Interestingly enough, he found that households without children have a higher prevalence of being classified as a household that displays food insecurity and food insecurity with hunger.

In a study by Nord, Andrews, and Carlson (2008), households that had children present and were classified as “low food security” and “very low food security” increased significantly from 2005 to 2007. From 2005 to 2007, “low food security” households with children increased by 32,000 more children. During that same two-year span, “very low food security” households with children also increased by 85,000 more children. Thus, in 2007, the total number of children living in a household that was classified as “very low food security” reached 691,000. Nord et al. (2008) also illustrated that depending on the household type the rate of food insecurity varies significantly. These household types included ethnic populations, households with children, and households with children that were headed by single women were all more likely than their counterparts to have a higher prevalence of food insecurity. Finally, Nord, Andrews, and Carlson (2008) found that households with an income below the Federal poverty level accounted for 37.7% of the study population and were the most likely to be classified as food insecure.

Surveying American Indians

In 2010, American Indians (single race) only accounted for 0.9 percent of the total U.S. population (United States Department of Commerce, Bureau of the Census 2011), which creates a host of data analysis problems because they are extremely small in size. Many national surveys do not include them separately as an ethnic group, but rather combine them in the total or a mix of “other” (Ericksen 1997). The 2010 Census revealed that over 70 percent of American Indians live in the western parts of the United States (United States Department of Commerce, Bureau of the Census 2011). The Bureau of Indian Affairs creates a list of federally and state recognized tribes in the U.S. In a recent report, over 600 tribes were federally and state recognized (Bureau of Indian Affairs 2010).

Because of their population size and remoteness, American Indians have been labeled by some as a “hard-to-reach” population (Lavelle, Larsen, Gundersen 2009). A few reasons for this title are the fact that American Indians are minorities, live in rural locations, and have low educational attainment levels. Lavelle, Larsen, and Gundersen (2009) point out several challenges that surround surveying American Indians, such as different definitions for tribal members, inaccurate address lists, lack of telecommunication, isolated geographical location, cultural and language barriers, and a sense of distrust that American Indians have towards the U.S. government and non-American Indians. The researchers found that:

[f]or studies on American Indian reservations, the literature strongly points to the need for full and active partnerships between American Indian communities and outside researchers in order to ensure that the communities are respected, protected, and benefit from the research, as well as to improve the quality of data collected in American Indian communities. (Lavelle, Larsen, and Gundersen 2009, p. 399)

Defining Food Security

One of the most basic human needs is food and the ability to access it. It is important to understand the term food security. The Food and Agriculture Organization (FAO, 2002) defines food security as, “when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life”.

Review of Food Security Measure

The level of food security is mainly measured with binary variables; food secure or food insecure. However, there are also methods for creating broader categories such as food secure, food insecure, and food insecure with hunger. The Current Population Survey (CPS) has been used for many decades in the U.S. to provide information to the public and policy-makers about employment, earnings, and education of survey respondents. In 1995, an addition to the survey was implemented regarding food security (Gundersen 2007). Over the years, USDA has redefined the questions that are asked in the CPS. For a complete history of measuring food insecurity see Gundersen (2007). Currently, the questions have been narrowed down to 18 official questions that measure food insecurity in the Core Food Security Module (CFSM) (Gundersen 2007). If a household has children present, then all 18 questions would be asked. If the household did not have children present, then only the first 10 questions would be asked to the respondent. In the simplest form, questions 1-10 are classified as the U.S. Adult Food Security Scale and questions 11-18 are classified as the U.S. Children Food Security Scale, combined as the U.S. Household Food Security Scale. Some of the questions in the CFSM include: “The food that I bought just didn’t last, and I didn’t have money to get more,”; “Were you ever hungry but did not eat because you couldn’t afford enough food?”; “We couldn’t afford to eat balanced meals,”; “I relied on only a few kinds of low-cost food to feed my child because I was running out of money to buy

food,”; and “did you ever cut the size of any of the children’s meals because there wasn’t enough money for food?”. For a complete list of questions in the CFSM, please see Appendix A.

When examining the questions asked in the CFSM, they are designed to intensify in severity for households with and without children. As Gundersen, Kreider, and Pepper (2011, p. 283) alluded, the questions are “qualified by the proviso that the conditions are due to financial constraints.” To determine if the household is food secure, food insecure, or food insecure with hunger, the number of affirmative responses are added and make up its raw score. Additionally, these classifications can be broken into categories that include hunger conditions (food secure; food insecure without hunger; food insecure with hunger, moderate; and food insecure with hunger, severe). To see how this is measured, please see Table 1; adopted from Bickel et al. (2000).

Determinates of Food Insecurity

Compared to the total U.S. population, Gordon and Oddo (2012) found some significant characteristics among American Indian tribes that potentially affect food insecurity. See Figure 1 for the actual data that Gordon and Oddo (2012) compiled using U.S. Census data. As shown in Figure 1, American Indians had the highest poverty rate compared to all other ethnic groups in the United States in 2010. Cook and Jeng (2009, p. 6) stated that “poverty is the main cause of food insecurity and hunger”. As indicated, American Indians experience many disadvantages such as acquiring an education and obtaining employment, all of which consequently contributes to their poverty status. Therefore, if poverty is the leading cause of food insecurity, lack of education and employment are key contributors to not only their low socioeconomic status, but also food insecurity. While many factors contribute to food insecurity, this study evaluates the impact of geographical location, educational attainment, and employment status on the food security of Native Americans.

Geographical Constraints

Location matters because “rural areas have some unique characteristics affecting food availability and acquisition that might contribute to the higher prevalence of food insecurity in nonmetropolitan areas-including the limited number of supermarkets, limited availability of food items, and high relative costs of food” (Olson et al. 2004, p. 12). In 2001, the prevalence of food insecurity in metropolitan and nonmetropolitan households was 7.7 percent and 11.5 percent, respectively, and was common (almost 50 percent) among rural low-income households (Olson et al., 2004). Huyser, Sakamoto, and Takei (2010) discovered that American Indians living in rural areas have higher poverty rates, along with many other low socio-economic characteristics, than other American Indians living in metropolitan areas or in areas without tribal lands.

Educational Attainment

American Indians have among the lowest educational attainment rates in comparison to other racial/ethnic populations in the country (U.S. Department of Education 2009; Leverett 2008). Breaking down education into elementary, secondary, and post secondary categories illuminates how disadvantaged American Indians are when it comes to their education. A national study in the U.S. found around 20 percent of fourth and eighth graders attend schools in rural areas, and over 45 percent of these are American Indians (U.S. Department of Education 2009). In 2009, fourth grade American Indian “students attending schools in rural locations scored lower in both reading and mathematics than their counterparts attending schools in other locations” (U.S. Department of Education 2009, p. 3).

According to the U.S. Census Bureau (United States Department of Commerce, Bureau of the Census 2009), 76.4 percent of American Indians (alone) graduated from high school or higher. This was the lowest percentage compared to Whites, Asians, and African Americans (alone).

The level of college education among American Indians is extremely low. “The percentage of American Indians who have at least a bachelor’s degree is the lowest” (Leverett, 2008, p. 3), in comparison to all other ethnic/racial groups. In 2000, the number of American Indians that pursued higher education was 42 percent, but only 13 percent attained their bachelor’s degree or higher (Leverett, 2008). In 2009, still only 13 percent of American Indians (alone) had received a bachelor’s degree or higher (United States Department of Commerce, Bureau of the Census 2009). Summarizing educational achievement for American Indians shows that they have a serious lack of schooling in comparison to other ethnic/racial groups.

Employment Opportunities

The most pressing issue right now is the economic disparity that occurs between American Indians and the general U.S. population (Algernon 2010). In 2007, before the recession, the unemployment rate for American Indians was 7.5 percent. In 2010, the unemployment rate among American Indians rose to 15.2 percent on a national average (Algernon 2010). American Indians in the Midwest experienced the greatest change in unemployment, jumping from 9.0 percent in 2007 to 19.3 percent by the first half of 2010 (Algernon 2010). Even though Alaska did not have the largest change, American Indians in Alaska still experienced the highest level of unemployment rates in the U.S. increasing from 15.1 percent in 2007 to 21.3 percent by the first half of 2010 (Algernon 2010). The region with the lowest unemployment for American Indians was in the Southern Plains at 12.0 percent by the first half of 2010, higher than the lowest unemployment rate by region for Whites (Algernon 2010). “Unemployment typically continues to worsen for some time after the end of a recession, and the evidence from the 2001 recession suggests that this may also be true of food insecurity, which is closely linked to employment” (Andrew and Nord 2009, p. 34). Research has also shown that regions where whites have the lowest unemployment rates, American Indians have the highest unemployment rates (Algernon 2010).

Alleviating Food Hardships through Assistance Programs

The U.S. is considered as one of the most prosperous nations in the world. However, 14.9 percent, or 17.9 million, of U.S. households were considered food insecure in 2011 (Coleman-Jensen et al. 2012). Through USDA's 15 different domestic food assistance programs, a record level of \$103.3 billion in food assistance (FY 2011) was distributed to low-income families and children in the United States (Oliveira 2012). Overall, about 1 in every 4 Americans were provided with food assistance in FY 2011 (Oliveira 2012). Every food assistance program serves a different and very specific purpose.

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) provides not only food assistance for women and children, but also nutrition education and healthcare and social services referrals for an average of 9 million (per month) women, infants, and children in the U.S in FY 2011 (Oliveira 2012). WIC is available in all 50 States, 34 Indian Tribal Organizations (ITOs), and other U.S. approved territories. According to WIC Guidelines, for a person to become eligible for WIC, they must fall at or below 185 percent of the U.S. Poverty Income Guidelines (currently \$20,665 for a single person family or \$42,643 for a family of four) (U.S. Department of Agriculture 2011). Additionally, a pregnant, postpartum, or breastfeeding woman, infant, or child up to the age of 5 must be deemed a "nutrition risk" by someone in the health profession. Participants in WIC receive checks, vouchers, or an electronic benefit transfer (EBT) card, depending on their location, to purchase approved foods (please see Figure 2 to see the approved food items in WIC). In FY 2012, WIC was appropriated \$6.618 billion by Congress (U.S. Department of Agriculture 2012a).

The Supplemental Nutrition Assistance Program (SNAP) is seen as the "first line of defense against hunger and is designed to reduce food-related hardships" (Ratcliffe, McKernan, Zhang 2011, p.1) for an average of 44.7 million persons (per month) in the U.S. in FY 2011

(Oliveira 2012). SNAP is also available in all 50 States, U.S. approved territories, and through ITOs. For a person or household to receive SNAP benefits, they must meet certain tests which include both resource and income tests. To see how these tests are determined, please see SNAPs Fact Sheet on Resources, Income, and Benefits (U.S. Department of Agriculture 2013). In regards to income, households must meet the income test which consists of both a gross and net income tests. However, households with an elderly person (person over 60) or a person receiving certain types of disability benefits only have to meet the net income test. Table 2 breaks down the different income tests that households must meet in order to receive SNAP benefits (U.S. Department of Agriculture 2013). For example, a four-person household, without an elder or a person receiving disability benefits, must have a monthly gross income at or below \$2,498 and a monthly net income at or below \$1,921. Table 3 breaks down the benefits that SNAP participates received since October 2012 and will continue to receive until September 2013 (U.S. Department of Agriculture 2013). For example, a four-person household receives a maximum monthly allotment of \$668 in SNAP.

Another food assistance program that is specifically designed for American Indians is the Food Distribution Program on Indian Reservations (FDPIR). FDPIR was created to ease the challenge some reservation residents had traveling to SNAP offices and grocery stores to acquire their food items (Finegold et al. 2009). This program provides USDA approved foods to low-income American Indian households that live on an Indian reservation, in approved Indian housing near reservations, or in various locations in Oklahoma (see Figure 3 for the list of approved foods). According to a recent FDPIR Fact Sheet (U.S. Department of Agriculture 2012b), FDPIR was distributed to approximately 276 tribes through 100 ITOs and 5 State agencies as of March 2012. In FY 2011, average monthly participation in FDPIR was 77,827 individuals. A reported \$102.75 million was appropriated for FDPIR in FY 2012. FDPIR is seen as an alternative to SNAP. Participants in FDPIR cannot participate in SNAP in the same month;

they must choose one or the other. Participants receive a “food basket” of goods at a selected location near the tribe every month.

A recent study by Finegold et al. (2009) examined the differences in SNAP and FDPIR. Assigning an actual retail value to the FDPIR package is much easier than for SNAP benefits. In FY 2006, a 3-person household eligible for FDPIR received a package valued at \$215.06 (Kirlin 2007). Given that same household size, the maximum SNAP allotment was substantially higher. “The value of the FDPIR package comes closer to median SNAP/FSP benefits for larger households than for households of one to four, and actually exceeds the median benefits for households of seven or eight” (Finegold et al. 2009, p.38). For a family of four that is eligible for both programs and earns between \$0 and \$1,024, the family would be better off with SNAP. If this family earned between \$1,025 and \$2,238, it would be better off with FDPIR than SNAP. Finally, if this same family now earned \$2,239 to \$2,330, the only program that they would be eligible for is FDPIR.

It is also important to point out that there are many more programs designed to serve solely elders, tribal members on or near reservations, or school aged children. The underlying mission of these different food assistance programs is to reduce food-related hardships, such as food insecurity.

The recent economic downturn consequently caused a sharp increase in the number of individuals enrolled in food assistance programs, thus more attention has been focused on the effectiveness of these programs. In a recent study by Ratcliffe, McKernan, Zhang (2011), benefits from SNAP were found to reduce the likelihood of an individual becoming classified as food insecure by nearly 30 percent and classification as very food insecure by 20 percent. Another study by Nord and Golla (2009) found that entry into SNAP reduces food insecurity by one-third. In a comparison of FDPIR and SNAP, a study found that some American Indians (13 percent in

an average month) received benefits from FDPIR that were not eligible for SNAP (Finegold et al. 2009). Additionally, “41 percent of the households eligible for FDPIR are eligible for SNAP/FSP but the retail value of their FDPIR commodities exceeds the SNAP/FSP benefit for which they would be eligible” (Finegold et al. 2009, p. 53). Finegold et al. (2009) also point out that households that have instability in their monthly income should enroll in SNAP when their income is lower and enroll in FDPIR when their monthly income is slightly higher.

Health Concerns from Food Insecurity

It is also important to mention why food insecurity is such an international concern for human health. Food insecurity is well documented for its adverse health effects (Galloway 2005; Finegold et al. 2009; Story et al. 1999; Jackson 1986; Strauss et al. 1997; U.S. Department of Health & Human Services 2012; Companion 2008; Jyoti, Frongillo, and Jones 2005; Olson 1999; Bhattacharya, Currie, and Haider 2004; and Borjas 2004). Whether these health concerns are malnutrition, hunger, cardiovascular disease, Type II diabetes, or even obesity, American Indians are seeing the effects like never before. According to Companion (2008, p. 4):

As a result of both the removal and reservation phases, tribal health across the nation began a series of devastating declines. Removed from traditional hunting and gathering places and confined into smaller areas, tribes began a dietary and physical activity shift away from consumption of traditional foods and high energy expenditures and towards a pattern of more sedentary lifestyle and increasingly nutritive-limited and processed foods.

It is believed among researchers and health professionals that American Indian obesity was practically non-existent before the 1940's, with a few exceptions for American Indian reservations in the southwest (Broussard et al. 1991; Story et al. 1999; Jackson 1986; and Companion 2008). Since the 1940's, obesity has increased dramatically for American Indians. “The magnitude of the obesity problem in American Indians is not well understood or

documented. American Indians are not represented in most national health and nutrition surveys, particularly the National Health and Nutrition Examination Surveys (NHANES I and II)” (Broussard et al. 1991).

Because of their lifestyle change, American Indians currently face health concerns that are extremely alarming. According to the U.S. Department of Health & Human Services (2012), American Indian (and Alaska Native) adults were twice as likely as white adults to be diagnosed with diabetes and were 1.8 times more likely to die from diabetes than non-Hispanic whites in 2009. Additionally, on average they are “more likely to be obese than white adults, more likely to have high blood pressure, and they are more likely to be current cigarette smokers than white adults” (U.S. Department of Health & Human Services 2012), all of which reveals the fact that they are more likely to be diagnosed with heart disease than their white counterparts. In regard to children, “American Indian and Alaska Native children have approximately twice the levels of food insecurity, obesity, and Type II diabetes, relative to the averages for all U.S. children of similar ages” (Finegold et al. 2009, p. vi). In conclusion, there are many contributing factors that affect the health outcome for American Indians; however, socioeconomic factors such as poverty, low educational levels, and high unemployment rates, are among the leading contributors.

Summary

Once again, there is no doubt that the effects of multiple recessions in the U.S. and nutrition-related public health concerns have had the greatest impact upon groups from lower socioeconomic status. Not only is there vast amounts of research on food insecurity, but also numerous studies now confirm that during recessions, food insecurity tends to rise, especially for lower-income households. However, largely missing is research on food insecurity among American Indians. Most studies that look at food insecurity among American Indians focus on certain regions of the U.S. and tribes that are located within a reservation or near a reservation.

Few studies have evaluated food insecurity among American Indians on a national level. Most surprising, is the fact that Oklahoma has 38 federally recognized tribes, but no known evaluation of food security status has been evaluated. There are many factors, such as education, income, employment, and geographical location, that affect food insecurity. Because of the many disadvantages that afflict American Indians, more rely on food assistance programs. As previously mentioned, studies confirm that participating in certain food assistance programs reduces the likelihood of being classified as food insecure or even worse, very food insecure. Current research has established a need for further investigation into tribal food security.

Table 1. Food Security Scale Values and Status Levels Corresponding to Number of Affirmative Responses				
Number of Affirmative Responses:		1998 Food Security Scale Values	Food Security Status Level	
(Out of 18) Households With Children	(Out of 10) Households Without Children		Code	Category
0	0	0.0	0	Food Secure
1		1.0		
	1	1.2		
2	2	1.8 2.2		
3		2.4	1	Food Insecure Without Hunger
4		3.0		
	3	3.0		
5	4	3.4 3.7		
6		3.9		
7	5	4.3 4.4		
8		4.7	2	Food Insecure With Hunger, Moderate
	6	5.0		
9		5.1		
10	7	5.5 5.7		
11		5.9		
12	8	6.3 6.4		
13		6.6	3	Food Insecure With Hunger, Severe
14		7.0		
	9	7.2		
15	10	7.4 7.9		
16		8.0		
17		8.7		
18		9.3		

Note: adopted from Bickel et al. (2000) Guide to Measuring Household Food Security: Revised 2000.

	AI/AN Alone		Black or African American Alone		White Alone		Hispanic or Latino (All Races)		U.S. Total Population	
	N	%	N	%	N	%	N	%	N	%
Total Population ^a	2,932,248	100	38,929,319	100	223,553,265	100	50,477,594	100	308,745,538	100
Percentage of U.S. Population ^a		0.9		12.6		72.4		16.3		100
Population by Age ^a										
< 5 years	244,615	8.3	2,902,590	7.5	12,795,675	5.7	5,114,488	10.1	20,201,362	6.5
5–9 years	243,259	8.3	2,882,597	7.4	13,293,799	5.9	4,790,771	9.5	20,348,657	6.6
10–14 years	245,049	8.4	3,034,266	7.8	13,737,332	6.1	4,525,242	9.0	20,677,194	6.7
15–19 years	263,805	9.0	3,448,051	8.9	14,620,638	6.5	4,532,155	9.0	22,040,343	7.1
≥ 20 years	1,935,520	66.0	28,088,003	72.2	169,105,821	75.6	31,514,938	62.4	225,477,982	73.1
Educational Attainment ^b										
Less than 9th grade	134,144	8.9	1,243,847	5.3	7,804,932	5.0	6,148,937	22.5	12,461,624	6.1
9th to 12th grade, no diploma	207,091	13.8	3,010,139	12.8	11,492,936	7.3	4,172,326	15.3	16,955,981	8.3
High school diploma or equivalent	461,653	30.7	7,458,620	31.7	45,587,413	29.0	7,224,578	26.5	58,222,345	28.5
Some college, no degree	384,512	25.5	5,852,043	24.9	33,715,436	21.4	4,708,625	17.2	43,513,542	21.3
Associate's degree	114,905	7.6	1,752,795	7.4	12,348,730	7.8	1,497,794	5.5	15,525,958	7.6
Bachelor's degree	133,579	8.9	2,747,713	11.7	29,268,752	18.6	2,431,354	8.9	36,159,141	17.7
Graduate degree	67,644	4.5	1,465,489	6.2	17,219,003	10.9	1,130,382	4.1	21,246,049	10.4
Number of Households ^a	939,707	32.0	14,129,983	36.3	89,754,352	40.1	13,461,366	26.7	116,716,292	37.8
Average Household Size ^a	3.01	NA	2.63	NA	2.46	NA	3.52	NA	2.58	NA
Population Below Poverty Level in Past 12 months ^b	701,213	28.4	10,099,631	27.1	27,951,752	12.5	12,306,535	24.8	46,215,956	15.3
Households with Income Below Poverty Level in Past 12 months ^b	132,017	23.7	2,030,834	23.3	5,112,925	8.7	2,300,703	22.2	8,598,062	11.3
Households Received Food Stamps/SNAP in the Past 12 Months ^b	197,932	24.3	3,587,600	26.1	8,295,458	9.3	2,741,108	20.7	14,535,659	12.7
Notes:	Data presented are for American Indians and Alaska Natives (AI/ANs) alone (0.9 percent of U.S. population); the total population for AI/ANs in combination with one or more races is 5,220,579 (1.7 percent) (U.S. Census Bureau 2011d). Among those in combination, a small percentage (7.3 percent) live in Indian Country (U.S. Census Bureau 2011b). Among AI/ANs alone, 34 percent live in Indian Country. Similarly, data presented for Blacks or African Americans and whites are for those who identified as a single race. Educational attainment is for those 25 years and older. Household participation in SNAP as reported by FNS administrative data was considerably higher in FY 2010 (18,618,436); SNAP participation is underreported in surveys.									
	^a U.S. Census Bureau 2011d; data from U.S. Census 2010.									
	^b U.S. Census Bureau 2011a; data from American Community Survey 1-Year Estimates 2010.									
	NA = not applicable.									

Figure 1. Characteristics among American Indians and Alaska Natives in the United States. Adopted from “Addressing Child Hunger and Obesity in Indian Country: Report to Congress,” by Gordon and Oddo 2012, p. 2.

		<p>12 oz. Frozen Any Brand 1/2 Gallon - 64 oz. Refrigerated Orange Juice Any Brand</p> <p>12 and 46-48 oz. Juices for Women Only 64 oz. Juices for Children Only (size as specified on food instrument)</p> <p>12 oz. 100% Old Orchard Frozen </p> <p>Apple, Apple Cherry, Apple Cranberry, Apple Kiwi Strawberry, Apple Passion Mango, Apple Raspberry, Apple Strawberry Banana, Berry Blend, Blueberry Pomegranate, Cherry Pomegranate, Cranberry, Cranberry Pomegranate, Cranberry Raspberry, Grape, White Grape, Orange, Pineapple, Pineapple Orange and Pineapple Orange Banana</p> <p>12 oz. 100% Dole Frozen </p> <p>Orange Peach Mango, Orange Strawberry Banana, Pineapple, Pineapple Orange, Pineapple Orange Banana and Pineapple Orange Strawberry</p> <p>Welch's Brighten Your Day Top Signifies 100% Juice 11.5 oz. 100% Welch's Frozen </p> <p>Grape, White Grape, White Grape Cranberry, White Grape Peach, White Grape Pear and White Grape Raspberry</p>	<p>Best Choice Apple, Blends (Berry, Cherry, Grape and Punch), Grape, Pineapple, Pink Grapefruit, Tomato, Vegetable, White Grape and White Grapefruit</p> <p>Great Value Apple, Cranberry, Cranberry Grape, Cranberry Raspberry, Grape, White Grape, White Grape Peach, Tomato and Vegetable </p> <p>Langers Apple, Apple Berry Cherry, Apple Cranberry, Apple Grape, Apple Kiwi Strawberry, Apple Orange Pineapple, Apple Peach Mango, Cranberry Berry Plus, Cranberry Grape Plus, Cranberry Plus, Cranberry Pomegranate Blueberry Plus, Cranberry Raspberry Plus, Disney (Apple Cran Grape, Berry, Grape, Punch), Grape, Grape Plus, Harvest Apple Plus, Orange, Pineapple, Pineapple Orange, Red Grape, Ruby Red Grapefruit, Tomato, Vegetable, Low Sodium Vegetable and White Grape </p> <p>Market Pantry Apple, Grape, White Grape, Tomato and Vegetable </p> <p>Old Orchard Acai Pomegranate, Apple, Apple Cranberry, Berry Blend, Blueberry Pomegranate, Cherry Pomegranate, Cranberry Pomegranate, Grape, Kiwi Strawberry, Orange, Peach Mango, Red Raspberry, White Grape and Wild Cherry </p> <p>Parade Apple, Grape, Orange, Orange Mango, Orange Pineapple, Pineapple, Pink Grapefruit, Tomato and Vegetable </p> <p>Shur Fine Apple, Cranberry, Cranberry Apple, Cranberry Raspberry, Grape, Juice A Lot (Berry, Cherry, Grape and Punch) White Grape, Orange, Pineapple, Pink Grapefruit, White Grapefruit, Tomato and Vegetable </p>	<p>Whole Grain Options</p> <p>16 oz. Loaves Only Best Choice - 100% Whole Wheat (UPC 0-70038-31150-8) Bimbo - 100% Whole Wheat (UPC 0-74323-09230-1) Cobblestone Mill - 100% Whole Wheat (UPC 0-72250-04171-3) Mrs. Baird's - 100% Whole Wheat (UPC 0-70870-00061-5) Mrs. Baird's - Sugar Free Whole Grain Wheat (UPC 0-70870-00067-7) Nature's Own - 100% Whole Grain Sugar Free (UPC 0-72250-01767-1) Nature's Own - 100% Whole Wheat w/Real Honey (UPC 0-72250-04319-9) Ozark Hearth - 100% Whole Wheat (UPC 0-75551-41191-9) Pepperidge Farm - Stone Ground 100% Whole Wheat (UPC 0-14100-07101-3) Pepperidge Farm - Very Thin Sliced 100% Whole Wheat (UPC 0-14100-07132-7) Roman Meal - Sungrain 100% Whole Wheat (UPC 0-77633-70030-0) Sara Lee - Classic 100% Whole Wheat (UPC 0-72945-61103-0) Sara Lee - Soft & Smooth 100% Whole Wheat w/Real Honey (UPC 0-72945-61175-7) Wonder - Soft 100% Whole Wheat (UPC 0-45000-12100-3)</p> <p>Additional Whole Grain Options (must have whole grain as primary ingredient by weight)</p> <p>Oatmeal - Any Brand 16 oz. or Less No Individual Packets</p> <p>Brown Rice - Any Brand 16 oz. or Less</p> <p>Bulgur - Any Brand 16 oz. or Less</p> <p>Whole Wheat Tortillas - Any Brand 16 oz. or Less</p> <p>Soft Corn Tortillas - Any Brand 16 oz. or Less</p>
<p>Cold Cereals Allowed 12 oz. to 36 oz. size only</p> <p>Hot Cereals Allowed 11.8 oz. to 36 oz. size only</p> <p>No Substitutions!</p>		<p>64 oz. 100% Juice Bottles - Unsweetened</p> <p>Vitamin C Juice Requirements</p> <p>Non 100% Citrus Juices - Minimum of 120% Vitamin C Fortified</p> <p>100% Citrus Juices - Minimum of 100% Vitamin C Fortified</p> <p>Tomato and Vegetable Allowed in 46-48 oz. & 64 oz.</p> <p>Juicy Juice All Flavors Diane's Garden Vegetable Tipton Grove Apple and Grape</p>		

Figure 2. WIC Approved Foods. Adopted from Food and Nutrition Service online at <http://www.ok.gov/health2/documents/WIC%20Food%20Card%202013.pdf>

Household Size	Gross monthly income** (103 percent of poverty)	Net monthly income*** (100 percent of poverty)
1	\$1,211	\$931
2	\$1,640	\$1,261
3	\$2,069	\$1,591
4	\$2,498	\$1,921
5	\$2,927	\$2,251
6	\$3,356	\$2,581
7	\$3,785	\$2,911
8	\$4,214	\$3,241
Each additional member	+\$429	+\$330

Note. Adopted from Food and Nutrition Service

*For the time period Oct. 1, 2012 through Sept. 30, 2013.

**Gross income means a household's total, non-excluded income, before any deductions have been made.

***Net income means gross income minus allowable deductions.

Household Size	Maximum Monthly Allotments
1	\$200
2	\$367
3	\$526
4	\$668
5	\$793
6	\$952
7	\$1,052
8	\$1,202
Each additional member	\$150

Note. Adopted from Food and Nutrition Service

*For the time period Oct. 1, 2012 through Sept. 30, 2013.

USDA FOODS AVAILABLE FOR 2012*						
Food Distribution Program on Indian Reservations (FDPIR)						
WBSCM Code	Product	Pack Size	WBSCM Code	Product	Pack Size	
GROUP (A)						
VEGETABLES**			JUICE			
110020	Beans Black Can - 24/300	24/15.5 oz cans	100893	Apple Juice Plst Btl - 8/64 fl oz		8/64 oz bottle
100306	Beans Green Can - 24/300	24/15.5 oz cans	100899	Cranberry Apple Juice Plst Btl - 8/64 fl oz		8/64 oz bottle
100372	Beans Light Red Kidney Can - 24/300	24/15.5 oz cans	100895	Grape Concord Juice Plst Btl - 8/64 fl oz		8/64 oz bottle
110021	Beans Pinto Can - 24/300	24/15.5 oz cans	100896	Grapefruit Juice Plst Btl - 8.64 fl oz		8/64 oz bottle
100361	Beans Refried Can - 24/300	24/15.5 oz cans	100897	Orange Juice Plst Btl - 8/64 fl oz		8/64 oz bottle
100363	Beans Vegetarian Can - 24/300	24/15.5 oz cans	100898	Tomato Juice Plst Btl - 8/64 fl oz		8/64 oz bottle
100308	Carrots Can - 24/300	24/15.5 oz cans				
100310	Corn Cream Style Can - 24/300	24/15.5 oz cans	FRUITS			
100311	Corn Whole Kernel Can - 24/300	24/15.5 oz cans	100207	Applesauce Can - 24/300		24/15.5 oz cans
100904	Hominy Can - 24/300	24/15.5 oz cans	100210	Apricot Halves Can - 24/30		24/15.5 oz cans
100314	Peas Can - 24/300	24/15.5 oz cans	100211	Mixed Fruit Can - 24/300		24/15.5 oz cans
100337	Potatoes Dehydrated Flks Pkg - 12/1 lb	12/1 lb packages	100213	Cranberry Sauce Can-24/300***		24/15.5 oz cans
100331	Potatoes Wht Slices Can - 24/300	24/15.5 oz cans	100218	Peaches Cling Slices Can - 24/300		24/15.5 oz cans
100319	Pumpkin Can - 24/300	24/15.5 oz cans	100223	Pears Can - 2/4300		24/15.5 oz cans
100322	Soup Tomato Can - 24/1	24/10.5 cans	100290	Plums Pitted Dried Pkg - 24/1 lb		24/1# pkg
100321	Soup Vegetable Can - 24/1	24/10.5 cans	100295	Raisins Pkg - 24/15 oz		24/15 oz pkg
110163	Soup Crm of Chicken RDU Sod Ctn-12/22 oz	12/22 oz cartons	MEATS			
110164	Soup crm of Mushrm RDU Sod Ctn-12/22 oz	12/22 oz cartons	100127	Beef Can - 24/24 oz		24/24 oz cans
100335	Spaghetti Sauce Meatless Can - 24/300	24/15.5 oz cans	100159	Beef Fine Ground Frz Pkg - 40/1 lb		40/1 lb packages
100323	Spinach Can - 24/300	24/15.5 oz cans	100166	Beef Roast Round Frz Ctn - 38-42 lb		20/2# carton
100316	Sweet Potatoes Can - 24/300	24/15.5 oz cans	100526	Beef Stew Can - 24/24 oz		24/24 oz cans
100328	Tomato Diced Can - 24/300	24/15.5 oz cans	100094	Chicken Boned Can - 48/12.5 oz		48/12.5 oz cans
100333	Tomato Sauce Can - 24/300	24/15.5 oz cans	110154	Chicken Consumer Split Breast Pkg-6/5 lb		6/5# packages
100320	Veg Mix Can - 24/300	24/15.5 oz cans	100880	Chicken Whole Bagged Frz Ctn-36-43 lb		10/4# packages
DRY BEANS			SPECIALTY ITEMS (Subject to available funds)			
100380	Beans Great Northern Dry Pkg - 12/2 lb	12/2 lb packages	100182	Pork Ham Waterad Frz Ctn - 12/3 lb***		12/3 lb carton
100382	Beans Pinto Dry Pkg - 12/2 lb	12/2 lb packages				
MISCELLANEOUS						
100044	Egg Mix Dried Pkg - 48/6 oz	48/6 oz packages				

Figure 3. USDA Foods available for Food Distribution on Indian Reservations (FDPIR) participants. Adopted from Food and Nutrition Service online at <http://www.fns.usda.gov/fdd/foods/fy12-FDPIRfoods.pdf>.

USDA FOODS AVAILABLE FOR 2012*					
Food Distribution Program on Indian Reservations (FDPIR)					
WBSCM Code	Product	Pack Size	WBSCM Code	Product	Pack Size
<i>GROUP (B)</i>					
110198	Cheese Bld Amer Skm yel Reg slc Lvs-6/5lb	6/5 lb package	100050	Milk 1% Milkfat UHT 1500 Box - 12/32 fl oz	12/32 oz packages
110199	Cheese Process Reg Lvs-6/5 lb	6/5 lb loaves	100440	Oil Vegetable Btl - 8/48 oz	8/48 oz bottles
100471	Corn meal Degermed Yellow Bag - 8/5 lb	8/5 lb bag			
100910	Crackers Unsalted Box - 12/16 oz	12/16 oz box			
100433	Egg Noodle 1/2 Inch Wide Pkg - 12/1 lb	12/1 lb packages		Ready-To Eat Cereals	
100921	Buttery Spread Light Tubs-12/15 OZ	12/15 oz tubs	100530	CEREAL CORN FLKS -SUBST	Packaging varies per vendor
110162	Milk Skim Evaporated Can-24/12 fl oz	24/12 fl oz cans	100749	CEREAL RICE CRISP -SUBST	Packaging varies per vendor
100473	Farina Wheat Pkg - 24/14 oz	24/14 oz package	100750	CEREAL OAT CIRCLES -SUBST	Packaging varies per vendor
100400	Flour All Purp Enrch Blch Bag - 8/5 lb	8/5 lb bag	101009	CEREAL RTE CORN SQUARES-SUBST	Packaging varies per vendor
100918	Bakery Flour Mix Lowfat Bag - 6/5 lb	6/5 lb bag	101010	CEREAL RTE CORN AND RICE BISCUITS-SUBST	Packaging varies per vendor
100410	Flour Whole Wheat Bag - 8/5 lb	8/5 lb bag	100933	CEREAL WT BRAN FLKS 1344 PKG-14/17.3OZ	14/17.3 oz boxes
100065	Milk Instant NDM Pkg - 12/25.6 oz	12/25.6 oz			
100428	Pasta Macaroni Plain Elbow Pkg - 24/1 lb	24/1 lb packages			
101024	Macaroni & Cheese 1404 Pkg - 48/7.25 oz	48/7.25 oz pkg			
100465	Oats Rolled Tube - 12/42 oz	12/42 oz tube			
100395	Peanut Butter Smooth Jar - 12/18 oz	12/18 oz jars			
100391	Peanuts Roasted Reg Unsl Pkg - 12/16 oz	12/16 oz package			
100492	Rice US#2 Long Grain Pkg - 30/2 lb	30/2 lb packages			
100435	Whole Grain Pasta Rotini Mac Pkg - 24/1 lb	20/1 lb packages			
100426	Pasta Spaghetti Pkg - 12/2 lb	12/2 lb packages			
<i>*Purchases are subject to market conditions. This list does not include bonus commodities.</i>					
<i>** All canned vegetables are low-sodium (140 milligrams of sodium or less per serving).</i>					
<i>*** Seasonal items -- October - December only</i>					

Figure 3 (cont.). USDA Foods available for Food Distribution on Indian Reservations (FDPIR) participants. Adopted from Food and Nutrition Service online at <http://www.fns.usda.gov/fdd/foods/fy12-FDPIRfoods.pdf>

CHAPTER III

METHODS AND PROCEDURES

Food Insecurity Conceptual Framework

The conceptual framework for this research, including the socioeconomic factors such as education, employment, and geographical location that contribute to poverty, and then ultimately to food insecurity, is illustrated in Figure 4. These socioeconomic factors have been researched by many and found to be contributors in poverty stricken groups such as American Indians (Coleman-Jensen et al. 2012; Finegold et al. 2009; Companion 2008; Gordon and Oddo 2012; Gundersen 2007; Gundersen, Kreider, and Pepper 2011; Ratcliffe, McKernan, and Zhang 2011). As Cook and Jeng (2009, p. 6) stated, “poverty is the main cause of food insecurity and hunger”. Therefore, these same socioeconomic factors that contribute to poverty potentially lead to the high number of food insecure American Indian households.

Hypotheses

Hypothesis 1: American Indian households with less education, higher unemployment, and lower levels of income are more likely to be food insecure. As Andrew and Nord (2009) found, the recent recession has increased unemployment and has caused an increase in the total number of American households that were considered food insecure. Studies have indicated that employment status, income level, and

other socioeconomic factors contribute to food insecurity and poor health outcomes for American Indians (Andrew and Nord 2009; Nord, Andrew, and Carlson 2008; Story et al. 1999). Additionally, if these socioeconomic factors are the same factors that contribute to poverty (Cook and Jeng 2009), then food insecurity is also affected by these.

Hypothesis 2: Households with children are more likely to be classified as food insecure than households without children. Research has found that households with children are more likely to be food insecure than their counterparts (Nord, Andrew, and Carlson 2008).

Hypothesis 3: A higher number of CPN households that are classified as food insecure participate in SNAP than FDPIR. SNAP is the largest commonly known and recognized food assistance program (Ratcliffe, McKernan, and Zhang 2011; Oliveira 2012; U.S. Department of Agriculture 2013).

Hypothesis 4: Characteristics that influence participation in one food assistance program does not necessarily influence participation in other food assistance programs. Different levels of knowledge about the programs and different eligibility requirements are the rationale behind this assumption.

Survey

Prior to administrating the survey, approval was obtained from University Research Services and the Institutional Review Board (IRB) at Oklahoma State University. This study was reviewed by IRB and approved on November 27, 2012. A modification was made after hosting a focus group and approved by IRB on January 8, 2013. The application number assigned to this research was AG-12-58 (see Appendix B and Appendix D).

The CPN was contacted to schedule a face-to-face appointment in order to gain approval and access to survey the tribe. Once given permission from tribal administrators (see Appendix C for the written consent letter from tribal leader), a focus group was set up with the tribe to gain more insight into pertinent questions that needed to be addressed between the two parties. The focus group was valuable in establishing questions that were added to the survey and more provided more insight into tribal health and nutrition issues. The CPN administration only provided a list of tribal members' addresses that live within the three Shawnee zip codes. By using the random number generator in EXCEL, 200 households were randomly selected for this study. Via the request from tribal leaders and directors, a pre-survey letter was sent to only the selected households before the survey was conducted (see Appendix E). The purpose of this letter was to inform the households that an investigator would be knocking on their doors to participate in a survey. Safety for both CPN households and the researcher was taken seriously.

The instrumentation used in this study was an interviewer-administered survey which had two components. First, it consisted of the Core Food Security Model (CFSM) which is used in the Current Population Survey (CPS) for many decades. Secondly, a self-issued survey that specifically addressed household characteristics and the utilization of food assistance programs was administered.

The Core Food Security Module (CFSM) was developed by the United States Department of Agriculture (USDA) to measure food insecurity in the United States for many decades now. According to Nord and Hopwood (2007), this survey has "excellent internal validity." Currently, the survey has been narrowed down to 18 official questions that measure food insecurity (Gundersen 2007). The first 10 questions consist of the U.S. Adult Food Security Scale and questions 11-18 consist of the U.S. Children Food Security Scale. Both of these combined are considered the U.S. Household Food Security Scale. If a household has children present, then all 18 questions would be asked. If the household did not have children present, then

only the first 10 questions would be asked to the respondent. For a complete list of questions in the CFMS, please see Appendix A.

The self-issued portion of this survey asked questions related to household characteristics and the utilization of food assistance programs designed to address the underlying problems or factors that contribute to food insecurity. For example, questions included “what is the highest level of education you have completed”, “what was the main reason for not continuing your education”, “do your children participate in a school lunch or breakfast assistance program”, “are you currently employed”, “what is the main reason for being unemployed”, “what is your total household income level”, and “which governmental or tribal food assistance program(s) does your household participate in”. The list of all survey questions is provided in Appendix F.

The survey was administered in January and February 2013. CPN households were visited on Friday evenings between 5 and 9 p.m., Saturdays from 10 a.m. to 9 p.m., Sundays from 12 p.m. to 8 p.m., and on Monday evenings from 5 p.m. to 9 p.m. This time frame was set forth by the focus group and researcher to best reach families when present at their residents. The survey was conducted only if a head of household was answering the questions and only if the respondent wished to voluntarily participate in the research.

Citizen Potawatomi Nation Classification

It is important to understand several things in this study because American Indian tribes have different requirements for enrollment and benefit purposes. For a member to be affiliated with the CPN, they must have an ancestor on either the Bureau of Indian Affairs Census Rolls of 1937 or 1887. Therefore, the households visited in this research had at least one member of the CPN tribe.

Classification of Food Security Levels

When examining the questions asked in the CFSSM, they are designed to intensify in severity for households with and without children. As Gundersen et al. (2011, p. 283) alluded to; the questions are “qualified by the proviso that the conditions are due to financial constraints.” To determine the household’s food security level the number of affirmative responses are added and make up its raw score. Answers that consist of “yes”, “often true”, “sometimes true”, “almost every month”, and “some months but not every month” are all classified and coded as affirmative responses. Using the food security status levels that Bickel et al. (2000) established, households were classified into four general categories (food secure, food insecure without hunger, food insecure with moderate hunger, and food insecure with severe hunger). For households with children, the following thresholds have been established: (a) food secure (households that have a raw score of 0-2), (b) food insecure without hunger (households that have a raw score 3-7), (c) food insecure with hunger, moderate (households that have a raw score 8-12), and (d) food insecure with hunger, severe (households that have a raw score 13-18). For households without children, the following thresholds have been established: (e) food secure (households that have a raw score of 0-2), (f) food insecure without hunger (households that have a raw score 3-5), (g) food insecure with hunger, moderate (households that have a raw score 6-8), and (h) food insecure with hunger, severe (households that have a raw score 9-10). Households that have been classified as either (a) or (e) can be further classified as food secure and households that are classified as either (b), (c), (d), (f), (g) or (h) can be further classified as food insecure.

It is important to note that the household categories were updated in 2006 to “high food security”, “marginal food security”, “low food security”, and “very low food security”. For households with children, the following thresholds were established: (i) high food security (households that have a raw score of 0), (j) marginal food security (households that have a raw score 1-2), (k) low food security (households that have a raw score 3-7), and (l) very low food

security (households that have a raw score 8-18). Households that have been classified as either (i) or (j) can be further classified as food insecure and households that are classified as either (k) or (l) can be further classified as food insecure. For households without children the following thresholds have been established: (m) high food security (households that have a raw score of 0), (n) marginal food security (households that have a raw score 1-2), (o) low food security (households that have a raw score 3-5), and (p) very low food security (households that have a raw score 5-10). Households that have been classified as either (m) or (n) can be further classified as food secure and households that are classified as either (o) or (p) can be further classified as food insecure.

Even with the new terminology, the number of affirmative responses changed slightly. From the old label to the new label, food secure households were broken down into “high food security” and “marginal food security” and the three different labels for food insecure households were lumped into “low food security” and “very low food security”. See Table 4 for further explanation. For this study, the old terminology was used. As Gundersen et al. (2011) pointed out, the questions intensify in severity.

Within the CFSSM, a household with children responding affirmatively to three or more questions is deemed food insecure and a household responding affirmatively to eight or more questions is deemed food insecure with hunger. As an example, consider two households, one responding affirmatively to 8 questions and one responding affirmatively to 18 questions. Both are treated as food insecure with hunger; yet, arguably, the latter household has a higher level of food insecurity. (Gundersen 2007, p. 192)

After running specific analysis on the four categories of food security levels (food secure, food insecure without hunger, food insecure with moderate hunger, and food insecure with severe

hunger), the categories were then summarized as either food secure or food insecure for modeling purposes.

Modeling Framework (Regression and Logit Models)

Since there were no missing values in the completed surveys, specifically the CFMS, data analysis was simple and straightforward (Bickel et al. 2000). Inputting the 91 completed surveys into STATA, a data analysis and statistical software program, allowed for analysis to be conducted on the households visited. Three socioeconomic factors (educational attainment, employment status, and household income level) were quantitatively measured to find which factor had the strongest correlation with food insecurity among the CPN households.

In terms of the regression framework, there are two different dependent variables that were used to determine the affects of food insecurity. These dependent variables included adult food security score (*adultfs_score*) and children food security score (*childrenfs_score*). The *adultfs_score* ranges from 0-10 (0 being food secure and 10 being food insecure with severe hunger) and the *childrenfs_score* ranges from 0-8 (0 being food secure and 8 being food insecure with severe hunger). Because of the continuous nature of these dependent variables, ordinary least squares (OLS) modeling was employed to see how selected independent variables affected the household food security status within each of the dependent variables. Similar to Brooks and Whitacre (2011), the basic OLS model is as followed:

$$y_i = X_i\beta + Z_i\delta + W_i\gamma + \varepsilon_i \quad (1)$$

where y_i depicts the dependent variables adult food security score or children food security score for household i , X_i is a vector of household education levels, Z_i is a vector of household income levels, W_i is a vector of household employment; β , δ , and γ are the respective associated parameter vectors, and ε is the associated error term. Vectors X_i , Z_i , and W_i all possibly affect y_i . For example, in Model (1) in Table 6, y represents adult food security score, which is tested

against characteristics of different levels of education completed (X). In this model, it was predicted that as the level of education increases, the adult food security should decrease. Furthermore, it was predicted that as education and income increase, along with being employed, the food security score would decrease.

In terms of the logistic regression framework, there are eight different dependent variables that were used to determine the affects of different food security statuses and participation in different food assistance programs. These dependent variables included: food insecure households without hunger, food insecure households with hunger at both moderate and severe categories combined, all food insecure households, and households that participate in SNAP, FDPIR, WIC, Title 6 (Elderly), and National School Lunch food assistance programs. Because of the restricted outcomes of the dependent variables of 1 or 0, a logistic regression model was used. Using a model similar to Whitacre (2007) and equation (1), the basic logistic regression model is as followed:

$$y_i^* = X_i\beta + Z_i\delta + W_i\gamma + \varepsilon_i$$

$$y_i = 1 \text{ if } y_i^* \geq 0$$

$$y_i = 0 \text{ if } y_i^* < 0$$

where y_i^* is an unobservable measure of the consequences of varies household characteristics on food security or cost and benefits for participating in different food assistance programs for household i , y_i is the actual observation of households that were classified in the specific categories observed (food insecure households without hunger, food insecure households with hunger at both moderate and severe categories combined, all food insecure households, and households that participate in SNAP, FDPIR, WIC, Title 6 (Elderly), and National School Lunch food assistance programs), X_i is a vector of household education levels, Z_i is a vector of

household income levels, W_i is a vector of household employment; β , δ , and γ are the respective associated parameter vectors; and ε_i is the statistical model's error term. The logistic regression uses the functional form $Prob(Y = 1) = \frac{e^{XB}}{1+e^{XB}}$, where $e^{XB} = X_i\beta + Z_i\delta + W_i\gamma + \varepsilon_i$, which ensures that the probability falls between 0 and 1. For example, in Model (5) in Table 8, y_i^* represents the consequences of varies household characteristics on food security, y_i is the actual observation of households that are classified as food insecure (without hunger and with hunger at both levels), X_i is three different levels of education using high school no diploma as the baseline, Z_i is four different levels of total household income using less than \$10,000 as the baseline, and W_i is two different levels of employment status using employed as the baseline. It was hypothesized that households with higher levels of education and income, along with being employed, would be less likely to be food insecure. In general, education and income variables were expected to be negative while the employment variables (unemployed and retired) were expected to be positive when addressing food insecure households (at any level). When examining households who participate in food assistance programs, negative signs were expected for education and income and positive signs were expected for the employment variables.

Basic Descriptive Statistics of Data

When examining basic statistics of the CFMS portion of the survey and guidelines set out by USDA, we discovered differences within the households. Out of the 91 households that completed the survey, 43% had a child or children under the age of eighteen living in the home. Applying the U.S. Adult Food Security Scale revealed that 53.85% of households without children were classified as having “high food security”, 15.38% as “marginal food security”, 18.68% as “low food security”, and 10.09% as having “very low food security” (see Figure 5). Applying the U.S. Children Food Security Scale revealed that 90.11% of households with children were classified as having “high or marginal food security”, 6.59% as “low food

security”, and 3.30% as having “very low food security” (see Figure 6). Furthermore, the U.S. Household Food Security Scale which, considers households with and without children, indicated that 53.85% of households surveyed displayed “high food security”, 10.99% “marginal food security”, 24.18% “low food security”, and 10.99% “very low food security” (see Figure 7). However, for this research, 64.84% of households were considered “food secure”, 24.18% were “food insecure without hunger”, 4.40% were “food insecure with hunger, moderate”, and 6.59% were considered “food insecure with hunger, severe” (see Figure 8). Notice that Figures 7 and 8 are very similar. Combining “food insecure without hunger”, “food insecure with hunger, moderate”, and “food insecure with hunger, severe” into a single category of food insecure reveals that 35.17% of households were food insecure at some time during the past twelve months. Similar to the Gundersen (2008) study, we wanted to evaluate the “percent of households responding affirmatively to each of the possible number of affirmative responses” (p. 198) in our study. Results indicated that for each of the possible number of affirmative responses, with the exception of the last question (18), a much higher percentage than in Gundersen’s study (Figure 9). Households were more likely to answer affirmative to 6 questions than 5 questions. As shown in Figure 10, the different employment statuses with regards to answering affirmative to each of the possible number of affirmative responses was also examined. Results indicated that unemployed households were more likely to answer affirmative to all possible number of affirmative responses, with the exception of the last question, than the other two groups. In both Figures 9 and 10, the increase from 10 affirmative responses to 11, is the transition from the U.S. Adult Food Security Score to the U.S. Children Food Security Score. This figure is expected to rise as a result of the movement from the adult to child security score.

Additionally, differences between households were also identified when examining the self-issued portion of the survey which addressed household characteristics. When looking at the level of education completed by the respondent, 15.38% attended high school, but did not receive

a diploma, 34.07% obtained a high school diploma, 35.16% had completed some college, 10.99% obtained a college degree, and only 3.30% obtained a graduate or professional degree (Figure 11). When asked about the main reason(s) for not continuing with their education, the three main reasons were financial difficulties, found employment, and pregnant or tending to children. Out of the 54% of the households that were unemployed (Figure 12), 42% of the households stated that they were unemployed because they were retired and 35% were unemployed because of health reasons or they were disabled. Therefore, we separated these groups and found that 45% of the households were employed, 31% were unemployed, and 24% were retired. When examining total household income (Figure 13), we found a wide range of responses. Therefore, income levels were combined into five categories to find that 13.19% of households make less than \$10,000; 18.68% make \$10,000-\$19,999; 16.48% make \$20,000-\$39,999; 20.88% make \$40,000-74,999; and 15.38% make \$75,000 or more. In comparison to the Census 2009 data shown for American Indians/Alaska Natives only, the CPN educational attainment and income levels are strikingly different (Figure 5). When examining participation in food assistance programs, 22 households with children participate in a school-based food assistance program, with 51% participating in the National School Lunch Program and 32% participating in the School Breakfast Program (Figure 14). Additionally, out of the 53 households that participate in a household-based food assistance program, 38% of households participate in SNAP, 26% in FDPIR, 19% in Title 6 (Elder Nutrition Program), and 14% in WIC (Figure 15).

Finally, after examining four different categories (levels of education, income, employment status, and food assistance participation) in the four different food security levels, we find noteworthy information (Table 6). For example, in the household food secure category, only 8.47% had an education level of high school but no diploma, whereas, 38.98% had obtained their high school diploma, 28.81% had attended some college, and 22.03% had a college degree or higher. Not surprisingly, if the household had a college degree or makes \$75,000 or more in

total income, they were not food insecure. However, it was surprising that 66.67% of the food insecure households with severe hunger had attended some college and 50% had a total household income level of \$10,000 to \$19,999. One possible explanation for this is that households that have less than a college degree and make less than \$10,000 are dependent or rely on outside sources of welfare to survive. Employed households were not classified as food insecure with hunger, severe and retired households were not classified as either of the food insecure with hunger groups. All (100%) food insecure with hunger, severe households were unemployed. In addition, households that participate in either Title 6 or WIC were classified as either food secure or food insecure without hunger. Additionally, Table 6 shows that Hypothesis 3 was a sound prediction in that a higher percentage of households that are classified as food insecure participate in SNAP than FDPIR. Notice, however, the category food insecure with moderate hunger consisted of both 25% SNAP and FDPIR participation. Lastly, 83.3% of households that were classified as food insecure with hunger, severe were unemployed because of health reasons or because they were disabled, and 16.67% were unemployed because they were tending to family matter.

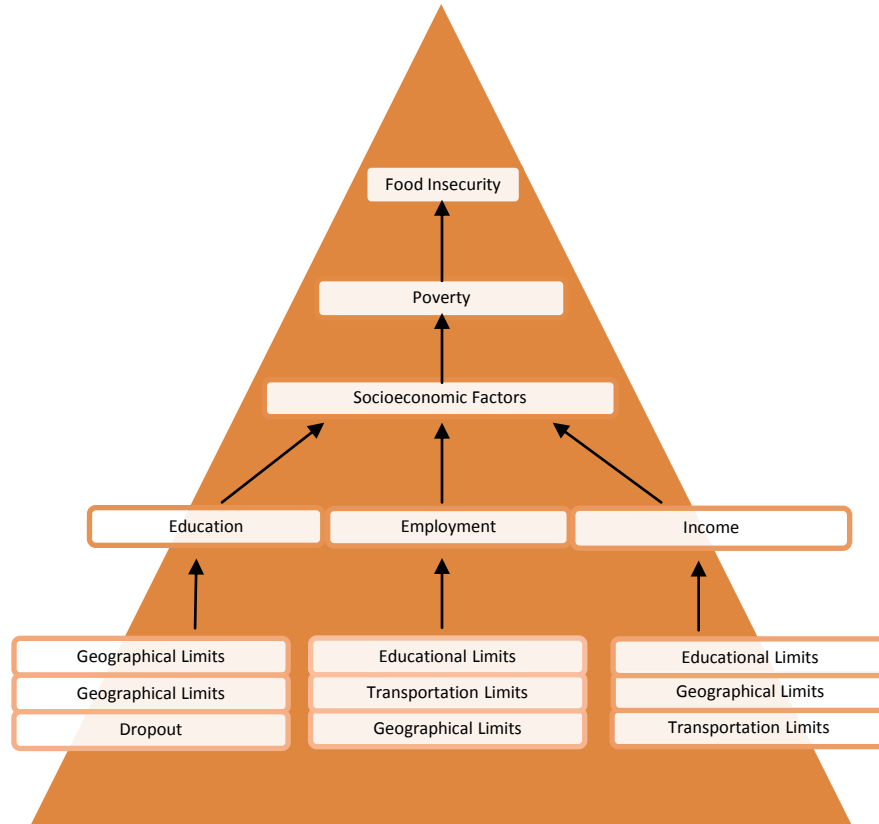


Figure 4. Food Insecurity Conceptual Framework.

Table 4. Household Food Security Scale and Classification.				
General Category	Number of Affirmative Responses:	Number of Affirmative Responses:	Old Category	New Category
	(Out of 18) Households With Children	(Out of 10) Households Without Children		
Food Secure	0	0	Food Secure	High Food Security
	1-2	1-2		Marginal Food Security
Food Insecure	3-7	3-5	Food Insecure Without Hunger	Low Food Security
	8-12	6-8	Food Insecure With Hunger, Moderate	Very Low Food Security
	13-18	9-10	Food Insecure With Hunger, Severe	

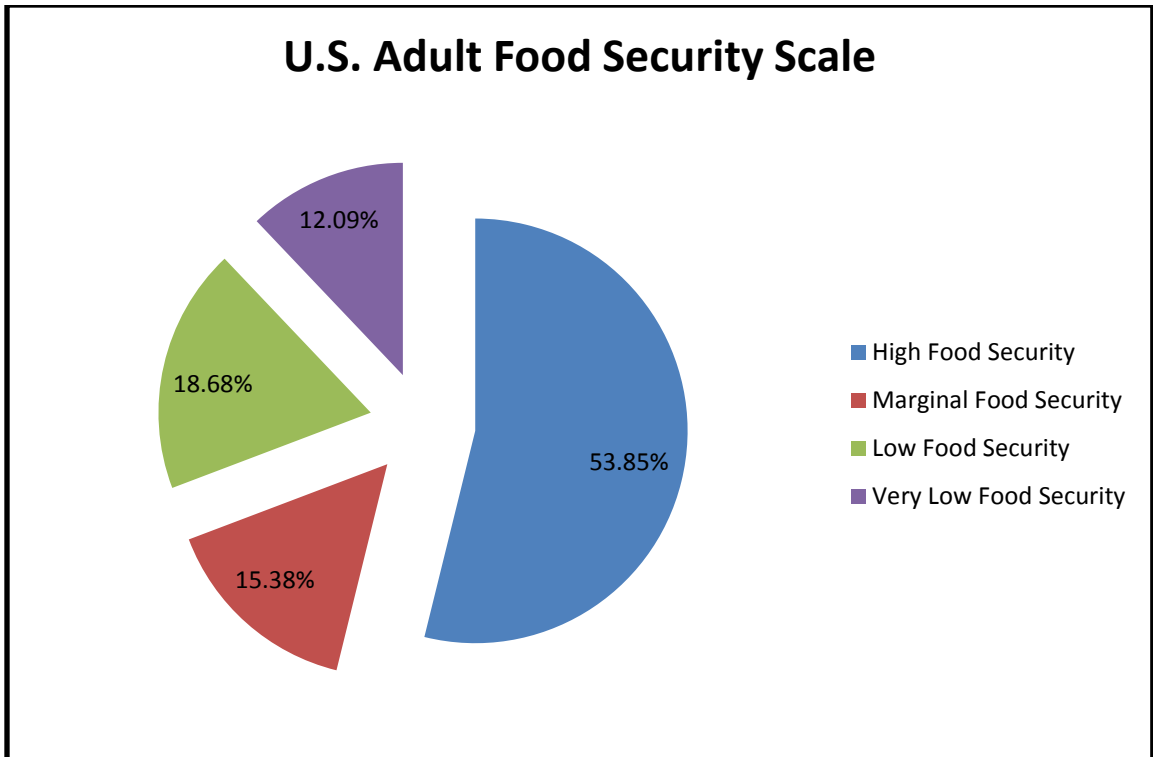


Figure 5. U.S. Adult Food Security Scale classification for Citizen Potawatomi Nation households in Shawnee, Oklahoma, 2013.

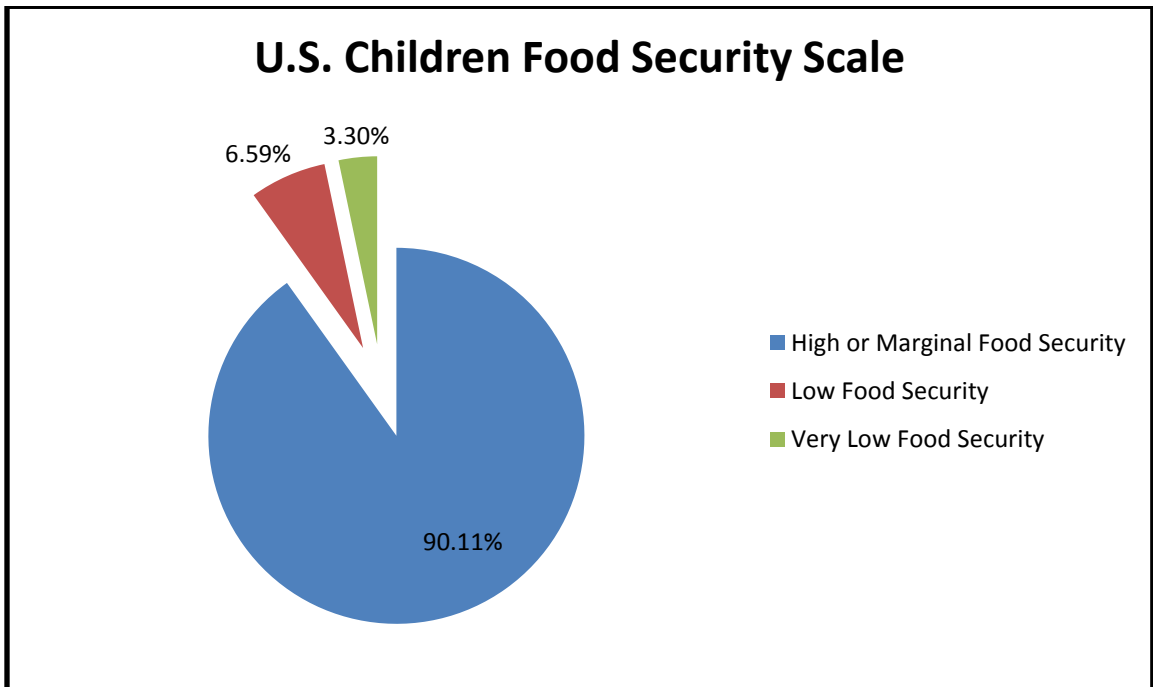


Figure 6. U.S. Children Food Security Scale classification for Citizen Potawatomi Nation households in Shawnee, Oklahoma, 2013.

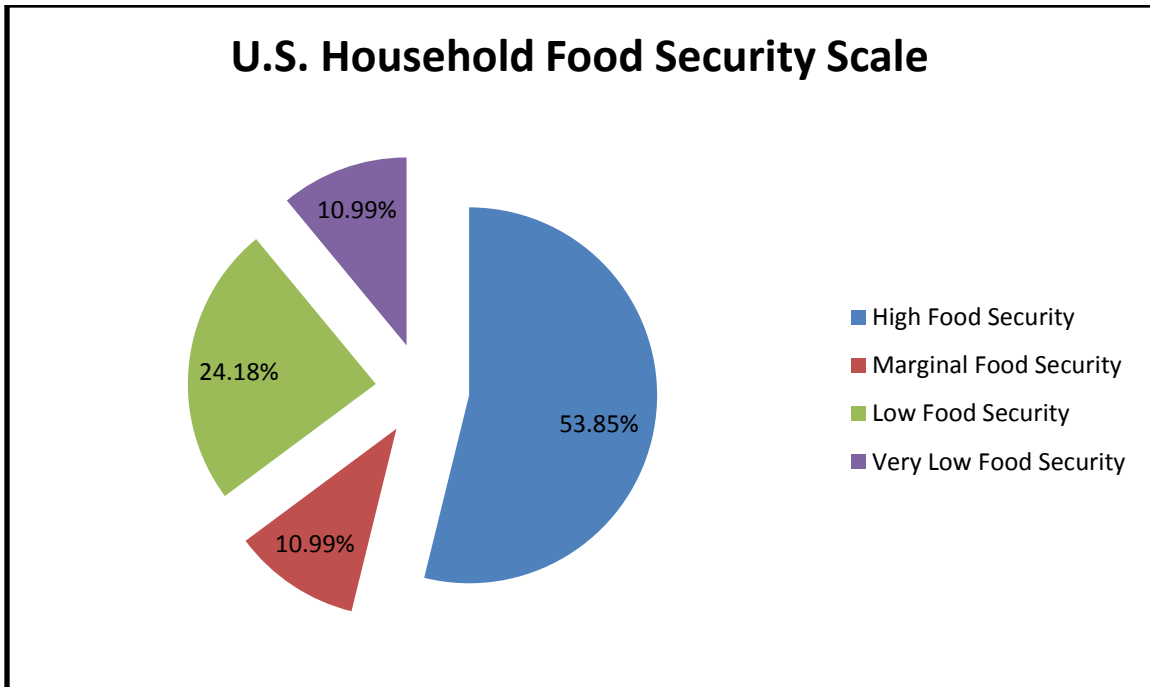


Figure 7. U.S. Household Food Security Scale (most-recent) classification for Citizen Potawatomi Nation households in Shawnee, Oklahoma, 2013.

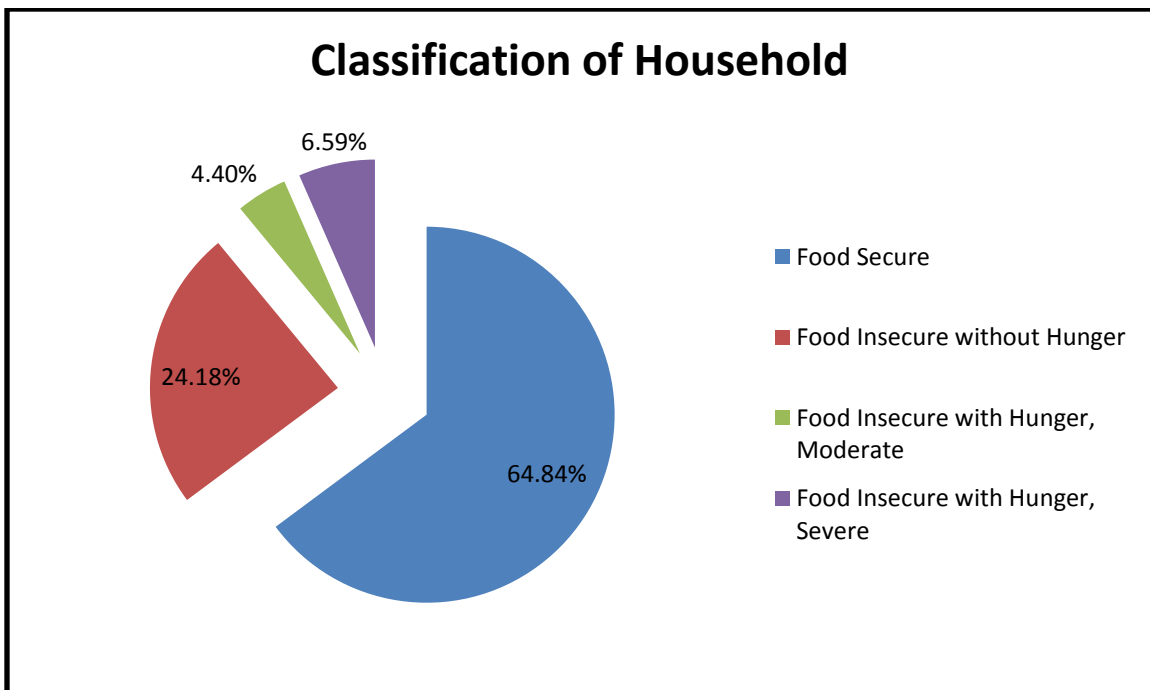


Figure 8. U.S. Household Food Security Scale (older-version) classification for Citizen Potawatomi Nation households in Shawnee, Oklahoma, 2013.

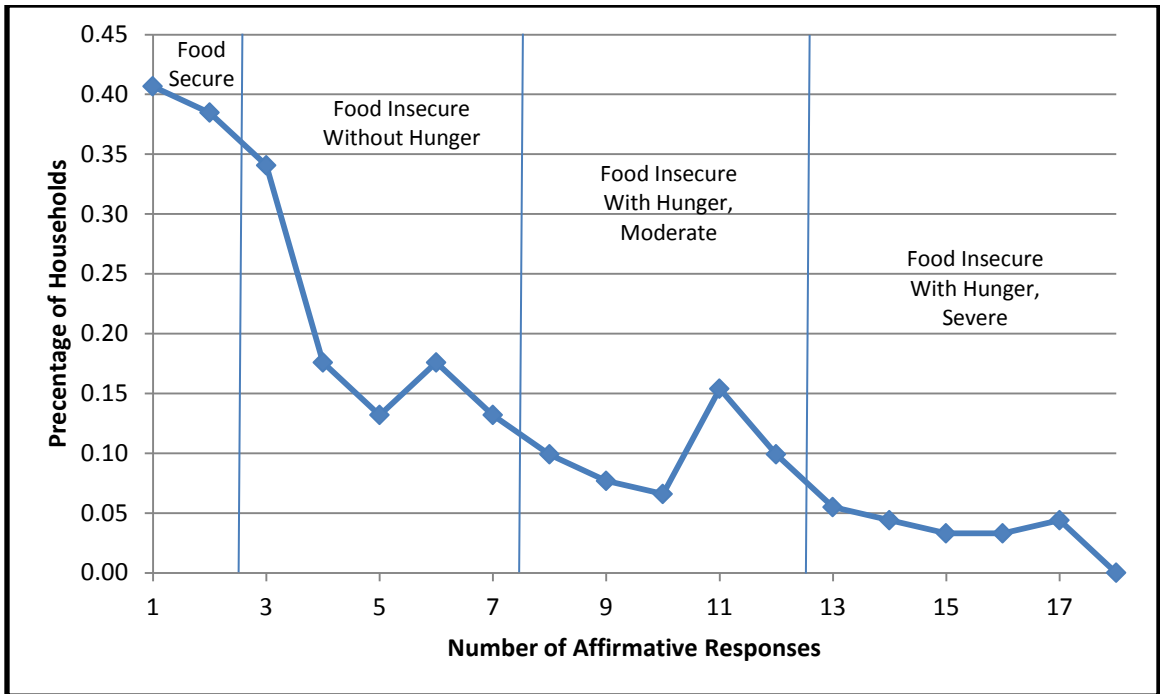


Figure 9. Food insecurity responses by Citizen Potawatomi Nation households with children in Shawnee, Oklahoma, 2013.

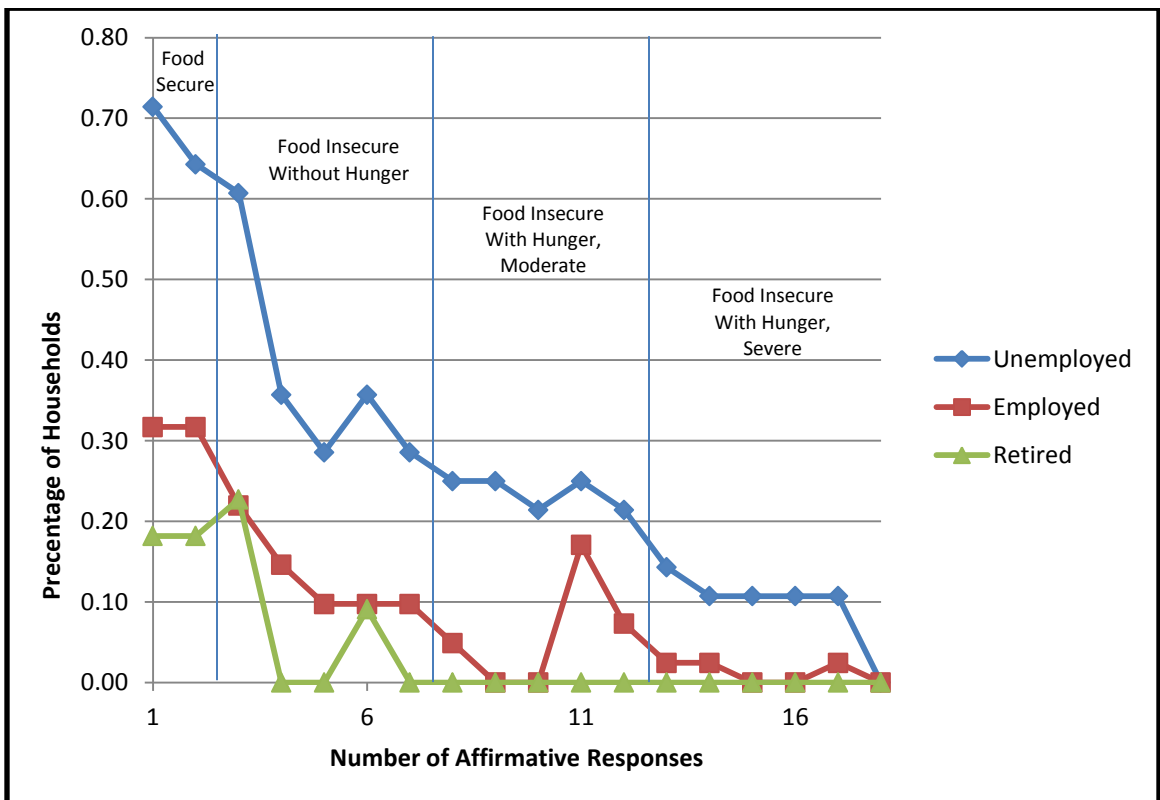


Figure 10. Food insecurity responses by Citizen Potawatomi Nation households with children at different employment levels in Shawnee, Oklahoma, 2013.

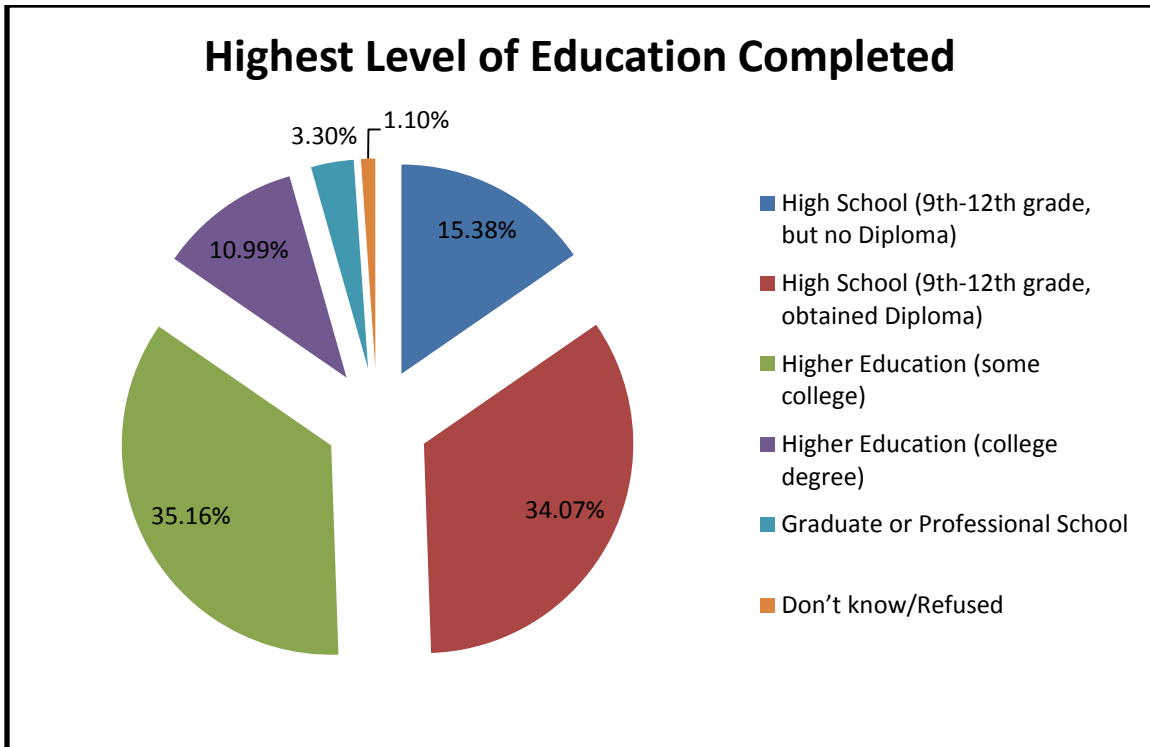


Figure 11. Levels of education for Citizen Potawatomi Nation households in Shawnee, Oklahoma, 2013.

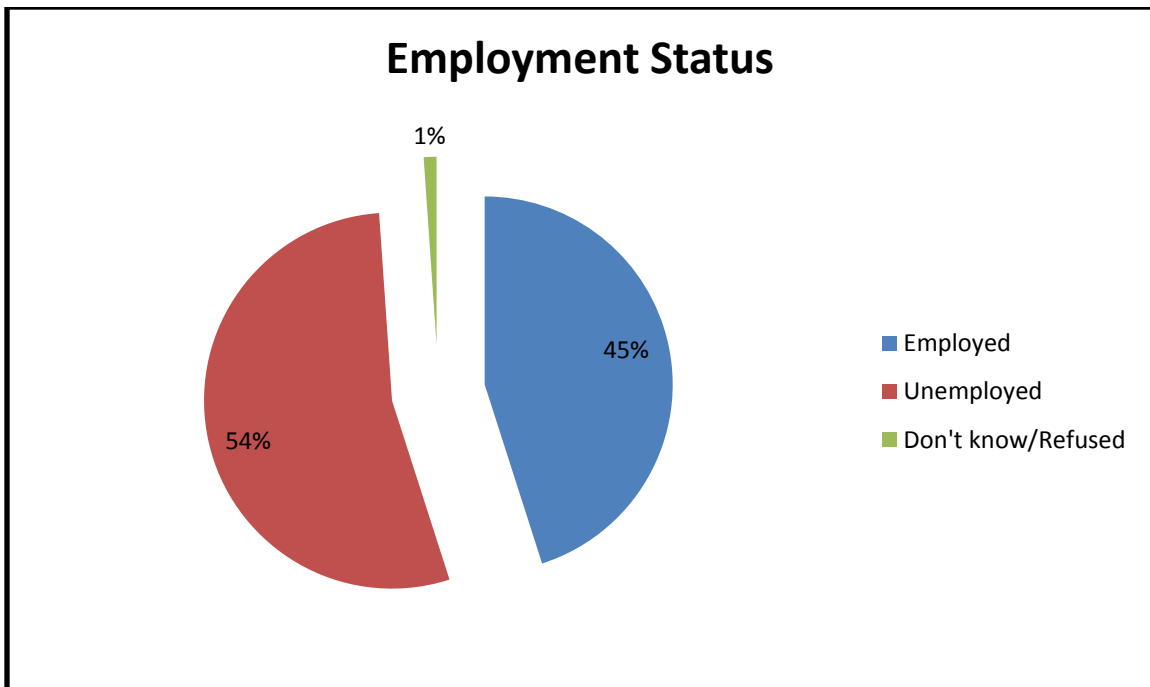


Figure 12. Employment status for Citizen Potawatomi Nation households in Shawnee, Oklahoma, 2013.

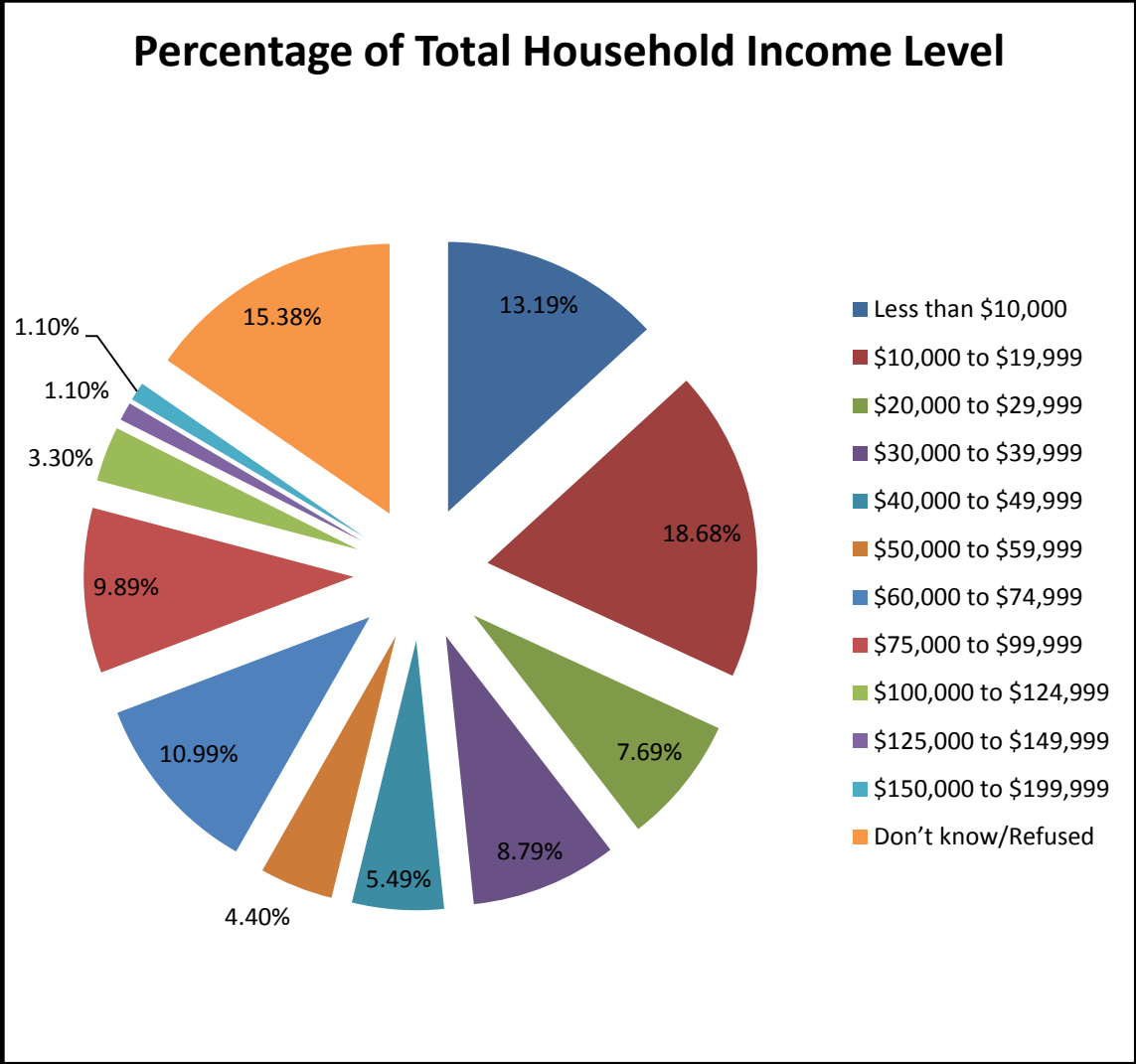


Figure 13. Percentage of total household income levels for Citizen Potawatomi Nation households in Shawnee, Oklahoma, 2013.

Table 5. Differences between national averages and the Citizen Potawatomi Nation		
	Census 2009 Data*	CPN 2012-2013
Education		
High School, no diploma	13.78	15.38
High School, diploma	30.46	34.07
Some College	25.64	35.16
College Degree or higher	20.33	14.29
Income		
Less than \$10,000	11.44	13.19
\$10,000 to \$19,999	12.73	18.68
\$20,000 to \$39,999	25.28	16.48
\$40,000 to \$74,999	27.12	20.88
\$75,000 or more	23.25	15.38

Note: values are presented in percentages.

* indicates information compiled from the U.S. Census Bureau 2009.

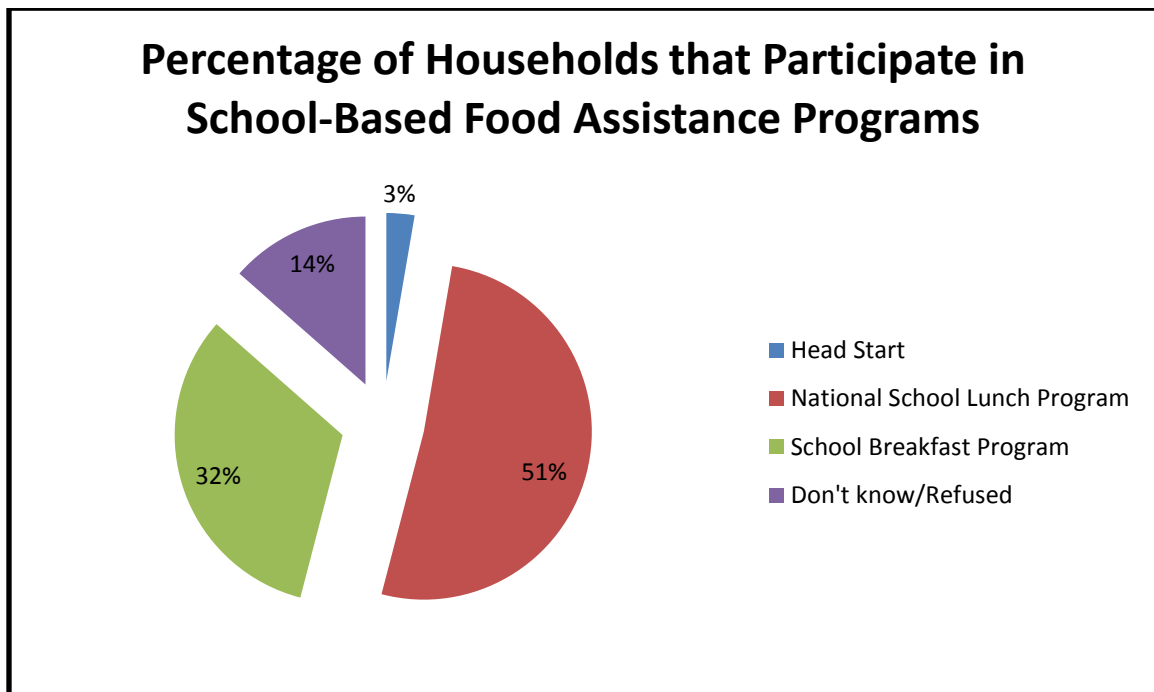


Figure 14. Percentage of Citizen Potawatomi Nation households that participate in school-based food assistance programs in Shawnee, Oklahoma, 2013.

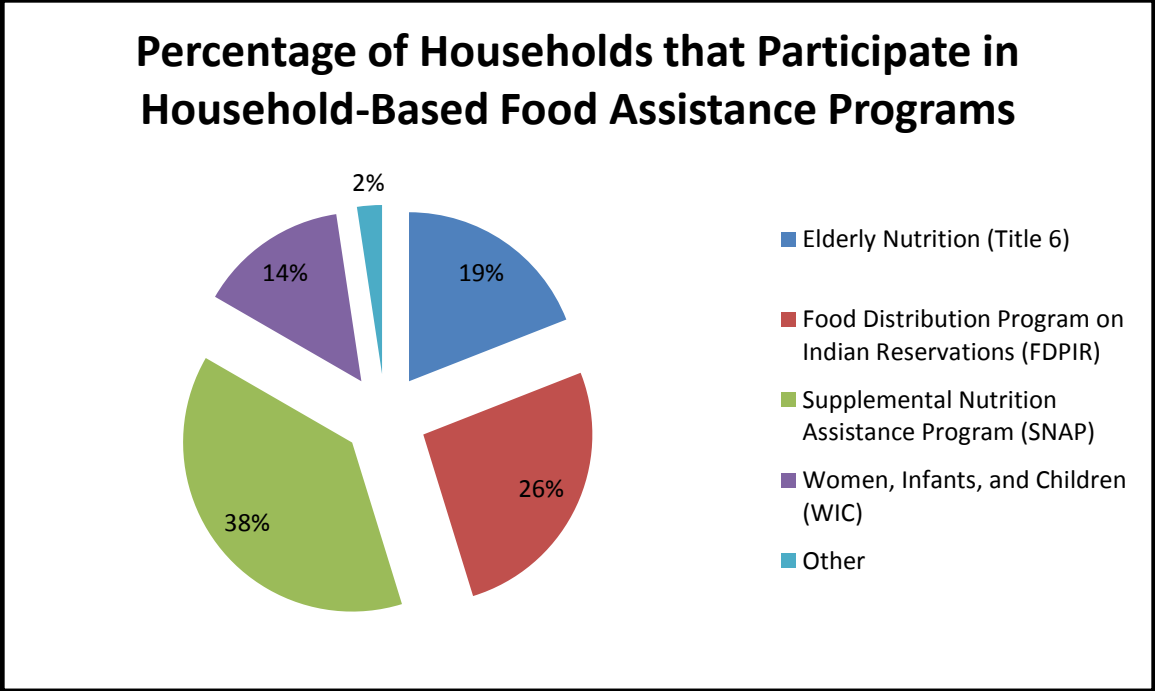


Figure 15. Percentage of Citizen Potawatomi Nation households that participate in household-based food assistance programs in Shawnee, Oklahoma, 2013.

Table 6. Characteristics of Citizen Potawatomi Nation Households in Shawnee, Oklahoma

	Household Food Secure	Household Food Insecure		
		(w/o hunger)	(w hunger, moderate)	(w hunger, severe)
Education				
High School, no diploma	8.47	31.81	25.00	16.67
High School, diploma	38.98	27.27	25.00	16.67
Some College	28.81	40.91	50.00	66.67
College Degree or higher	22.03	-	-	-
Income				
Less than \$10,000	3.39	36.36	-	33.33
\$10,000 to \$19,999	13.56	22.73	25.00	50.00
\$20,000 to \$39,999	13.56	18.18	50.00	16.67
\$40,000 to \$74,999	25.42	13.64	25.00	-
\$75,000 or more	23.73	-	-	-
Employment Status				
Employed	50.85	40.91	50.00	-
Unemployed	16.95	45.45	50.00	100.00
Retired	32.20	13.64	-	-
Food Assistance Program				
Head Start	1.69	-	-	-
National School Lunch	10.17	36.36	50.00	50.00
School Breakfast	6.78	22.73	50.00	16.67
SNAP	3.39	45.45	25.00	50.00
FDPIR	8.47	18.18	25.00	16.67
Title 6 (Elderly)	10.17	9.09	-	-
WIC	5.08	13.64	-	-
Unemployment				
Laid Off	-	4.55	-	-
Attending School	1.69	4.55	-	-
Lack Education Requirements	-	4.55	25.00	-
Health/Disabled	10.17	27.27	25.00	83.33
Transportation	1.69	-	25.00	-
Location	-	-	-	-
Tending to family	5.08	4.55	-	16.67
Retired	32.20	13.64	-	-

Note: values are presented in percentages.

CHAPTER IV

RESULTS

While the basic descriptive statistics identified several factors that potentially affect CPN households' food security levels, additional analysis was conducted to determine the relationship. In this section, general OLS regression models were used to analyze the impact of different household characteristics on various food security scores. Additionally, basic logit models were used to examine the impact of different household characteristics on various food security levels and participation in different food assistance programs. In both the OLS regression models and the logit models, five different models were estimated.

Regression Models

Regression results for the adult food security score, a range from 0 (food secure) to 10 (food insecure with hunger, severe), showed that when taking into account only education levels (Model 1), going from no high school diploma to obtaining a high school diploma or a college degree or higher decreased the adult food security score (Table 7). Of course, obtaining a college degree or higher decreased at a much higher value. When examining different income levels (Model 2), the adult food security score only decreased for households that make \$75,000 or more. As expected in Model 3, which considered different employment levels, going from employed to unemployed significantly increased ($p=0.01$) the adult food security score. When combining Models 1 and 2, we found that obtaining a high school diploma, a college degree or higher, and making \$75,000 or more in total household income was still significant in decreasing

the adult food security score (Model 3). Finally, results of Model 5, which combines Models 1-3, showed that the only significant factor that increased the adult food security scale was moving from employed to unemployed.

The regression model for the children food security score (Table 8), which ranges from 0 (food secure) to 8 (food insecure with hunger, severe), showed different significant factors than the adult food security score regression model. In Model 1, education levels were not significant by themselves; however, they were much more significant in Models 4 and 5. When examining only income levels in Model 2, the children food security scale increased for households that raised their income level from less than \$10,000 to \$10,000-\$19,999. As mentioned earlier, one possible explanation for this is the idea that households making less than \$10,000 are dependent on outside sources of welfare to survive. This was also shown in Table 6 and remained highly significant ($p=0.01$) in Models 2, 4, and 5. Once again, going from employed to unemployed was predicted to increase the children food security score as shown in Model 3. Similar to data in Table 6, Model's 4 and 5 both confirmed that a change to some college and income earnings of \$10,000-\$19,999 increased the children food security score. In Model 5, the children food security score decreased when the respondent went from employed to retired.

Logistic Regression Models

Taking into account all three of the food insecure categories (food insecure without hunger; food insecure with hunger, moderate; and food insecure with hunger, severe), a logit model was used to determine which household characteristics contribute to a household being classified as food insecure (Table 9). In Model 1, respondents that went from no high school diploma to obtaining a diploma were less likely to be food insecure (at any level). Additionally, households with a college degree or higher perfectly predicted being food secure. In other words, there were no observations where the head of the household had a college education and the

household was food insecure. Because of this lack of variation, no parameter estimate can be given for the college degree or higher variable. In Model 2, moving from a total household income of less than \$10,000 to \$40,000-\$74,999 decreased the likelihood of being classified as any of the food insecure categories. Also, respondents going from a total household income of less than \$10,000 to \$75,000 or more perfectly predicts being food secure. Once again, households that change from employed to unemployed had a higher likelihood of being classified as any of the food insecure categories (as shown in Model 3). In Model 4, obtaining a high school diploma and making \$40,000-\$74,999 in total household income, decreased the likelihood of being classified as any of the food insecure categories. Furthermore, as found in Models 1 and 2, the highest levels of income and education perfectly predicted being food secure in both Models 4 and 5. Finally, in Model 5, only a change from an employed to retired household significantly decreased the likelihood of being classified as any of the food insecure categories. It is important to mention that when including households with children in all five models (Table 10), households with children had no significance. Therefore, Hypothesis 2 was rejected.

Breaking apart food insecure categories revealed additional differences between households. Therefore, a logit model with the dependent variable food insecure without hunger was constructed (Table 11). Similarly, results in Model 1 revealed that going from no high school diploma to obtaining a diploma, decreased the likelihood of being classified as food insecure without hunger. Unlike results in Table 9 though, levels of education, income, and employment were not significant in Models 2-4. However, in Model 5, a change in household income from less than \$10,000 to \$40,000-\$74,999 decreased the likelihood of being classified as food insecure without hunger. Once again, the highest levels of income and education perfectly predicted being food secure. Another logit model with the dependent variable food insecure with hunger, moderate and severe groups combined was constructed (Table 12). Unlike the results in Tables 9 and 11, education levels alone were not significant in Model 1. Levels of income alone

were also found to be insignificant in Model 2 and then combined with education levels in Model 4. The change from the respective baselines to attending some college, making \$10,000-\$19,999, and being unemployed, increased the likelihood of being classified as food insecure with hunger (combining both categories of moderate and severe) as shown in Model 5. It is important to mention that the highest levels of income and education, along with being retired, perfectly predicted being food secure.

Logistic regression models were also constructed for different food assistance programs. As stated in Hypothesis 4, characteristics used to predict participation in one food assistance program were different than those used to predict participation in other assistance programs. Logistic regression results for households that participate in SNAP are shown in Table 13. The only significant factor that was likely to increase participation in SNAP was the change from being employed to unemployed in Model 3. This was expected and so was the fact that the two highest levels of income perfectly predicted non-participation in SNAP.

Logistic results for households participating in WIC are shown in Table 14. A change from no high school diploma to attending some college decreased the likelihood of participating in WIC in every model that included education levels. This was the only significant factor identified with the assumption that the highest levels of income and education perfectly predicted non-participation in WIC and, therefore, were omitted.

Table 15 shows that differences in education and income levels were more significant than in the SNAP and WIC logistic regression models. Households that change from no high school diploma to obtaining a high school diploma had a lower likelihood of participating in FDPIR in every model that included education. Furthermore, every model that included income levels showed that a change from making less than \$10,000 to \$10,000-\$19,999 significantly increased the likelihood of participating in FDPIR. It is important to note that the two highest

levels of income and highest level of education perfectly predicted non-participation in FDPIR. Additionally, variable factors of different employment levels did not converge due to non-concavity of the regression function and had exceedingly high standard errors in Model 5. According to Steenbergen (2003), data reports that state “not concave” indicate “that the log-likelihood function is essentially flat at a particular iteration” (p. 10). The reason for this might be the small sample size in this study.

In Table 16, the dependent variable was participation in the Title 6 Nutrition program and all five models were insignificant. However, an interesting finding was that income levels of \$40,000-\$74,999 perfectly predicted non-participation in Title 6, thus they were omitted and not considered significant in the models. Once again in this logistic regression function, variable factors of different employment levels did not converge due to non-concavity and had exceedingly high standard errors in Model 5.

Finally, the logistic regression results for households which participate in the National School Lunch program are shown in Table 17. In Model 1, every level of education was significant in decreasing the likelihood of participating in the National School Lunch program. In Models 2, 4, and 5, going from a total household income of less than \$10,000 to \$10,000-\$19,999 increased the likelihood of participating in the National School Lunch program. Once again, this was not a new finding as it was found to be significant in the participation of FDPIR. A change from no high school diploma to obtaining a high school diploma or attending some college decreased the likelihood of participation in this program (Model 4). Additionally, the only education level significant in decreasing participation in the National School Lunch program was the change in obtaining a high school diploma (Model 5). It is also important to mention that being retired perfectly predicted non-participation in the National School Lunch program.

Table 7. Regression results for adult food security score

Dependent variable: adultfs_score										
	Model 1		Model 2		Model 3		Model 4		Model 5	
	<i>Coef.</i>	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Education										
High School, diploma	-1.911	0.861**					-1.611	0.846*	-0.734	0.821
Some College	-0.485	0.857					-0.062	0.840	0.728	0.814
College Degree or higher	-3.190	1.038***					-2.075	1.083*	-1.039	1.046
Income Level										
\$10,000 to \$19,999			0.948	0.853			0.995	0.826	0.949	0.781
\$20,000 to \$39,999			0.521	0.887			0.464	0.857	0.573	0.802
\$40,000 to \$74,999			-1.241	0.825			-1.099	0.813	-0.684	0.770
\$75,000 or more			-2.346	0.906***			-1.817	0.942*	-1.456	0.939
Employment Status										
Unemployed					2.623	0.636***			1.746	0.712**
Retired					-0.660	0.686			-1.074	0.708
Constant	3.267	0.707	2.346	0.536	1.341	0.405	3.103	0.783	1.949	0.891
Number of Observations	91		91		91		91		91	
Adjusted R-square	0.108		0.111		0.199		0.172		0.281	

*, **, and *** indicated statistically significant differences from zero at the p=0.10, 0.05, and 0.01 levels, respectively.

Table 8. Regression results for children food security score

Dependent variable: childrenfs_score										
	Model 1		Model 2		Model 3		Model 4		Model 5	
	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.
Education										
High School, diploma	0.153	0.429					0.264	0.402	0.601	0.401
Some College	0.515	0.427					0.725	0.400*	0.992	0.397**
College Degree or higher	-0.267	0.517					0.111	0.515	0.486	0.511
Income Level										
\$10,000 to \$19,999			1.416	0.395***			1.433	0.393***	1.472	0.381***
\$20,000 to \$39,999			0.169	0.411			0.129	0.408	0.141	0.392
\$40,000 to \$74,999			-0.126	0.382			-0.217	0.386	-0.096	0.376
\$75,000 or more			-0.231	0.420			-0.186	0.448	-0.188	0.459
Employment Status										
Unemployed					0.719	0.324**			0.429	0.347
Retired					-0.317	0.349			-0.693	0.346**
Constant	0.267	0.352	0.231	0.248	0.317	0.206	-0.114	0.372	-0.375	0.435
Number of Observations	91		91		91		91		91	
Adjusted R-square	0.006		0.144		0.067		0.159		0.230	

*, **, and *** indicated statistically significant differences from zero at the p=0.10, 0.05, and 0.01 levels, respectively.

Table 9. Logistic regression results for all food insecure households (without hunger and with hunger at both levels)

Dependent variable: all food insecure households										
	Model 1		Model 2		Model 3		Model 4		Model 5	
	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.
Education										
High School, diploma	-1.462	0.668**					-1.349	0.716*	-0.780	0.776
Some College	-0.531	0.635					-0.162	0.704	0.429	0.794
College Degree or higher	-	-					-	-	-	-
Income Level										
\$10,000 to \$19,999			0.272	0.625			0.296	0.689	0.583	0.783
\$20,000 to \$39,999			0.021	0.650			-0.076	0.709	-0.065	0.767
\$40,000 to \$74,999			-1.168	0.687*			-1.224	0.740*	-1.182	0.793
\$75,000 or more			-	-			-	-	-	-
Employment Status										
Unemployed					1.591	0.529***			0.652	0.677
Retired					-0.843	0.714			-1.691	0.843**
Constant	0.405	0.527	-0.154	0.393	-1.003	0.352	0.617	0.647	0.209	0.851
Number of Observations		78		77		91		71		71
Pseudo R-square		0.055		0.047		0.138		0.114		0.214

*, **, and *** indicated statistically significant differences from zero at the p=0.10, 0.05, and 0.01 levels, respectively.

- indicated that the highest levels of income and education perfectly predicted being food secure and those variables are therefore omitted.

Table 10. Logistic regression results all food insecure households (without hunger and with hunger at both levels)

Dependent variable: all food insecure households										
	Model 1		Model 2		Model 3		Model 4		Model 5	
	<i>Coef.</i>	<i>S.E.</i>	<i>Coef.</i>	<i>S.E.</i>	<i>Coef.</i>	<i>S.E.</i>	<i>Coef.</i>	<i>S.E.</i>	<i>Coef.</i>	<i>S.E.</i>
Households with Children	0.376	0.482	0.597	0.508	0.274	0.509	0.867	0.573	0.371	0.688
Education										
High School, diploma	-1.468	0.671**					-1.374	0.728*	-0.803	0.778
Some College	-0.524	0.638					-0.135	0.713	0.441	0.798
College Degree or higher	-	-					-	-	-	-
Income Level										
\$10,000 to \$19,999			0.108	0.647			0.095	0.723	0.448	0.827
\$20,000 to \$39,999			0.005	0.657			-0.062	0.711	-0.029	0.765
\$40,000 to \$74,999			-1.353	0.715*			-1.562	0.791**	-1.313	0.833
\$75,000 or more			-	-			-	-	-	-
Employment Status										
Unemployed					1.625	0.535***			0.746	0.705
Retired					-0.725	0.748			-1.460	0.934
Constant	0.234	0.571	-0.339	0.427	-1.141	0.464	0.355	0.669	-1.460	0.934
Number of Observations		78		77		91		71		71
Pseudo R-square		0.061		0.060		0.141		0.139		0.217

*, **, and *** indicated statistically significant differences from zero at the p=0.10, 0.05, and 0.01 levels, respectively.

- indicated that the highest levels of income and education perfectly predicted being food secure and those variables are therefore omitted.

Table 11. Logistic regression results for food insecure without hunger households

Dependent variable: food insecure without hunger group										
	Model 1		Model 2		Model 3		Model 4		Model 5	
	<i>Coef.</i>	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Education										
High School, diploma	-1.294	0.689*					-1.171	0.723	-1.023	0.761
Some College	-0.805	0.650					-0.586	0.692	-0.552	0.731
College Degree or higher	-	-					-	-	-	-
Income Level										
\$10,000 to \$19,999			-0.405	0.668			-0.495	0.702	-0.348	0.725
\$20,000 to \$39,999			-0.542	0.710			-0.648	0.742	-0.748	0.760
\$40,000 to \$74,999			-1.204	0.747			-1.166	0.779	-1.329	0.817*
\$75,000 or more			-	-			-	-	-	-
Employment Status										
Unemployed					0.681	0.546			-0.453	0.668
Retired					-0.578	0.727			-1.194	0.816
Constant	-0.405	0.527	-0.470	0.403	-1.269	0.377	0.362	0.633	0.760	0.823
Number of Observations	78		77		91		71		71	
Pseudo R-square	0.039		0.032		0.035		0.072		0.098	

*, **, and *** indicated statistically significant differences from zero at the p=0.10, 0.05, and 0.01 levels, respectively.

- indicated that the highest levels of income and education perfectly predicted being food secure and those variables are therefore omitted.

Table 12. Logistic regression results for food insecure with hunger, moderate & severe households

Dependent variable: food insecure with hunger, moderate and severe groups combined										
	Model 1		Model 2		Model 3		Model 4		Model 5	
	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.
Education										
High School, diploma	-0.802	1.054					-0.684	1.088	0.104	1.168
Some College	0.405	0.884					0.760	0.937	1.943	1.121*
College Degree or higher	-	-					-	-	-	-
Income Level										
\$10,000 to \$19,999			1.306	0.932			1.434	0.970	1.973	1.146*
\$20,000 to \$39,999			1.099	0.979			1.068	1.007	1.588	1.180
\$40,000 to \$74,999			-0.405	1.264			-0.476	1.292	0.587	1.476
\$75,000 or more			-	-			-	-	-	-
Employment Status										
Unemployed					2.054	0.837***			2.118	1.111*
Retired					-	-			-	-
Constant	-1.872	0.760	-2.485	0.736	-2.970	0.725	-2.564	1.024	-4.773	1.706
Number of Observations	78		77		69		71		52	
Pseudo R-square	0.038		0.067		0.133		0.119		0.242	

*, **, and *** indicated statistically significant differences from zero at the p=0.10, 0.05, and 0.01 levels, respectively.

- indicated that the highest levels of income and education, along with being retired, perfectly predicted being food secure and those variables are therefore omitted.

Table 13. Logistic regression results for households that participate in SNAP

Dependent variable: SNAP											
	Model 1		Model 2		Model 3		Model 4		Model 5		
	<i>Coef.</i>	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	
Education											
High School, diploma	-0.637	0.761					-0.326	0.817	0.527	0.925	
Some College	-0.675	0.760					-0.209	0.816	0.264	0.903	
College Degree or higher	-0.693	0.965					0.492	1.128	0.882	1.319	
Income Level											
\$10,000 to \$19,999			0.642	0.662			0.704	0.674	1.266	0.822	
\$20,000 to \$39,999			-0.873	0.879			-0.833	0.884	-0.991	0.919	
\$40,000 to \$74,999			-	-			-	-	-	-	
\$75,000 or more			-	-			-	-	-	-	
Employment Status											
Unemployed					1.176	0.592**			-0.084	0.759	
Retired					-	-			-	-	
Constant	-1.012	0.584	-0.999	0.442	-1.764	0.442	-0.896	0.699	-0.923	0.926	
Number of Observations	91		58		69		58		43		
Pseudo R-square	0.011		0.047		0.055		0.056		0.111		

*, **, and *** indicated statistically significant differences from zero at the p=0.10, 0.05, and 0.01 levels, respectively.

- indicated that the two highest levels of income and being retired perfectly predicted non-participation in SNAP and those variables are therefore omitted.

Table 14. Logistic regression results for households that participate in WIC

Dependent variable: WIC											
	Model 1		Model 2		Model 3		Model 4		Model 5		
	<i>Coef.</i>	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	
Education											
High School, diploma	-1.288	0.975					-1.708	1.090	-1.641	1.197	
Some College	-2.048	1.204*					-2.337	1.300*	-2.322	1.401*	
College Degree or higher	-	-					-	-	-	-	
Income Level											
\$10,000 to \$19,999			1.204	1.268			1.241	1.325	1.251	1.328	
\$20,000 to \$39,999			0.580	1.453			0.688	1.508	0.655	1.514	
\$40,000 to \$74,999			1.079	1.264			1.710	1.406	1.667	1.415	
\$75,000 or more			-	-			-	-	-	-	
Employment Status											
Unemployed					0.850	0.948			-0.119	1.122	
Retired					-0.074	1.254			-0.317	1.352	
Constant	-1.386	0.645	-3.219	1.020	-2.970	0.725	-2.025	1.095	-1.915	1.388	
Number of Observations		78		77		91		71		71	
Pseudo R-square		0.084		0.029		0.024		0.128		0.130	

*, **, and *** indicated statistically significant differences from zero at the p=0.10, 0.05, and 0.01 levels, respectively.

- indicated that the highest levels of income and education perfectly predicted non-participation in WIC and those variables are therefore omitted.

Table 15. Logistic regression results for households that participate in FDPIR

Dependent variable: FDPIR										
	Model 1		Model 2		Model 3		Model 4		Model 5	
	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.
Education										
High School, diploma	-2.708	1.155**					-2.836	1.252**	-3.397	1.455**
Some College	-0.993	0.733					-0.618	0.832	-0.603	0.988
College Degree or higher	-	-					-	-	-	-
Income Level										
\$10,000 to \$19,999			1.431	0.796*			1.803	0.903**	2.113	1.061**
\$20,000 to \$39,999			0.165	0.977			0.170	1.025	0.584	1.131
\$40,000 to \$74,999			-	-			-	-	-	-
\$75,000 or more			-	-			-	-	-	-
Employment Status										
Unemployed					+	+			17.371	2202.901
Retired					+	+			17.349	2202.902
Constant	-0.693	0.548	-2.037	0.614			-1.109	0.774	-18.076	2202.902
Number of Observations		78		58				53		53
Pseudo R-square		0.123		0.069				0.210		0.377

*, **, and *** indicated statistically significant differences from zero at the p=0.10, 0.05, and 0.01 levels, respectively.

- indicated that the two highest levels of income and highest level of education perfectly predicted non-participation in FDPIR and those variables are therefore omitted.

+ indicated that this model does not converge due to non-concavity of the regression function. Note that the S.E. for this variable are exceedingly high in model 5.

Table 16. Logistic regression results for households that participate in Title 6 (Elderly) Nutrition program

Dependent variable: ELDERLY										
	Model 1		Model 2		Model 3		Model 4		Model 5	
	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.
Education										
High School, diploma	0.990	1.145					1.327	1.163	1.142	1.291
Some College	-0.795	1.450					-0.531	1.466	-0.570	1.541
College Degree or higher	0.154	1.468					0.433	1.598	-15.124	3739.841
Income Level										
\$10,000 to \$19,999			0.944	0.973			0.849	1.005	0.325	1.062
\$20,000 to \$39,999			0.613	1.058			0.642	1.092	0.774	1.191
\$40,000 to \$74,999			-	-			-	-	-	-
\$75,000 or more			-0.080	1.272			0.037	1.397	34.189	6633.249
Employment Status										
Unemployed									50.378	8134.873
Retired									51.090	8134.873
Constant	-2.639	1.035	-2.485	0.736			-3.011	1.219	-52.938	8134.873
Number of Observations		91		72				72		72
Pseudo R-square		0.064		0.026				0.102		0.371

*, **, and *** indicated statistically significant differences from zero at the p=0.10, 0.05, and 0.01 levels, respectively.

- indicated that the income level of \$40,000-\$74,999 perfectly predicted non-participation in Title 6 and are therefore omitted.

+ indicated that this model does not converge due to non-concavity of the regression function. Note that the S.E. for this variable are exceedingly high in model 5.

Table 17. Logistic regression results for households that participate in National School Lunch program

Dependent variable: School Lunch											
	Model 1		Model 2		Model 3		Model 4		Model 5		
	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.	<i>Coef.</i>	S.E.	
Education											
High School, diploma	-1.776	0.745**					-2.178	0.917**	-1.970	1.176*	
Some College	-1.333	0.688**					-1.338	0.814*	-1.463	1.060	
College Degree or higher	-1.571	0.927*					-1.407	1.118	-1.947	1.342	
Income Level											
\$10,000 to \$19,999			2.394	0.787***			2.805	0.888***	4.995	1.497***	
\$20,000 to \$39,999			0.651	0.891			0.788	0.942	0.477	0.977	
\$40,000 to \$74,999			-0.853	1.197			-0.395	1.247	-0.877	1.291	
\$75,000 or more			0.245	0.980			0.514	1.094	-0.331	1.128	
Employment Status											
Unemployed					0.681	0.546			-1.611	1.080	
Retired					-	-			-	-	
Constant	-0.134	0.518	-2.037	0.614	-1.269	0.377	-0.989	0.743	0.182	1.110	
Number of Observations	91		91		69		91		69		
Pseudo R-square	0.071		0.185		0.019		0.255		0.379		

*, **, and *** indicated statistically significant differences from zero at the p=0.10, 0.05, and 0.01 levels, respectively.

- indicated that being retired perfectly predicted non-participation in National School Lunch and those variables are therefore omitted.

CHAPTER V

CONCLUSION, POLICY RECOMMENDATIONS, AND FUTURE RESEARCH

Even though food security is widely researched, this study is truly a first at representing Oklahoma tribes when examining household food security and different characteristics that affect various food assistance programs. With a response rate of nearly 60% and a total of 91 completed household surveys, this study provides valuable information regarding the impact of various national issues, such as health, education, employment status, and financial well-being, on Oklahoma tribes. Using basic descriptive statistics and uncovering household characteristics through regression models, this research provides useful information to policy-makers and tribal officials and members.

In terms of the concerned population, around 30% of adults and 10% of children in CPN households were considered food insecure to some degree. When examining at a household level, over 35% of CPN households were considered food insecure to some degree. This is higher than the national level of nearly 15% for all U.S. households (Coleman-Jensen et al. 2012) and higher than the national level of 23% for American Indians/Alaska Natives (U.S. Department of Agriculture 2012c). Of these households, nearly 11% were food insecure with hunger present. Around 34% of households obtained a high school diploma and 35% attended some college. Roughly 15% attended high school but did not obtain a diploma and less than 15% obtained a college degree or higher. For the CPN, the percentage of high school graduates and students entering into college are higher than the national average for American Indians/Alaska Natives. However, the percentage of high school dropouts without a diploma and students with a college

degree was found to be much lower than the national average for American Indians/Alaska Natives. Unemployment is higher than the national average among CPN households that were surveyed in Shawnee, Oklahoma. At the time of the survey, nearly 31% of the households were unemployed compared to the current national unemployment rate of 7.6%. Income levels were also strikingly low for CPN households. Nearly 50% of the surveyed households made less than \$40,000 yearly and around 31% made less than \$19,999 in total household income. In general, CPN households that earn less than \$20,000 were higher than the national average, however, households earning \$20,000 or more were extremely lower on a national level. It was no surprise that food insecure households utilize food assistance programs to overcome food insecurity, and even worse hunger. The two main food assistance programs utilized by the survey population were SNAP and FDPIR, at 38% and 26% respectively. Furthermore, out of the households with children that participated in a school-based food assistance program, over 50% participated in the National School Lunch program and 32% in School Breakfast program.

When examining various household characteristics among different food security statuses, obvious differences were observed. It is no surprise that food insecure households (without hunger; with hunger, moderate; and with hunger, severe) did not consist of any households that had earned a college degree or higher and had a household income level of \$75,000 or greater. An interesting finding was that a high percentage of households classified as food insecure (in any category) had attended some college. Specifically, out of the households classified as food insecure with severe hunger, nearly 67% had attended some college. Furthermore, out of this same group of food insecure with severe hunger, over 83% made a total household income of \$19,999 or less. The harmful effects of being unemployed were prevalent with the high percentage in the three different food insecure categories. Households with disabled or unemployed members were more likely to be in one of the three food insecure categories. An alarming 83.3% of households that were classified as food insecure with severe hunger were

unemployed because of some sort of disability. Addressing just this group of disabled is an area for future research and program recommendations.

In this study, various characteristics, including levels of education, income, and employment, were analyzed to determine how they affect the food security status of a household and the household's participation in food assistance programs. Based on this information, appropriate policy recommendations can be formed that could potentially help improve the socioeconomic status of tribal households and ultimately the health of the households.

First, when addressing households without children, the real solution is in education. This research found that improvements in education levels, specifically obtaining a high school diploma and college degree or higher, reduced the adult food security score. Education would be more realistic for a policy focus for this group because the other significant factor when addressing households without children is advancing them over \$75,000 or more in total household income. Of course, the adult food security scale increased for households that lost employment, so promoting more employment opportunities could potentially benefit the tribal households. Secondly, when addressing households with children, the possible solution is more complex. Once again, a loss in employment by households with children increased the children food security score. Other factors that surprisingly increased the children food security score were an increase in income levels of \$10,000-\$19,999 and attending some college. One possible explanation for this is that households that have less than a college degree and make less than \$10,000 are dependent or rely on outside sources of welfare to survive. Moreover, some of the households visited from personal observation had multiple families living in the home, grandparents raising their grandchildren, and some households had three generations living in the home. Therefore, these types of households might be able to support themselves adequately, however, they have more individuals who are dependent on them and it strains all of the resources.

Next, when addressing all food insecure households, obtaining a high school diploma or earning over \$40,000 decreased the likelihood of being classified as food insecure. From a recommendation standpoint, encouraging the completion of just high school is critical for households that are classified in any of the food insecure categories. It is also important to mention that some research finds that households with children are more likely to be food insecure than households without children. However, in our study of 91 CPN households, households with children had no significance to whether it would be classified as food secure or food insecure. Not surprisingly, a loss of employment increased the likelihood of being classified as food insecure. Then, with the food insecure categories broken into food insecure households without hunger and food insecure households with hunger (moderate and severe levels), additional differences were examined. Only a high school diploma and earning \$40,000 or more in total household income were the only two factors that decreased the likelihood of being classified as food insecure without hunger. In contrast, attending some college, earning \$10,000-\$19,999, and of course, employment loss, all increased the likelihood of being classified as food insecure with hunger at both severity levels. It is also important to mention that in most of these models, the highest level of education and income perfectly predicted being food secure.

Finally, when addressing households that participate in various food assistance programs, the extent and degree of significance levels of education, income, and employment varies. For example, in this research, levels of education and income did not have any significance on participation in SNAP. However, it is important to mention that the two highest levels of education and being retired perfectly predicted non-participation, thus they were omitted from the model. The only other factor that was significant in increasing the likelihood of SNAP participation was the loss of employment. In all 5 food assistance programs observed, SNAP was the only one that was affected by employment levels. The only factor that tended to decrease participation in WIC was attending some college. Though, it is important to mention that the

highest levels of education and income perfectly predicted non-participation in WIC, thus they were omitted from the model. By just obtaining a high school diploma, CPN households decreased the likelihood of participating in FDPIR. However, it was noticed that by increasing their total household income level to \$10,000-\$19,999, CPN households increased their likelihood of participating in FDPIR. Regarding household participation in FDPIR, the two highest income levels and the highest education level perfectly predicted non-participation, thus these variables were omitted from the model. There were no significant variables in the model determining participation in Title 6, the elderly nutrition program for the CPN. Furthermore, it was found that increases in all education levels decreased the likelihood of participation in the National School Lunch program. Also, increasing total household income levels to \$10,000-\$19,999 was found to increase the likelihood of participation in the National School Lunch program. Additionally, 37.5 % of households were classified as food insecure but do not participate in SNAP or FDPIR. Future research is needed to address why these households are not participating in a food assistance program. Because of the different structure and objectives that each food assistance program is tasked with, tribal officials and other policy-makers must carefully address them differently.

It is also important to address the elderly population within the CPN. During a focus group meeting, many were concerned that transportation issues could be a major factor affecting the tribe, specifically the elders. However, our research showed that transportation was not a problem for the entire tribe. This is probably because the CPN already provides transportation for its tribal members. They have numerous vehicles providing transportation to doctors' appointments, grocery stores, and other locations. If the tribe did not already provide this public service, then transportation would probably be an issue for many. Additionally, many of the regression models showed that being classified as retired decreased the likelihood of being food insecure and participating in different food assistance programs. The elderly population resides

close to the tribe headquarters to gain full access to tribal benefits, such as healthcare, food assistance, and elderly housing. The CPN has provided great care to the elderly population and should continue to provide the different services to this special group.

In conclusion, just as tribes across the country are different in their own rights, the level of severity for food security and socioeconomic characteristics vary among different categories even within a single tribe. This study provides the first analysis of a Native American tribe in Oklahoma and provides information to help address the “health” of its nation. Unfortunately, when researching food security levels, Oklahoma tribes are misrepresented through national research and lack information which could help drive policy implementations. Granted, there is much more research still needed on food insecurity among tribes in Oklahoma. With 38 federally recognized tribes in Oklahoma, the different levels of education, income, and employment are unknown and are potentially hindering them from meeting the definition of food secure. Being able to understand through research such as ours where tribes and their members stand, tribes, agencies, and other policy-makers will be able to better address these national issues that affect tribes, mostly in negative ways. Much more research is needed to accurately address these issues that ultimately affect each other, not just food insecurity by themselves.

REFERENCES

- Algernon, A. 2010. "Different Race, Different Recession: American Indian Unemployment in 2010." Issue Brief. No. 289, Economic Policy Institute, Nov.
- Andrews, M. and M. Nord. 2009. "Food Insecurity Up in Recessionary Times." Washington DC: U.S. Department of Agriculture, Economic Research Service, *Amber Waves* 7(4): 32-36.
- Bhattacharya, J., J. Currie, and S. Haider. 2004. Poverty, Food Insecurity, and Nutritional Outcomes in Children and Adults. *Journal of Health Economics* 23: 839-862.
- Bickel, G., M. Nord, C. Price, W. Hamilton, and J. Cook. 2000. *Guide to Measuring Household Food Security: Revised 2000*. U.S. Department of Agriculture, Food and Nutrition Service. Alexandria, VA: Office of Analysis and Evaluation.
- Borjas, G. J. 2004. Food Insecurity and Public Assistance. *Journal of Public Economics* 88: 1421-1443.
- Brooks, L. and B. Whitacre. 2011. Critical Access Hospitals and Retail Activity: An Empirical Analysis in Oklahoma. *The Journal of Rural Health* 27: 29-38.
- Broussard, B., A. Johnson, J. Himes, M. Story, R. Fichtner, F. Hauck, K. Bachman-Carter, J. Hayes, K. Frohlich, N. Gray, S. Valway, and D. Gohdes. 1991. Prevalence Of Obesity In American Indians And Alaska Natives. *The American Journal of Clinical Nutrition* 53: 1535S-1542S.
- Bureau of Indian Affairs. 2010. "Indian Entities Recognized and Eligible to Receive Services from the United States Bureau of Indian Affairs." *Federal Register* 75(190):60810-14.
- Coleman-Jensen, A., M. Nord, M. Andrews, and S. Carlson. 2012. *Household Food Security in the United States in 2011*. U.S. Department of Agriculture, Economic Research Service,

- Economic Research Report 141. Washington DC: U.S. Government Printing Office.
- Companion, M. 2008. "An Overview of the State of Native American Health: Challenges and Opportunities." University of Colorado. Retrieved from <http://www.uccs.edu/Documents/soc/companionspring2012/soc3270/Segment%201/Companion%20-%20Indian%20Health%20Report.pdf>.
- Cook, J. and K. Jeng. 2009. Feeding America. *Child Food Insecurity: The Economic Impact on our Nation Report*.
- Cunningham, K. 2012. *Reaching Those in Need: State Supplemental Nutrition Assistance Program Participation Rates in 2010*. Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, December 2012.
- Ericksen, E.P. 1997. Problems in Sampling the Native American and Alaska Native Populations. *Population Research and Policy Review* 16: 43-59.
- FAO. 2002. The State of Food Insecurity in the World 2001. Rome. Retrieved from http://www.fao.org/docrep/003/y1500e/y1500e06.htm#P0_2.
- Finegold, K., N. Pindus, D. Levy, T. Tannehill, and W. Hillabrant. 2009. "Tribal Food Assistance: A Comparison of the Food Distribution Program on Indian Reservations (FDPIR) and the Supplemental Nutrition Assistance Program (SNAP)." The Urban Institute. Retrieved from http://www.urban.org/uploadedpdf/412034_tribal_food_assistance.pdf.
- Galloway, JM. 2005. Cardiovascular Health Among American Indians and Alaska Natives: Successes, Challenges and Potentials. *American Journal of Preventive Medicine* 29: 11-17.
- Gordon, A. and V. Oddo. 2012. "Addressing Child Hunger and Obesity in Indian Country: Report to Congress." Mathematica Policy Research Final Report. Retrieved from <http://www.fns.usda.gov/ora/MENU/Published/CNP/FILES/IndianCountry.pdf>.

- Gundersen, C. 2007. Measuring the Extent, Depth, and Severity of Food Insecurity: An Application to American Indians in the USA. *Journal of Population Economics* 21: 191-215.
- Gundersen, C., B. Kreider, and J. Pepper. 2011. The Economics of Food Insecurity in the United States. *Applied Economic Perspectives and Policy* 33: 281-303.
- Huysen, K. R., A. Sakamoto, and I. Takei. 2010. "The Persistence of Racial Disadvantage: The Socioeconomic Attainments of Single-Race and Multi-Race Native Americans." *Population Research and Policy Review* 29:541-568.
- Jackson, M.-Y. 1986. Nutrition in American Indian Health: Past, Present, and Future. *Journal of American Dietetics Association* 86(11): 1561-1565.
- Jernigan, V., A. Salvatore, D. Styne, and M. Winkleby. 2011. Addressing Food Insecurity In a Native American Reservation Using Community-Based Participatory Research. *Health Education Research* 1-11.
- Jyoti, D.F., E.A Frongillo, and S. J. Jones 2005. Food Insecurity Affects School Children's Academic Performance, Weight Gain, and Social Skills. *The Journal of Nutrition* 135: 2831-2839.
- Kirlin, J. 2007. Memorandum on Estimated Retail Cost of an FDPIR Food Package in FY 2006. Food and Nutrition Service.
- Lavelle, B., M. Larsen, and C. Gundersen. 2009. Research Synthesis Strategies for Surveys of American Indians. *Public Opinion Quarterly* 73: 385-403.
- Leverett, C. 2008. "Key Statistics: American Indians and Alaska Natives." The Graduate Management Admission Council, pp. 1-4.
- Mullany, B., N. Neault, D. Tsingine, J. Powers, V. Lovato, L. Clitso, S. Massey, A. Talgo, K. Speakman, and A. Barlow. 2012. Food Insecurity and Household Eating Patterns among Vulnerable American-Indian Families: Associations with Caregiver and Food Consumption Characteristics. *Public Health Nutrition* 16(4): 752-760.

- Nord, M., and A. Golla. 2009. Does SNAP Decrease Food Insecurity? Untangling the Self-Selection Effect. U.S. Department of Agriculture, Economic Research Service, Economic Research Report 85. Washington DC: U.S. Government Printing Office.
- Nord, M., Andrew, M., and S. Carlson. 2008. Household Food security in the United States, 2007. U.S. Department of Agriculture, Economic Research Service, Economic Research Report 66. Washington DC: U.S. Government Printing Office.
- Nord, M. and H. Hopwood. 2007. "Recent Advances Provide Improved Tools for Measuring Children's Food Security." *Journal of Nutrition* 137: 533-536.
- Oliveira, Victor. 2012. The Food Assistance Landscape FY 2011 Annual Report. U.S. Department of Agriculture, Economic Research Service Bulletin 93. Washington DC: U.S. Government Printing Office.
- Olson, C.M. 1999. Nutrition and Health Outcomes Associated with Food Insecurity and Hunger. *Journal of Nutrition* 129: 521S-524S.
- Olson, C.M., K. Anderson, E. Kiss, F.C. Lawrence, and S.B. Seiling. 2004. "Factors Protecting Against and Contributing to Food Insecurity Among Rural Families." *Family Economics and Nutrition Review* 16(1): 12-20.
- Ratcliffe, C., S. McKernan, and S. Zhang. 2011. How Much Does The Supplemental Nutrition Assistance Program Reduce Food Insecurity? *American Journal of Agricultural Economics* 1-16.
- Story, M., M. Evans, R.R. Fabsitz, T. Clay, B. Holy Rock, and B. Broussard. 1999. The Epidemic Of Obesity In American Indian Communities And The Need For Childhood Obesity-Prevention Programs. *The American Journal of Clinical Nutrition* 69(suppl): 747S-754S.
- Steenbergen, M.R. 2003. Maximum Likelihood Programming in Stata. University of North Carolina, Chapel Hill. Retrieved from http://www.unc.edu/~monogan/computing/r/MLE_in_Stata.pdf

- Strauss, K.F., A. Mokdad, C. Ballew, J. Mendlein, J. Will, H. Goldberg, L. White, and M. Serdula. 1997. The Health Of Navajo Women: Findings From The Navajo Health and Nutrition Survey. *The Journal of Nutrition* 127: 2128S-2133S.
- U.S. Department of Agriculture. 2011. “Special Supplemental Nutrition Program for Women, Infants and Children (WIC): Income Eligibility Guidelines.” U.S. Department of Agriculture, Food and Nutrition Service. Washington DC. *Federal Register* 76(57): 16599-16602.
- U.S. Department of Agriculture. 2012a. “ Food Distribution Program on Indian Reservations”. U.S. Department of Agriculture, Food and Nutrition Service, Nutrition Program Fact Sheet. Retrieved from <http://www.fns.usda.gov/fdd/programs/fdpir/pfs-fdpir.pdf>.
- U.S. Department of Agriculture. 2012b. “WIC—The Supplemental Nutrition Program for Women, Infants and Children.” U.S. Department of Agriculture, Food and Nutrition Service, Nutrition Program Facts. Retrieved from <http://www.fns.usda.gov/wic/WIC-Fact-Sheet.pdf>.
- U.S. Department of Agriculture. 2012c. “Addressing Child Hunger and Obesity In Indian Country: Report to Congress Summary”. United States Department of Agriculture, Food and Nutrition Service. Retrieved from <http://www.fns.usda.gov/fns/tribal/documents/IndianCountrySummary.pdf>.
- U.S. Department of Agriculture. 2013. “Supplemental Nutrition Assistance Program: Fact Sheet on Resources, Income, and Benefits.” U.S. Department of Agriculture, Food and Nutrition Service. Retrieved from http://www.fns.usda.gov/snap/applicant_recipients/fs_Res_Ben_Elig.htm
- U.S. Department of Education. 2009. “*National Assessment of Educational Progress (NAEP), 2005, 2007, and 2009 National Indian Education Studies.*” U.S. Department of Education, National Center for Education Statistics. Washington DC. Retrieved from http://nces.ed.gov/nationsreportcard/nies/nies_2009/nas_sum_01.asp.

- U.S. Department of Commerce, Bureau of the Census. 2009. Statistical Abstract of the United States: 2012. Washington, DC. Retrieved from <http://www.census.gov/compendia/statab/2012/tables/12s0036.pdf>
- U.S. Department of Commerce, Bureau of the Census. 2011. 2010 Quick Facts. Washington, DC. Retrieved from <http://quickfacts.census.gov/qfd/index.html>.
- U.S. Department of Health & Human Services. 2012. "American Indian/Alaska Native Profile." U.S. Department of Health & Human Services, Office of Minority Health. Retrieved from <http://minorityhealth.hhs.gov/templates/browse.aspx?lvl=2&lvlid=52>
- Whitacre, B. 2007. Factors Influencing the Temporal Diffusion of Broadband Adoption: Evidence from Oklahoma. *The Annals of Regional Science* 42: 661-679.

APPENDICES

APPENDIX A

18-Question Core Food Security Module (CFSM) Questionnaire

1. "We worried whether our food would run out before we got money to buy more." Was that often, sometimes, or never true for you in the last 12 months?
 2. "The food that we bought just didn't last and we didn't have money to get more." Was that often, sometimes, or never true for you in the last 12 months?
 3. "We couldn't afford to eat balanced meals." Was that often, sometimes, or never true for you in the last 12 months?
 4. In the last 12 months, did you or other adults in the household ever cut the size of your meals or skip meals because there wasn't enough money for food? (Yes or No)
 5. (If yes to Question 4) How often did this happen- almost every month, some months but not every month, or in only 1 or 2 months?
 6. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food? (Yes or No)
 7. In the last 12 months, were you ever hungry, but didn't eat, because you couldn't afford enough food? (Yes or No)
 8. In the last 12 months, did you lose weight because you didn't have enough money for food? (Yes or No)
 9. In the last 12 months, did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food? (Yes or No)
 10. (If yes to Question 9) How often did this happen-almost every month, some months but not every month, or in only 1 or 2 months?
-

(Questions 11-18 are asked only if the household includes children aged 0-18 years)

11. "We relied on only a few kinds of low-cost food to feed our children because we were running out of money to buy food." Was that often, sometimes, or never true for you in the last 12 months?
12. "We couldn't feed our children a balanced meal, because we couldn't afford that." Was that often, sometimes, or never true for you in the last 12 months?
13. "The children were not eating enough because we just couldn't afford enough food." Was that often, sometimes, or never true for you in the last 12 months?
14. In the last 12 months, did you ever cut the size of any of the children's meals because there wasn't enough money for food? (Yes or No)
15. In the last 12 months, were the children ever hungry but you just couldn't afford more food? (Yes or No)
16. In the last 12 months, did any of the children ever skip a meal because there wasn't enough money for food? (Yes or No)
17. (If yes to Question 16) How often did this happen-almost every month, some months but not every month, or in only 1 or 2 months?
18. In the last 12 months, did any of the children ever not eat for a whole day because there wasn't enough money for food? (Yes or No)

APPENDIX B

Approval of Institutional Review Board (IRB)

Oklahoma State University Institutional Review Board

Date: Tuesday, November 27, 2012
IRB Application No: AG1258
Proposal Title: Oklahoma Tribal Food Security Outlook

Reviewed and Processed as: Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 11/26/2013

Principal Investigator(s):

Jody Campiche	Jeremy Benrott
528 Ag Hall	103 Ag Hall
Stillwater, OK 74078	Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval. Protocol modifications requiring approval may include changes to the title, PI, advisor, funding status or sponsor, subject population, composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Dawnett Watkins 219 Cordell North (phone: 405-744-5700 dawnett.watkins@okstate.edu)

Sincerely,



Sheila Kennison, Chair
Institutional Review Board

Thank you for completing the voluntary survey!

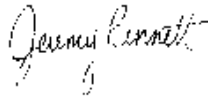
The purpose of this survey is to better understand tribal food security levels among tribal households and individuals in Oklahoma. Furthermore, it addresses a number of questions regarding food assistance programs and barriers experienced.

As stated prior to taking the survey, this survey is strictly anonymous and voluntary. Your tribe only supplied me with addresses. Names and other personal information were not given out by the tribe. Your name was never asked during the survey and therefore cannot be used in reporting the information collected. Since the survey has been completed, I will shred your address and place your survey in a pile of all other completed surveys. Again, the survey that you completed cannot be traced back to you or your household. Data will be reported as an entire tribe.

You may contact the researcher at the following email and phone number, should you desire to discuss your participation in the study and/or request information about the results of the study: Jeremy Bennett, Graduate Student, College of Agricultural Sciences & Natural Resources, Oklahoma State University, 405-822-1088, jsbenne@okstate.edu. If you have questions about your rights as a research volunteer, you may contact Dr. Shelia Kennison, IRB Chair, 219 Cordell North, Stillwater, OK 74078, 405-744-3377 or irb@okstate.edu.

Again, thank you very much for participating in my graduate research.

Sincerely,



Jeremy Bennett
Graduate Assistant
Master of Science in Agricultural Economics
College of Agricultural Sciences and Natural Resources
103G Agricultural Hall
Stillwater, OK 74078-6017

C: 405-822-1088
O: 405-744-9539

Okla. State Univ.
IRB
Approved <u>11/27/12</u>
Expires <u>11/26/13</u>
IRB # <u>12-12-58</u>

APPENDIX C

Approval from Citizen Potawatomi Nation

CHAIRMAN
John A. Barrett
VICE CHAIRMAN
Linda Capps
SECRETARY-TREASURER
D. Wayne Trousdale



Jbarrett@potawatomi.org
Lcapps@potawatomi.org
Dtrosdale@potawatomi.org

CITIZEN POTAWATOMI NATION

November 19, 2012

Jeremy Bennett
Graduate Assistant, Student Development
Student Success Center College of Agricultural Sciences and Natural Resources
103G Agricultural Hall
Stillwater, OK 74078-6017


Dear Jeremy:

This letter is to inform you that you have approval from the Citizen Potawatomi Nation (CPN) Administration and you also have my approval as a CPN elected official to conduct a survey and form a focus group in regards to tribal food security.

We are pleased to assist you with your graduate research and we look forward to our initial focus group meeting shortly after the Thanksgiving holiday.

If you need to contact me for any reason prior to our first meeting, please feel free to do so.

Sincerely,


Linda Capps
Vice Chairman
CITIZEN POTAWATOMI NATION
405-275-3121 office
405-650-1238 cell
405-275-0198 fax

APPENDIX D

Modification Approval of Institutional Review Board (IRB)

Oklahoma State University Institutional Review Board

Date: Tuesday, January 08, 2013 Protocol Expires: 11/26/2013
IRB Application No: AG1258
Proposal Title: Oklahoma Tribal Food Security Outlook

Reviewed and Processed as: Exempt
Modification

Status Recommended by Reviewer(s) Approved

Principal Investigator(s):

Jody Campiche 528 Ag Hall Stillwater, OK 74078
Jeremy Bennett 103 Ag Hall Stillwater, OK 74078

The requested modification to this IRB protocol has been approved. Please note that the original expiration date of the protocol has not changed. The IRB office MUST be notified in writing when a project is complete. All approved projects are subject to monitoring by the IRB.

[X] The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

The reviewer(s) had these comments:

Change to add \$10 gift cards provided to investigator by Citizen Potawatomi Nation, notice of upcoming visit by PI to household sent by tribe, and addition of demographic question to survey.

Signature :

Handwritten signature of Shelia M. Kennison

Shelia Kennison, Chair, Institutional Review Board

Tuesday, January 08, 2013
Date

APPENDIX E

Pre-Survey Letter to CPN Households



Dear tribal members,

As you may know, the Citizen Potawatomi Nation (CPN) is extremely proud to award scholarships and other financial needs to students that are pursuing a higher education. We are always eager to work with students pursuing any degree, but when students are specifically studying Native American issues, we are honored that they are seeking and preserving their cultural heritage. Very rarely do we have college students studying the CPN.

Jeremy Bennett, a Citizen Potawatomi Nation member and a graduate student at Oklahoma State University (OSU), has chosen to research Native American household food security levels amongst CPN households. To clarify, food security means access by all people at all times to enough food for an active, healthy life. The Nation's administration has been working with Mr. Bennett through every phase and design of this research project. We have given him permission to survey the tribe. Our administration has only provided him with a randomly selected group of addresses. Your address was one that was randomly chosen. Names and other personal information were not given out, nor will be asked during the survey. Mr. Bennett will start his survey in January by coming around knocking on doors asking for households to participate in his research. The survey is completely voluntary and anonymous. The survey will take approximately 5-8 minutes.

Because the CPN believes in higher education and Native American health, the Nation's administration is going to present households that participate in Mr. Bennett's research with a CPN gift card. It is mine and Jeremy's hope that every household will participate in his research.

If you have any questions or concerns, please feel free to call Citizen Potawatomi Nation Vice-Chairman Linda Capps at (405)-275-3121 or Jeremy Bennett at (405)-744-9539.

Sincerely,

Linda Capps
Vice-Chairman, Citizen Potawatomi Nation

Jeremy Bennett
Graduate Student, OSU



APPENDIX F

CPN Questionnaire of Household Characteristics

TRIBAL FOOD SECURITY CHARACTERISTICS SURVEY
DRAFT

Page 1 of 5

Survey Date: January - February 2013

NOTE TO INTERVIEWER: All questions are optional and respondent may, of course, choose not to answer. All answers provided on this form are for facilitation purposes only. If an answer does not "fit" into one of the provided answers, please take down the exact answer given.

Introduction and screener:

Hello. My name is Jeremy Bennett with Oklahoma State University. I am also a member of the Citizen Potawatomi Nation of Shawnee, Oklahoma. I am here on behalf of my graduate research. I would like your opinion on a brief survey that is centered on tribal household food security and food assistance programs. The survey will take approximately 5-8 minutes. Your tribe has randomly selected your address for this survey. No names, or other personal information, was given and will not be asked or used at any point in this research. To ensure confidentiality, all responses are completely anonymous. You have the option to refuse some or all questions. As a small token of my appreciation and for completing the survey, I would like to give you a \$10 gift card at the conclusion of the survey. Remember, this brief survey is strictly voluntary. By allowing me to continue with the survey, you are giving me verbal permission or consent to conduct the survey.

Qualifier 1: May I ask, are you over the age of 18?

- Yes
- No (*Ask to speak to someone over the age of 18. TERMINATE if there is no one over the age of 18 in the household.*)

1. Which tribe do you affiliate with?

- Citizen Potawatomi Nation
- Iowa Tribe of Perkins
- Other _____ (*TERMINATE*)

The next questions that I am going to ask are about the food eaten in your household in the last 12 months, since (current month) of last year and whether you were able to afford the food you need.

(SWITCH to the U.S. Household Food Security Survey Module, start with Question HH2)

We are already half way through. The final questions that I am going to ask are about specific characteristics regarding your household and food assistance programs.

2. What is the main reason for living at your current location?
- Always lived there
 - Educational purposes
 - Employment opportunities
 - Has cultural significance
 - Near family
 - Other (*Specify*) _____
 - (*Do not read*) Don't know/Refused
- 3a. Have you thought about moving to another location?
- Yes
 - No (*Skip to Q4*)
 - (*Do not read*) Don't know/Refused
- 3b. What is your reason for wanting to move to another location?
- Closer to family members
 - Employment opportunities
 - Educational purposes
 - Health reasons
 - Other (*Specify*) _____
 - (*Do not read*) Don't know/Refused
4. What is the highest level of education you have completed?
- | | |
|---|--|
| <input type="checkbox"/> Grade School (1st grade to 8th grade) | <input type="checkbox"/> Graduate or Professional School |
| <input type="checkbox"/> High School (9th-12th grade, but not Diploma) | |
| <input type="checkbox"/> High School (9th-12th grade, obtained Diploma) | |
| <input type="checkbox"/> Higher Education (some college) | <input type="checkbox"/> Never Attended |
| <input type="checkbox"/> Higher Education (college degree) | <input type="checkbox"/> Other (<i>Specify</i>) _____ |
| | <input type="checkbox"/> (<i>Do not read</i>) Don't know/Refused |
5. What was the main reason for not continuing your education?
- | | |
|--|--|
| <input type="checkbox"/> Bad or poor location | <input type="checkbox"/> Pregnant |
| <input type="checkbox"/> Financial difficulties | <input type="checkbox"/> Suspended |
| <input type="checkbox"/> Found employment | <input type="checkbox"/> Transportation issues |
| <input type="checkbox"/> Personal issue | <input type="checkbox"/> Other (<i>Specify</i>) _____ |
| <input type="checkbox"/> Personally saw no reason for school | <input type="checkbox"/> (<i>Do not read</i>) Don't know/Refused |
- 6a. Do you have children under the age of 18 that currently live in the household?
- Yes
 - No (*Skip to Q.7*)
 - (*Do not read*) Don't know/Refused

- 6b. Are the children enrolled in school?
- Yes (**Skip to Q.6d**)
 - No
 - (**Do not read**) Don't know/Refused
- 6c. What is the main reason for the children not being enrolled in school?
- | | |
|--|--|
| <input type="checkbox"/> Bad or poor location | <input type="checkbox"/> Pregnant |
| <input type="checkbox"/> Financial difficulties | <input type="checkbox"/> Suspended |
| <input type="checkbox"/> Found employment | <input type="checkbox"/> Transportation issues |
| <input type="checkbox"/> Personal issue | <input type="checkbox"/> Other (<i>Specify</i>) _____ |
| <input type="checkbox"/> Personally saw no reason for school | <input type="checkbox"/> (Do not read) Don't know/Refused |
- 6d. Do your children participate in a school lunch or breakfast assistance program?
- Yes
 - No (**Skip to Q.7**)
 - (**Do not read**) Don't know/Refused
- 6e. Which school-based food assistance program(s) do your children participate in?
- Head Start
 - National School Lunch Program
 - School Breakfast Program
 - Other (*Specify*) _____
 - (**Do not read**) Don't know/Refused
- 6f. How did you find out about school-based food assistance program(s)?
- Family/Friends/Neighbors
 - Tribe
 - TV/Radio/Internet
 - Other (*Specify*) _____
 - (**Do not read**) Don't know/Refused
- 6g. Were there any challenges to the enrollment process for the school-based food assistance program(s)?
- Yes
 - No (**Skip to Q.7**)
 - (**Do not read**) Don't know/Refused

- 6h. In your opinion, what was the main challenge in the enrollment process for school-based food assistance program(s)?
- Lacked guidance
 - Requirements too difficult or challenging
 - Was not aware of such programs
 - Other (*Specify*) _____
 - (*Do not read*) Don't know/Refused
- 7a. Are you currently employed?
- Yes (**Skip to Q8**)
 - No
 - (*Do not read*) Don't know/Refused
- 7b. In your opinion, what is the main reason for being unemployed?
- | | |
|---|---|
| <input checked="" type="checkbox"/> Laid off | <input checked="" type="checkbox"/> Geographical constraints (location) |
| <input checked="" type="checkbox"/> Attending school | <input checked="" type="checkbox"/> Tending to family matters |
| <input checked="" type="checkbox"/> Lacked an educational requirement | <input checked="" type="checkbox"/> Retired (Skip to Q.10) |
| <input checked="" type="checkbox"/> Health reason/ disabled | <input checked="" type="checkbox"/> Other (<i>Specify</i>) _____ |
| <input checked="" type="checkbox"/> Lacked transportation | <input checked="" type="checkbox"/> (<i>Do not read</i>) Don't know/Refused |
8. During the past 5 years, you have spent more time?
- Employed
 - Unemployed
 - (*Do not read*) Don't know/Refused
9. During the past 5 years, has your income increased or decreased?
- Increased
 - Decreased
 - (*Do not read*) Don't know/Refused
10. What is your total household income level? (This would include you, your spouse, and any children that are currently employed.)
- | | |
|--|---|
| <input checked="" type="checkbox"/> Less than \$10,000 | <input checked="" type="checkbox"/> \$75,000 to \$99,999 |
| <input checked="" type="checkbox"/> \$10,000 to \$19,999 | <input checked="" type="checkbox"/> \$100,000 to \$124,999 |
| <input checked="" type="checkbox"/> \$20,000 to \$29,999 | <input checked="" type="checkbox"/> \$125,000 to \$149,999 |
| <input checked="" type="checkbox"/> \$30,000 to \$39,999 | <input checked="" type="checkbox"/> \$150,000 to \$199,999 |
| <input checked="" type="checkbox"/> \$40,000 to \$49,999 | <input checked="" type="checkbox"/> \$200,000 or more |
| <input checked="" type="checkbox"/> \$50,000 to \$59,999 | <input checked="" type="checkbox"/> (<i>Do not read</i>) Don't know/Refused |
| <input checked="" type="checkbox"/> \$60,000 to \$74,999 | |

11a. Does your household participate in any government or tribal food assistance program(s)?

- Yes
- No (**Skip to the End**)
- (*Do not read*) Don't know/Refused

11b. Which governmental or tribal food assistance program(s) does your household participate in?

- CACFP- Child & Adult Care Food Program
- Elderly Nutrition Program
- FDPIR- Food Distribution Program on Indian Reservations
- SNAP- Supplemental Nutrition Assistance Program (Food Stamps)
- WIC- Women, Infants, and Children
- Other (*Specify*) _____
- (*Do not read*) Don't know/Refused

11c. How did you find out about governmental or tribal food assistance program(s)?

- Family/Friends/Neighbors
- Tribe
- TV/Radio/Internet
- Other (*Specify*) _____
- (*Do not read*) Don't know/Refused

11d. Were there any challenges to the enrollment process for the governmental or tribal food assistance program(s)?

- Yes
- No (**Skip to the End**)
- (*Do not read*) Don't know/Refused

11e. In your opinion, what was the main challenge in the enrollment process for governmental or tribal food assistance program(s)?

- Lacked guidance
- Requirements too difficult or challenging
- Was not aware of such programs
- Other (*Specify*) _____
- (*Do not read*) Don't know/Refused

12. **INTERVIEWER: RECORD ANSWER BASED ON OBSERVATION ONLY. DO NOT ASK.**

- Male
- Female

That completes the survey. Thank you for your time!

VITA

Jeremy Bennett

Candidate for the Degree of

Master of Science

Thesis: AN EXAMINATION OF NATIVE AMERICAN HOUSEHOLD FOOD
SECURITY IN OKLAHOMA

Major Field: Agricultural Economics

Biographical:

Education:

Completed the requirements for the Master of Science in Agricultural
Economics at Oklahoma State University, Stillwater, Oklahoma in May, 2013.

Completed the requirements for the Bachelor of Science in Environmental
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Experience:

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Agricultural and Applied Economic Association, January 2012 – present.