

COMPARISON OF SHOPPING AND PURCHASING
PREFERANCES AT FARMERS' MARKETS THAT
ACCEPT SNAP EBT CARDS AND FARMERS'
MARKETS THAT DO NOT IN OKLAHOMA

By

CLAIRE GRADY

Bachelor of Science in Nutritional Sciences

Oklahoma State University

Stillwater, Oklahoma

2011

Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
MASTER OF SCIENCE
July, 2011

COMPARISON OF SHOPPING AND PURCHASING
PREFERANCES AT FARMERS' MARKETS THAT
ACCEPT SNAP EBT CARDS AND FARMERS'
MARKETS THAT DO NOT IN OKLAHOMA

Thesis Approved:

Dr. Barbara Brown

Thesis Adviser

Dr. Deana Hildebrand

Dr. Stephany Parker

Dr. Mark E. Payton

Dean of the Graduate College

ACKNOWLEDGMENTS

I would like to express my sincere appreciation to my chair, Dr. Barbara Brown, for all of her guidance and support throughout this entire journey. She is a wonderful mentor, and has taught me so much. I would also like to thank my committee members, Dr. Deana Hildebrand and Dr. Stephany Parker, for their guidance and constant willingness to help. Lastly, though not on my committee, I would like to thank Dr. Janice Hermann for her help and guidance with the statistical analysis of this study.

I would like to thank the Stillwater Farmers' Market, and the Cherry Street Farmers' Market for allowing me to conduct my research, and making this study possible. I also would like to thank all of the participants of this study for taking time out of their day to fill out my survey.

To my parents, Jon and Susan, thank you for always being a continual love and support system, and for instilling in me the confidence to accomplish whatever I set my mind to. I cannot think of a single time you both were not there cheering me on in whatever I was doing. I look forward to what the next chapter of my life brings. To my sisters, my best friends, Melissa and Anna, thank you for constantly making me laugh, and for reminding me that life is too short to not enjoy every moment.

Lastly, I would like to thank my Thomas. Thank you for always being there with patience, support, and encouragement. I am so blessed to have you in my life. Thank you for always pushing me to be the best I can be in everything I do, and for making me happy every day.

TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION.....	1
Purpose.....	2
Specific Aims.....	2
Null Hypotheses.....	3
Limitations of Study	4
Definitions of Terms.....	4
II. REVIEW OF LITERATURE.....	7
Health Benefits of Fruits and Vegetables	7
Barriers of Fruit and Vegetable Consumption and Purchasing	11
Consumer Demographics and Preferences of Farmers' Markets in the US	13
Overview of Fruit and Vegetable Industry in the US	15
Conventional vs. Organic Produce	16
Farmers' Markets in Oklahoma	18
SNAP Program and Farmers' Markets	19
III. METHODOLOGY	22
Description of Participants.....	22
Study Design.....	22
Description of Data Collection	22
Description of Survey	23
Statistical Analysis.....	24

Chapter	Page
IV. RESULTS	26
Participant Demographics	26
Governmental Assistance Findings	28
Shopping Preference Findings	30
Factors That Influence Farmers' Market Purchasing.....	36
V. DISCUSSION, SUMMARY, & CONCLUSION.....	39
Discussion	39
Summary	42
Conclusion	43
Recommendations	44
Implication for Future Research	44
REFERENCES	45
APPENDICES	56
APPENDIX A: OSU Institutional Review Board Approval	57
APPENDIX B: Informed Consent Script	59
APPENDIX C: Participant Informed Consent Form	61
APPENDIX D: Survey Instrument	63

LIST OF TABLES

Table	Page
Table 1: Gender demographics of shoppers at each market	27
Table 2: Age, population, and income demographics of shoppers at each market.....	28
Table 3: Results of survey questions regarding government food assistance	29
Table 4: Frequencies of fresh fruit and vegetable purchases	30
Table 5: Primary shopper of household, and knowledge of preparing fresh fruits and vegetables.....	31
Table 6: Where shoppers purchase their fresh fruits and vegetables.....	33
Table 7: Considerations shoppers make when purchasing fruits and vegetables	34
Table 8: Type of fruits and vegetables shoppers prefer	35
Table 9: Price difference shoppers would pay for organic produce over conventionally grown produce	35
Table 10: Reasons participants shop at farmers' markets	37
Table 11: Reasons participants do not shop at farmers' markets more often	38

LIST OF FIGURES

Figure	Page
Figure 1: Obesity and Diabetes Trends by State in the US.....	10
Figure 2: Metropolitan, and Non-Metropolitan Counties in Oklahoma	12
Figure 3: 2010 Food Guide Pyramid	17

CHAPTER I

INTRODUCTION

Oklahoma adults need to improve their health, and can do so through increasing their intake of fresh fruit and vegetables. This is evidenced by the increase incidence of obesity, and co-morbidities such as cardiovascular disease and type 2 diabetes mellitus ^{1,2}. Reports state that Oklahomans do not consume the recommended daily amounts of fruits and vegetables, indicated by the states rank of 50 of 50 in the United States for fruit and vegetable consumption ³. Farmers' markets provide an excellent outlet for purchasing fresh produce, and could be a resource for individuals to increase daily intake of fresh fruits and vegetables ⁴.

Another issue facing Oklahoma is the increasing number of individuals participating in the Supplemental Nutrition Assistance Program (SNAP), formerly known as Food Stamps. In November 2010 the program provided food assistance to 613,941 Oklahomans, an increase of 45% since March 2008. This indicates that many Oklahoma citizens are relying on SNAP benefits to purchase food for their households. In the past decade, farmers' markets began accepting SNAP benefits for purchases at the market. As of 2011, Oklahoma has 32 certified farmers' markets, but of those, only 13 accept SNAP benefits ⁵. In investigating shoppers at markets that accept SNAP benefits, and shoppers at markets that do not accept SNAP benefits, we can gain insight in the preferences and considerations made while at the farmers' market, and

whether or not fresh fruit and vegetable consumption is affected by SNAP acceptance at farmers' markets.

The questionnaire created for and utilized in this study investigated several aspects of two types of farmers' markets; one a market that accepted SNAP benefits, and the other a market that did not accept SNAP benefits. The survey assessed the demographics of shoppers at each market, whether or not the shopper participated in a governmental food assistance program, and the preferences and considerations shoppers made while purchasing fresh produce at farmers' markets.

Purpose

The purpose of the study was to compare and contrast preferences and considerations of shoppers at a farmers' market that accepted SNAP Electronic Benefit Transfer (EBT) benefits to the preferences and considerations of shoppers at a farmers' market that did not accept SNAP EBT benefits, and to determine if consumption of fresh fruits and vegetables was effected based upon market type.

Specific Aims

Specific Aim 1: Identify the demographics (age, sex, population, income) of shoppers at farmers' markets in Oklahoma.

Specific Aim 2: Determine factors that influence decisions made while purchasing fresh fruits and vegetables.

Specific Aim 3: Determine factors that encourage as well as factors that deter people from shopping at farmers' markets.

Specific Aim 4: Identify where shoppers purchase fresh fruits and vegetables most often.

Specific Aim 5: Identify if shoppers considered organic or conventionally grown production methods when purchase decisions were made for fresh fruits and vegetables. Additionally, if organic produce was preferred, how price related to the purchasing decision.

Specific Aim 6: Identify similarities and differences between shopping preferences at farmers' markets that accepted SNAP EBT cards and markets that did not.

Specific Aim 7: Determine if shoppers who participated in SNAP consumed more fresh fruits and vegetables when they could use SNAP EBT at their local farmers' market than those shoppers who could not use SNAP EBT at their local market. Additionally, determine if the shoppers who could not use the SNAP EBT at their local market would consume more fresh fruits and vegetables if they could use SNAP EBT.

Null Hypotheses

Ho1: There will be no difference in the demographics between shoppers at the two farmers' markets.

Ho2: There will be no differences in factors considered during purchase of fresh fruits and vegetables between shoppers at the two farmers' markets.

Ho3: There will be no differences where fresh fruits and vegetables are purchased most often between shoppers at the two markets.

Ho4: There will be no difference in the self-described consumption of fresh fruits and vegetables between shoppers who could use SNAP EBT at their local farmers' market and shoppers who could not.

Limitations of the Study

1. The difference in city size in square miles, and population between the two farmers' markets used in this study.
2. The season in which surveys were administered was not the peak season for some popular fresh fruit and vegetable items grown and sold in Oklahoma.
3. The sample was a convenience sample, and may not be a complete representation of the entire population.
4. The small sample size of the study may not draw an accurate representation of the entire population.
5. While surveying shoppers at each market, there was no way to identify SNAP EBT users against non-SNAP EBT users. This accounts for the low number of surveyed individuals who participated in SNAP.

Definitions of Terms

1. Organic Production: A production system that is managed in accordance with the Organic Foods Production Act of 1990, and regulations in this part to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity ⁶.

2. Conventional Production: Agricultural products that are produced using the conventional methods ⁷.
3. Fresh: Food that is not preserved by canning, dehydration, freezing, or smoking. Food in its natural state ⁸.
4. Local: A term used to describe food that is grown within a certain distance from which it is sold. In Oklahoma, local food is defined as food grown in the immediate county you are in, and any adjoining county ⁹.
5. Farmers' Market: A term used to describe markets that support local farmers, and preserve farmland for the future by providing regional small family farmers with alternative opportunities to sell their fruits, vegetables, and other farm products directly to the consumer. These markets are typically held outside, in an open area ¹⁰.
6. United States Department of Agriculture (USDA): A department of the federal government which operates several agencies including Agriculture Research, Food and Nutrition, Supplemental Nutrition Assistance Program, and Food Safety and Inspection ¹¹.
7. Supplemental Nutrition Assistance Program (SNAP): A program developed by the United States Department of Agriculture, in order to provide nutrition to low income families. SNAP was previously called "Food Stamps" ¹².
8. Electronic Benefit Transfer (EBT): An electronic system that allows a recipient to authorize transfer of their government benefits from a Federal account to a retailer account to pay for products received ¹³.
9. Food Stamps: A stamp or coupon, issued by the government to persons with low incomes, which can be redeemed for food at stores. Food Stamps are now called SNAP benefits ¹².
10. Women, Infants, and Children (WIC): WIC provides Federal grants to States for supplemental foods, health care referrals, and nutrition education for low-income

pregnant, breastfeeding, and non-breastfeeding postpartum women, and to infants and children up to age five who are found to be at nutritional risk¹⁴.

11. Food Distribution Program (FDP): A federal program that provides commodity foods to low-income households, including the elderly, living on Indian reservations, and to Native American families residing in designated areas near reservations and in the State of Oklahoma¹⁵.

CHAPTER II

LITERATURE REVIEW

Health Benefits of Fresh Fruits and Vegetables

Fruits and vegetables are rich in nutrients, which have many proven health benefits. Both fruits and vegetables are excellent sources of potassium, folate, vitamin A, vitamin C, vitamin D, vitamin E, dietary fiber, and many other vitamins and minerals ^{1,2}.

Not only do fruits and vegetables provide essential nutrients, but they are low in fat and calories, which assist in weight management and lower obesity rates ¹⁶. The prevalence of obesity is rising among Americans. In fact, in 2009, no state met the Healthy People 2010 goal for obesity rates to be at or below 15% of the total state population. Instead, obesity rates increased 1.1% from 2007 to 2009 ¹⁷. The state of Oklahoma was no exception to the national trend. In 2009, the Centers for Disease Control (CDC) reported that 31.4% of Oklahoma citizens were obese. This ranked Oklahoma as number 46 out of 50 among states with the highest obesity rates, making Oklahoma the fourth most obese state in the country ¹⁸. The increased rates of obesity have been linked to increases in chronic disease ^{16,19}. Individuals who consume diets rich in fruits and vegetables have been shown to have lower incidences of obesity. This is due in part to the high fiber and water content of produce, which is thought to decrease calorie intake, and therefore, body weight ²⁰. A study conducted by Tanumihardjo et al., found that increasing daily fruit and vegetable intake might be associated with weight loss due to decreased calorie intake

while increasing satiety²¹.

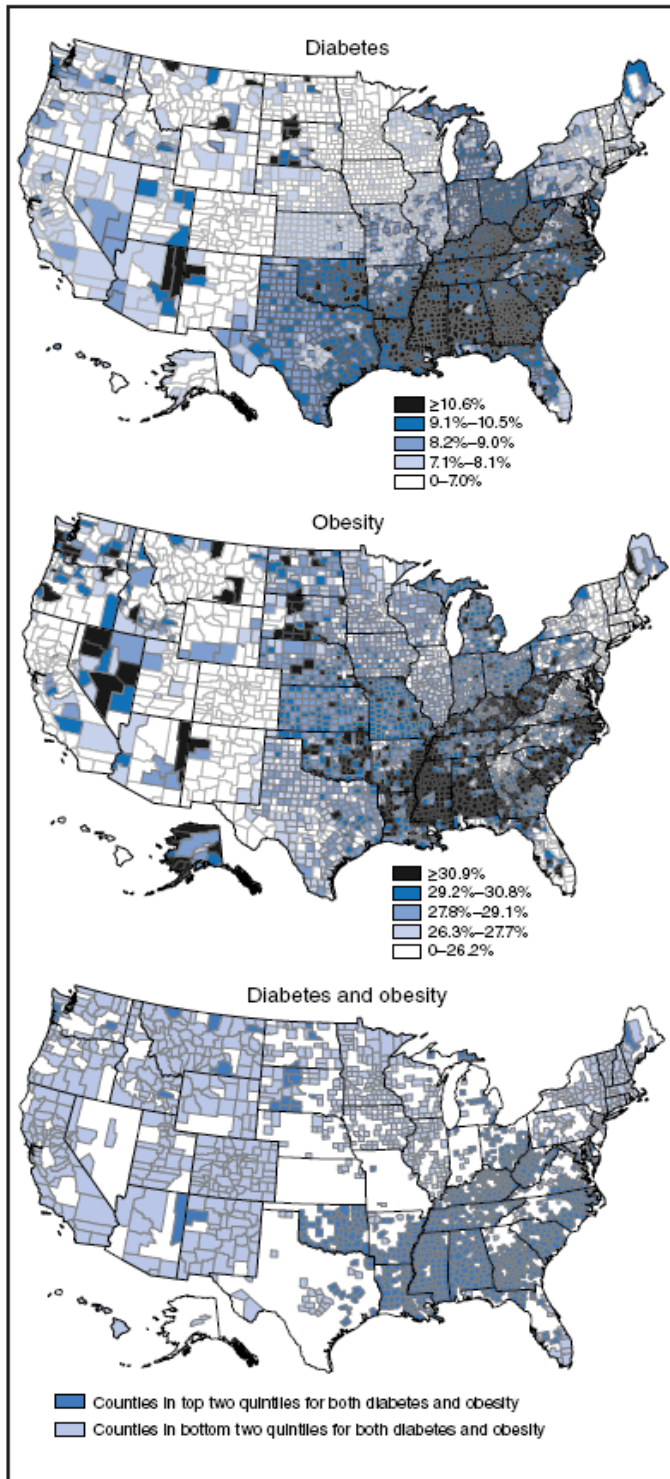
Some vitamins and other nutrients found in fruits and vegetables have been shown to reduce rates of chronic disease. Vitamin C and vitamin E act as antioxidants, which destroy free radicals, and therefore help decrease cancer rates²². Both vitamin C and vitamin E aid in increasing apoptosis of cancer cells, which in turn is thought to decrease the proliferation of mutated cells²². In addition to having antioxidant properties, fruits and vegetables are low in cholesterol, and high in non-digestible fiber, which is beneficial for lowering the risk of chronic heart disease^{20, 23}. The soluble fiber found in fruits and vegetables has been found to lower blood pressure, and improve lipid profiles²⁰.

The nutrient profiles of fruits and vegetables help guard against type 2 diabetes. Diabetes is a chronic disease associated with increased incidence of end stage renal disease, cardiovascular disease, amputations, eye problems, and death. It is responsible for \$491.8 billion in medical costs nationally, and \$1.8 billion in medical costs in Oklahoma²⁴. The incidence of type 2 diabetes is rapidly increasing in the United States, with 25.8 million Americans currently diagnosed in 2010²⁵. In 2006, an estimated 15.6% of Oklahoma citizens were reported to have diabetes, a 43% increase since 1990. Specific to this study, Payne County and Tulsa County, the locations of the two farmers' markets where surveys were conducted, has 9.4% and 9.6% of adults diagnosed with diabetes respectively²⁶. The Centers for Disease Control has predicted that one in three, to one in five Americans will have type 2 diabetes by 2050²⁷. A cohort study conducted by Hodge et al., found that over the course of four years, there was an increased risk of diabetes associated with diets high in meats and fatty foods, and a lowered risk of diabetes associated with diets high in cooked vegetables²⁸.

In 2011, the recommendation for fruits and vegetables, as suggested by the United States Department of Agriculture (USDA), is a combined daily minimum of two cups fruit, and two and

a half cups vegetables for those consuming a 2000 kcal diet²⁹. Nationally, one in ten Americans consume the recommended servings of fruit and vegetables each day. This indicates only 6% of individuals achieve their daily-recommended servings of vegetables, and only 8% consume the daily-recommended servings of fruit³⁰. Oklahoma currently ranks 50 out of 50 in the United States for fruit and vegetable consumption, with only 16.3% of adult Oklahoma's consuming the recommended servings each day³. Specific to this study, 12.2% of adults in Payne County, and 15.4% of adults in Tulsa County reported consuming the recommended daily servings of fruits and vegetables³. With inadequate consumption of fruits and vegetables, it is likely that diets contain higher amounts of total fat, and lower amounts of total fiber, vitamins, and minerals. This contributes to a continuation in the increased incidences of type 2 diabetes mellitus, and a rise in obesity and chronic disease facing today's society³¹, (see figure 1).

Figure 1. Obesity and Diabetes Trends by State in the US



Source: Centers for Disease Control, 2007²¹.

Barriers of Fruit and Vegetable Consumption and Purchasing

Americans, including Oklahomans, face several barriers in the effort to consume the recommended number of servings of fruits and vegetables daily. These barriers include low income levels, increased food costs, limited access to fresh fruits and vegetables, and lack of awareness of the health benefits and daily recommendations of fresh fruits and vegetables.

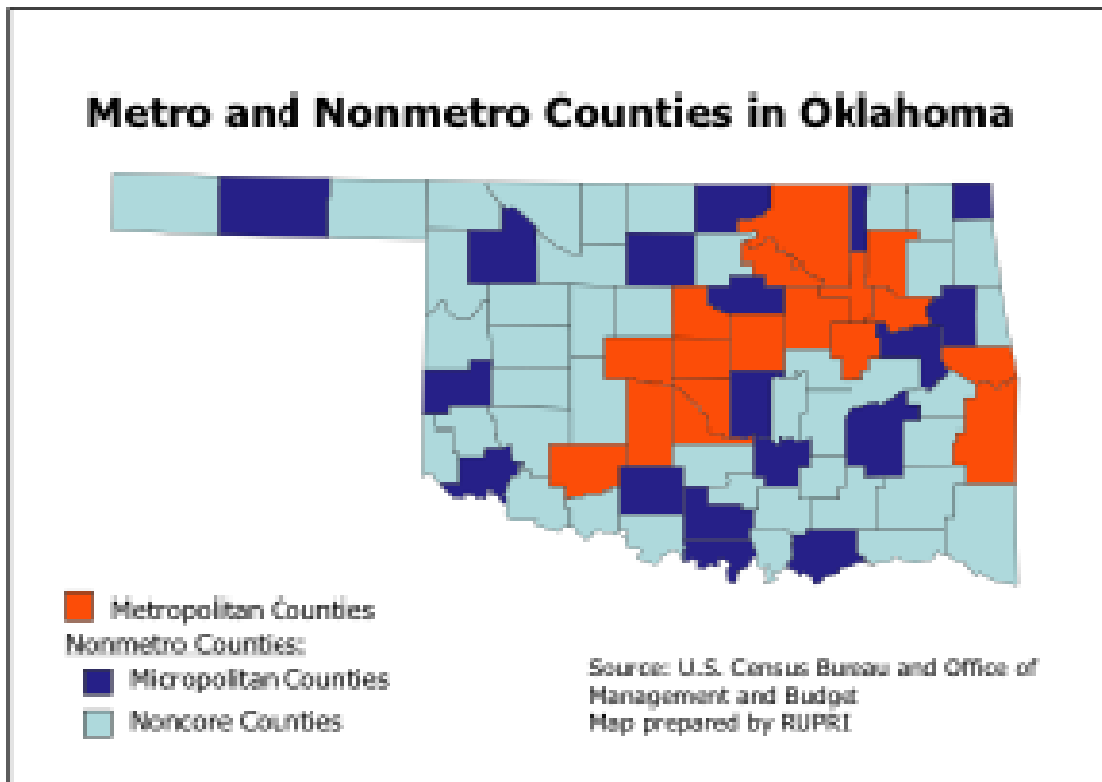
Between the years of 1999-2009, Americans have seen tremendous changes in the United States economy. This caused unemployment rates to increase, which in turn increased poverty rates due to the decrease in annual income. The median income in the United States for 2009 was \$49,777, down from \$52,388 in 1999³². In 2009, Oklahoma had a median income of \$41,857, well below the national average. In fact, Oklahoma ranked 45 out of 50 in national income rankings, making Oklahoma the fifth poorest state in the country³³. As of 2010, the national poverty rate was the highest it has been in 51 years, with 43.6 million (14.3%) Americans suffering. At that time the poverty rate in Oklahoma was 16.1%, and had increased 1.4% over the previous decade³³. With decreased income, and increased poverty levels along with increase in food prices, eating healthy is a challenge for Oklahomans.

The increase in food costs may be contributing to Oklahomans buying more foods that tend to be unhealthy and high calorie to feed their families²⁴. On average, food costs accounted for about 13% of total household spending each month³⁴. Food costs increased because crop prices increased. The trend in rising food costs was 5.8% in 2008, 4% in 2009, 3.5% in 2010, and an expected 2 to 3% in 2011³⁵. The continual rise in food cost, the increase in poverty, the decrease in income, and the increase in the number of individuals using SNAP benefits to pay for groceries posed an issue for consumers to afford healthy food options. On average, a person on SNAP received \$39.65-\$50.00 per week to spend on groceries; this amount was inadequate if the individual wanted to purchase fresh produce³⁵. Over the past three years (2008-current) the cost

of fresh fruits and vegetables increased approximately 20%. This cost increase made it difficult to purchase the recommended servings of produce while still meeting other food group recommendations each day, and therefore limited healthy eating.

Another barrier facing many Americans, including Oklahomans, is limited access to fruits and vegetables. This could have been due to lack of income, living in a rural area, limited or no access to transportation, or limited numbers of grocery stores/markets nearby. It is estimated that 13.5% of rural people face food insecurity. There was a reported 16.3% of Oklahomans living in extreme rural areas across the state, and an estimated 39% of Oklahomans living in non-metropolitan areas ³⁶ (see figure 2).

Figure 2. Metropolitan and Non-Metropolitan Counties in Oklahoma



These rural areas, with limited or no access to food are often referred to as ‘food deserts’³⁷. Those living in rural areas may have limited access to full service grocery stores and farmers’ markets, which prevents them from purchasing fruits and vegetables. The CDC states, “neighborhood residents with better access to supermarkets and other retail stores that provide healthy foods tend to have healthier diets, including higher intakes of fruits and vegetables”⁴. Regardless of whether an individual lived in a metropolitan or rural community, if he or she did not have a means of transportation they were extremely limited in their ability to access food, including produce. Low-income households and the elderly were six to seven times more likely to suffer from food insecurity due to the lack of transportation requiring them to hire a taxi, catch the bus, ride with a family member/friend, or walk to shop for grocery items^{37, 38}.

Lastly, lack of awareness of health benefits, and recommended daily servings of fruits and vegetables was an issue, which may have caused a lower consumption of fresh produce. A report, from 2008, found only 40% of Americans knew that the recommended daily servings for fruits and vegetables was five, and that a majority stated two servings was enough³⁹. A study by Wolf et al., found there was an overall lack of awareness of both health benefits and current recommendations of fruit and vegetables⁴⁰. Of the participants in the Wolf study, 59.8% were not aware that eating a colorful variety of fruits and vegetables was important. Furthermore, the researchers concluded that higher education levels were significantly associated with knowledge of benefits, and the recommend servings for fruits and vegetables⁴⁰.

Consumer Demographics and Preferences of Farmers’ Markets in the United States

Farmers’ Markets have become increasingly popular among consumers in the United States⁴¹. The number of farmers’ markets in the United States grew from 1,755 in 1994 to 6,132 in 2010; a 33% increase¹⁰. The rise in chronic health problems facing our country, the growing

trend toward healthy eating, the perceived better taste of fresh produce, and the desire to purchase local produce contributed to the dramatic increase in the number of farmers' markets in the United States⁴². The Slow Food Movement, which was introduced to the United States from Italy, has become popular. This movement has encouraged shoppers to seek safe, healthy, local, and fresh foods⁴³. This also caused an increase in consumers desire to support local farmers, and the need to understand the origin or source of their food⁴⁴.

The types of consumers that shop at farmers' markets is dependent upon the location of the market, season, items available, and the overall demographics of the near-by population. Two national studies found that consumers with varying education levels were equally likely to shop at farmers' markets^{45, 46}. However, similar national studies found that patrons at farmers' markets generally tend to be female, Caucasian, of higher income, well educated, live in a household of at least two adults, and an average of 51 years of age^{41, 44}. Similarly, studies conducted by Wolf et al., found that farmers' market consumers tended to be female, married, college educated, and fall within the \$40,000-69,999 income bracket⁴².

Individuals who shopped at farmers' markets in preference to grocery stores did so because they believed products at farmers' markets were of better value, quality, nutrition, freshness, appearance, and the shoppers generally had an interest in supporting local farmers⁴⁴. Additionally, farmers' market shoppers tended to enjoy cooking, gardening, and value mealtime in their households more than their grocery store shopping counterparts³³. Conversely, studies found that the primary reasons shoppers preferred to shop at grocery stores rather than farmers' markets was due to the inconvenient hours of operation, lack of choice in produce provided, parking problems, and far driving distances that farmers' markets often present^{41, 46}.

Overview of Fruit and Vegetable Industry in the United States

Over the past century, the farming sector in the United States has become one of the most successful in the world. This was due to perceived low food safety risks associated with produce, increased technology, marketing, growth in domestic consumption, and improved farming techniques^{47,48}. Currently, the U.S. produces over one hundred varieties of fruits and vegetables that are grown for direct consumption, or for use in processing other products such as canned, frozen, dried items, and juice⁴⁷. Despite the large variety and number of farmers, the United States has become largely an importer of fruits and vegetables. Between the years of 1994 and 2004, the amount of imports nearly doubled reaching \$12.7 billion, while exports totaled \$9.7 billion⁴⁹. The increase demand for imports can be attributed to the increased demand by the domestic consumer, the decline in value of the American dollar, seasonal growing patterns, and low tariffs of importing countries⁴⁹.

The average consumption of vegetables per person in the United States in 2008 was 393 pounds. This equates to 95 pounds of canned vegetables, 188 pounds of fresh vegetables, and 73 pounds of frozen vegetables. The remaining poundage (30 lb.) included chips, and dehydrated vegetables⁵⁰. In regards to fruit, a total of 249 pounds was consumed per person in 2008 in the United States. When broken down, this included 15 pounds of canned fruit, 127 pounds of fresh fruit, and 4 pounds of frozen fruit. The remaining poundage (103 lb.) included dried fruit and fruit juices⁵¹. The type of produce that an individual consumer chose to purchase was based upon many factors, but primarily dependent upon personal preference of the individual.

Conventional vs. Organic Produce

The two primary growing methods in the United States are conventional and organic. The difference between organic and conventional food is determined by the ways in which the food

has been produced and processed ⁵². Regardless of the method in which the food was produced, each is required to meet certain United States Department of Agriculture (USDA) standards before it can be sold to the public ⁵³.

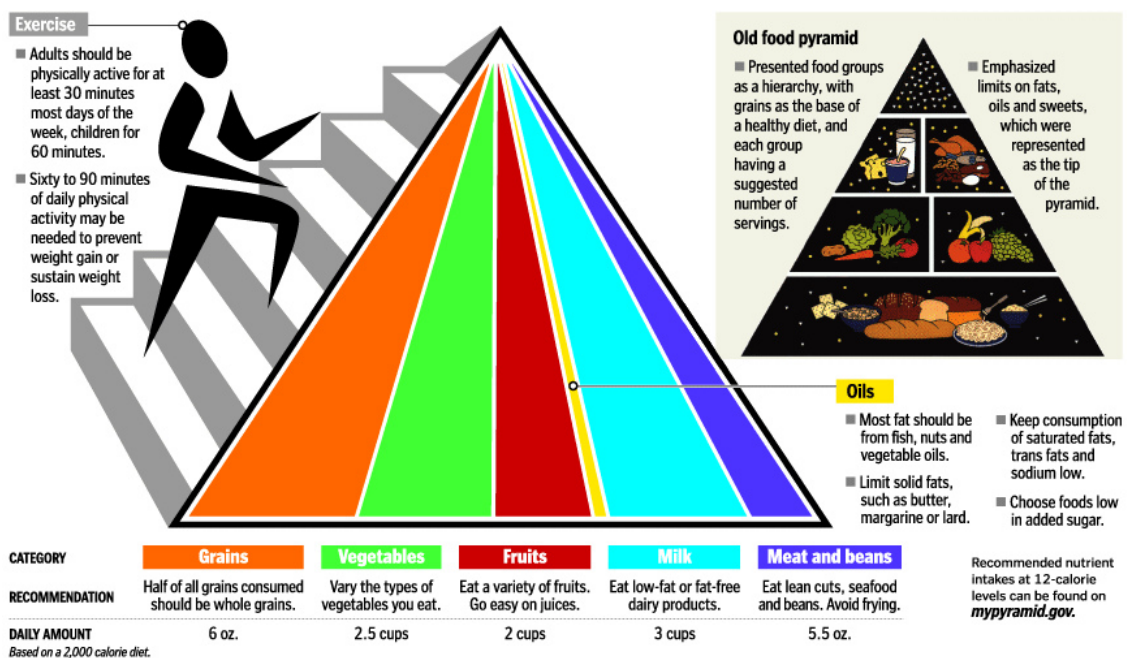
Farmers who produce food in a conventional fashion utilize chemical fertilizers to promote plant growth, whereas organic farmers will apply natural fertilizers, such as manure and compost to enrich the soil for improved growth ⁵³⁻⁵⁵. Another difference between organic and conventional farming lies in crop rotation. In order to manage weeds, conventional farmers will use chemicals such as herbicides. In comparison, organic farmers perform well-planned crop rotations to preserve the natural condition of the soil, reduce soil erosion, and to control weed overgrowth. Lastly, farmers who use conventional methods include the use of insecticides to rid plants of pests, and to reduce disease ⁵³. Farmers who apply organic techniques in their farming use beneficial insects and birds, as well as traps to rid pests and reduce the occurrence of disease. Often times in conventional food production food quality is determined by weight, nutrient content, microbial safety, color, texture, shape, and price ⁵⁵. By contrast, organic food quality examines all of the same criteria but in addition factors in social, environmental and political issues ^{53,55}.

The past decade, 2001- 2010, has seen a dramatic increase in the popularity of organic products largely due to the increase in concerns about food and environmental safety, as well as consumer perceptions of improved nutritional quality and taste ⁵⁶. A study found that 70% of consumers preferred organic produce to avoid produce treated with pesticides, 68% preferred organic due to freshness, and 67% would choose organic produce for health and nutrition concerns ⁵⁷.

Several studies have been conducted comparing health benefits of produce from organic and conventional origin. Many consumers who purchase organically grown produce do so

because they perceive it to be more nutritious and healthful⁴⁸. However, despite the many studies that sought to find micronutrient differentiation (vitamins, minerals, and trace elements) between organic and conventional produce, none have produced findings confirming organic produce contained a higher nutrient content than conventional produce^{55, 58-60}. A study conducted by Woese et al., found that organic and conventional produce had similar nutrient content, but organic produce was lower in nitrites, a common food preservative or anti-microbial agent added to foods⁶¹. Additionally, a study conducted by Mukherjee et al., found that conventional produce had lower microbial counts than organic produce, suggesting the need for increased safety concerns if organic produce was not handled properly⁶². There are many factors that influence both organic and conventional produce that cannot be controlled by production alone due to environmental and genetic factors. Regardless of how food was produced, it is currently suggested that a well-balanced diet, adequate in all food groups on the Food Pyramid (see figure 3), will promote and maintain health⁶³.

Figure 3. 2010 Food Guide Pyramid



Source: <http://www.mypyramid.gov>

The cost difference between organic and conventional produce can be substantial. Depending upon the organic food item purchased, there can be a 10% to 115% price increase when compared to the conventionally produced counterpart⁵⁶. Research has found that on average, United States consumers were willing to pay 10% to 40% more for organic foods⁶⁴. The higher price of organic foods is partly due to the amount of labor and time that goes into growing organically, as well as the marketing of the label “organic.” In 2010, the organic fruit and vegetable market was a \$9.6 billion dollar industry, and represented 38% of total organic food sales⁶⁵.

Farmers’ Markets in Oklahoma

According to the Oklahoma Department of Agriculture, there were 32 markets registered in 2011 that met all the Oklahoma Department of Health requirements, and there were thought to be more markets that were not registered. Twenty-eight of those 32 markets offered 100% Oklahoma grown products⁵. However, the USDA lists 31 markets in Oklahoma⁶⁶. Regardless of the exact number, farmers’ markets in Oklahoma were located in all areas of the state, so no matter where an individual lived he/she generally had access to a farmers’ market.

Nationally, the typical farmers’ market shopper was female, Caucasian, had a higher income, was well educated, lived in a household of at least two or more adults, and was 51 years of age or more⁴¹. There has been little research conducted that looked at the demographics of shoppers at farmers’ markets specific to Oklahoma. The Kerr Center for Sustainable Agriculture (KCSA) conducted a survey during the years of 2001 and 2002 in eleven farmers’ markets across the state of Oklahoma. The survey was administered to farmers’ market customers, market managers, and vendors (participating farmers). The demographic results of the survey found shoppers at Oklahoma farmers’ markets to be similar to national market shoppers; age 36 or

older, highly educated, household income average of \$40,000, and they typically lived in a two-person household. Additionally, the study found that 44.1% of Oklahoma market shoppers prepared meals at home more than seven times a week, similar to national statistics. Thirty-two percent of Oklahoma market shoppers, when surveyed by the KCSA, reported they visited their local farmers' market weekly, and 23% reported going every other week ⁶⁷.

SNAP Program and Farmers' Markets

The Food Stamp Program received a new title on October 1, 2008 ¹². It is now called Supplemental Nutrition Assistance Program, or more commonly SNAP. SNAP is funded by the United States government through the USDA Food and Nutrition Service (FNS). It serves to provide low-income families with food. The Food Stamp program initially started in 1939, toward the end of The Great Depression, to feed families who had been hit hard and could no longer afford food. Also, at this time the country was experiencing unmarketable food surpluses and widespread unemployment. However, the Food Stamp program ended in 1943 due to changing economic conditions when the government no longer saw a need for the program. In 1954, the idea of Food Stamps resurfaced and national studies were performed to see if there was any desire, or need for such a program. As a result of positive responses, two decades later, Congress passed the Food Stamp Act in 197 ⁶⁸. Since, several changes and regulations have been made to the program to make it what it is today.

Nationally, around 42 million Americans participate in SNAP, indicating that food insecurity is a major issue facing many individuals in the United States. It is projected that by the end of 2011, this number will rise to 43.3 million. According to the USDA, the number of individuals and families in Oklahoma using SNAP benefits has increased 40% over the past six

years. The most recent State Activity Report states that number of Oklahoma citizens utilizing the Supplemental Nutrition Assistance Program is 613,941 (as of November 2010) ⁶⁹.

In order to qualify for SNAP benefits, an individual must meet specific eligibility criteria established by the USDA which includes resources, income, and employment requirements. In regards to resources, a household must have less than \$2,000 in countable resources. In order to determine income requirements, households must meet gross, and net income tests. Regardless, a household has to fall at or below 130% of the national poverty level, and in congruence with household size. For example, a household of one person can make no more than \$1,174 a month, compared to a household of five that can make no more than \$2,794 combined income a month. Employment is an additional criterion that must be met when qualifying for SNAP benefits. Adults are required to register for work, accept suitable employment, and take part in an employment-training program. If these requirements are not met, SNAP benefits will be revoked. Considering that a household met all the criteria, the amount of SNAP benefits issued was determined by the number of people living in a household. A household of one person received \$200 (\$50/week) per month in SNAP benefits, whereas a household of five received \$793 (\$39.65/week/person) per month in SNAP benefits ⁷⁰.

The way in which SNAP benefits are administered differs from the way Food Stamps were issued. SNAP benefits are administered through a system called Electronic Benefit Transfer, or EBT ¹³. This system allows SNAP benefits to be issued electronically; very similar to the way a debit card works. Each month, the funds are automatically transferred into an individual's/household's account. Each EBT user creates an individual PIN number, and as the card is swiped when food items are purchased throughout the month with the EBT card, the PIN is entered, and the amount spent is deducted from the account. This system improves quality, decreases fraud, and loopholes that occurred with the food stamp system. EBT card users do not

have to worry about losing paper vouchers, and are with provided a more private and discrete way to use benefits ⁷¹.

Across the nation, the number of farmers' markets that accept SNAP benefits in the form of EBT is increasing. In 2009, an estimated 946 farmers' markets participated in SNAP in the United States. The total value of SNAP redemptions from farmers' markets in the 2009 fiscal year doubled from 2008 to \$4 million. As of September 1, 2010 there were 13 markets in Oklahoma that accepted SNAP EBT, which allowed individuals participating in the SNAP to apply their benefits towards purchasing foods at farmers' markets. These markets were located in Tulsa (Cherry Street, Pearl, Brookside), Sayre, Owasso, Mangum, Muskogee, Tahlequah, Stillwell, Midwest/Del City, Shawnee, Oklahoma City (Women in Agriculture), and Norman ⁷².

For a market to participate in SNAP, it must first become licensed. It is the farmers' market's responsibility to purchase a point of sales (POS) device to make EBT transactions ⁷³. When a SNAP participant chooses to purchase food items from their local market, they go to the market manager's booth to make a transaction of their preferred amount using their EBT card. In return for the EBT transaction, the SNAP participant is allotted tokens designed for that specific market to spend at the individual vendors booths within the market. Upon market closing, the vendors take the tokens to the market manager who then trades them for cash payment. The EBT system allows vendors to register SNAP specific foods in their system, which qualifies the food to be applied for purchase using these benefits. This way items at markets that do not qualify (i.e. soap, lotion, crafts, flowers, etc.) to be purchased with the use SNAP benefits will be filtered out. This further helps eliminate confusion and false purchases for both the vender and the EBT cardholder ⁷⁴.

CHAPTER III

METHODOLOGY

Description of Participants

The sample for this study was a convenience sample selected from individuals shopping at two farmers' markets in Oklahoma. A total of 60 surveys were conducted, 30 at each market. The Stillwater Farmers' Market, which did not accept SNAP benefits, served as one location from which data was collected from 11 males, and 19 females. The Cherry Street Farmers' Market in Tulsa, which does accept SNAP benefits, served as the second location from which data was collected from 19 males, and 11 females. A total of 30 males and 30 females participated in this study.

Study Design

This study was a quantitative, cross-sectional design utilizing a survey that targeted shoppers at two types of farmers' markets in the state of Oklahoma.

Description of Data Collection

Prior to administering surveys to participants, two farmers' markets were selected

within Oklahoma. The markets decided upon were the Stillwater Farmers' Market in Stillwater, Oklahoma, which did not accept SNAP benefits, and the Cherry Street Farmers' Market in Tulsa, which did accept SNAP benefits. Once the markets were selected, permission to survey market shoppers was sought from the market directors at each respective market prior to administering surveys.

The same data collection protocol was used at each market. The researcher attended each market five times (10 total combined visits) during the months of August and September 2010, alternating attendance between the two markets on Wednesdays and Saturdays (the two days of the week both markets were open and operating). The survey was administered within the market to shoppers. Prior to beginning this study, procedures and documents were reviewed, and approved by the Oklahoma State Institutional Review Board (Appendix A). The participant was greeted with the reciting of a script (Appendix B). If the shopper agreed to participate, they were then handed an informed consent form (Appendix C), which they were asked to read prior to filling out the survey, and could take home with them afterwards. The survey, located in Appendix D, was filled out on site by the participant, collected, and stored until used for analysis. If desired, participants could ask questions while completing the survey.

Description of Survey

The survey was developed by Claire Grady and Barbara Brown, and was approved by the Oklahoma State Institutional Review Board for Human Subjects. The IRB approval is included in Appendix A.

The survey, available in Appendix D, contained three sections. The first section assessed the demographics of the participant in terms of gender, age, population of the community in which he or she lived, and income. The second portion of the survey asked if the participant took

part in a governmental food assistance program (Women, Infants and Children (WIC), SNAP, Food Distribution Program (FDP), or other). It is important to note that though the survey contains answer selection options for WIC, FDP, and other, this study is looking specifically at SNAP. The third section assessed specific preferences and considerations made while at the market that factor into purchase decisions made while shopping for fresh fruits and vegetables. Additionally, the third section looked specifically at the utilization of farmers' markets, and preference for organic versus conventionally grown produce. Survey questions 6, 8, 10, 11, 14, and 15 allowed participants to fill in their own response if desired.

Statistical Analysis

Each market was given a numerical code. The Stillwater Farmers' Market, which did not accept SNAP benefits, was coded 1. The Cherry Street Farmers' Market in Tulsa, which accepted SNAP benefits, was coded 2. Each question on the survey was labeled according to its question number on the survey. On questions in which participants were asked to *select one response choice*, the question responses were coded with a numerical value only. For example *Question 1*, about "Gender", was coded 1, and its response choice "Male" was coded 1, and "Female" coded 2. If the *select one response choice* questions had more than 2 answer choices, the choices were coded 3, 4, 5 and so on. However, in questions where participants were asked to *select all that apply*, the question was labeled with a numerical value according to question number within the survey, and then each response choice was given a letter, which then made each response choice its own question. If that response choice was selected, it would be given a code of 1 meaning YES, and if it was not selected it was given a code of 2 meaning NO. For example, *Question 10*, about primary sources of fresh fruits and vegetables, was coded 10-A through 10-N. If the participant select 10-A, 10-D, and 10-F each of those were then coded with 1 meaning 'YES'

they were selected, and all of the other responses were coded 2 meaning 'NO' they were not selected. Questions that did not receive a response, or questions in which the participant did not follow the directions were discarded, and not used for analyses of results. All of the coded responses were taken directly from the surveys, recorded in a Microsoft Excel spread sheet, and utilized for analysis.

The surveys were analyzed using two different methods. The first method analyzed the surveys by group based on code of market type by determining frequencies for each question. Frequency statistics were used to identify a percentage for each response, which represented the number of times an answer was chosen for each question within the survey at each respective market. In the second method, survey results from each type of market were combined and analyzed together using Chi-square's for each question. A Chi-square analysis was used to evaluate the responses chosen by the participants at each of the two markets to determine if any of the questions had significantly different choices selected based on market type.

Data were analyzed by performing Frequency and Chi-square analyses using PC Statistical Analysis System (SAS), Version 9.1 for Windows (SAS Institute, Cary, NC). The significance level for all analyses was set at $p \leq 0.05$.

CHAPTER IV

RESULTS

Surveys were administered to patrons shopping at two farmers' markets in Oklahoma. Sixty participants took part in this study, 30 from each respective market. The two markets observed were the Cherry Street Farmers' Market in Tulsa, and the Stillwater Farmers' Market in Stillwater. These two markets were chosen because the Cherry Street Farmers' Market accepts Supplemental Nutrition Assistance Program (SNAP) Electronic Benefit Transfer (EBT) benefits, and the Stillwater Farmers' Market does not accept SNAP EBT benefits. The surveys were administered and collected between the months of August and October 2010.

Participant Demographics

Demographic characteristics of the participants including gender, age, population, and income can be observed in Tables 1 and 2. Of the 30 participants surveyed at the Cherry Street Farmers' Market, 19 were male (63%), and 11 were female (37%). At the Stillwater Market, out of the 30 participants surveyed, 11 participants were male (37%), and 19 female (63%). Based on the statistical analysis, there was a significant difference ($p=.04$) in gender

between the two markets. The frequency of age was distributed fairly even between the two markets, with the highest combined percentage in the 40-65 age group range (n=20, 33.33%). There was a significant difference (p=<.0001) observed between participants from each market in terms of the population of the town/city in which they lived. In the Cherry Street Market, 25 out of 29 (43%) participants lived in a city where the population was ≥50,000, where as the Stillwater Farmers’ Market, 17 out of 30 (59%) participants lived in the 20,000-49,999-population range. A majority of participants (47.27% combined) from both markets fell within the \$24,000-59,999 income bracket. Ten participants from the Stillwater Farmers’ Market reported incomes at or below \$23,999, compared to four participants from the Cherry Street Market. No significant differences in income were observed between the two markets.

Table 1. Gender demographics of shoppers at each farmers’ market.

	Male		Female		χ^2	p-value
	n	%	n	%		
Tulsa ¹	19	63	11	37	4.3	0.04*
Stillwater ²	11	37	19	63		

¹Tulsa represents the Cherry Street Farmers’ Market that accepts EBT payments (n=30)

²Stillwater represents the Stillwater Farmers’ Market that does not accept EBT payments (n=30)

* Contains cells that had significant differences between the two markets with $\alpha=.05$

Table 2. Age, population, and income demographics of shoppers at each farmers' market.

		Age									
		≤25 years		26-39 years		40-65 years		≥65 years			
		n	%	n	%	n	%	n	%	χ^2	p-value
Tulsa ¹		10	33	8	27	10	33	2	7	0.1115	0.99
Stillwater ²		9	30	9	30	10	33	2	7		

		Population									
		≤9,999		10,000-19,999		20,000-49,999		≥50,000			
		n	% ^a	n	% ^a	n	% ^a	n	% ^a	χ^2	p-value
Tulsa ¹		1	3	0	0	3	5	25	43	28.9247	<.0001*
Stillwater ²		4	14	3	5	17	59	5	8		

		Income									
		≤\$23,999		\$24,000-59,999		\$60,000-79,999		≥\$80,000			
		n	% ^a	n	% ^a	n	% ^a	n	% ^a	χ^2	p-value
Tulsa ¹		4	15	12	44	4	15	7	26	6.1091	0.11
Stillwater ²		10	36	14	50	1	4	3	11		

¹Tulsa represents the Cherry Street Farmers' Market that accepts EBT payments (age: n=30, population n=29, income n=27)

²Stillwater represents the Stillwater Farmers' Market that does not accept EBT payments (age: n=30, population n=29, income n=28)

^aRows may not total 100% due to rounding.

*Contains cells that had significant differences between the two markets with $\alpha=.05$

Governmental Assistance Findings

This section of the survey investigated whether or not the participant took part in a government assisted food program, specifically Supplemental Nutrition Assistance Program (SNAP), Women, Infants, and Children (WIC) or Food Distribution Program (FDP). The findings

can be observed in Table 3. Of the 30 participants from the Cherry Street Market, three reported being participants in SNAP, and four of the 29 patrons from the Stillwater Market reported being a participant (1 WIC, and 3 SNAP). The three (100%) participants from the Tulsa market reported eating more fresh fruits and vegetables because they could use SNAP benefits at the local farmers' market. In Stillwater, three of the four (75%) that participated in WIC or SNAP reported that they would eat more fresh fruits and vegetables if they could use WIC or SNAP benefits at the local farmers' market.

Table 3. Results for questions regarding government food assistance programs.

Do you participate in a government food assistance program?						
	Yes		No		χ^2	p-value
	n	%	n	%		
Tulsa ¹	3	10	27	90	0.2	0.65
Stillwater ²	4	14	25	86		

If YES, which?						
	WIC		SNAP		χ^2	p-value
	n	%	n	%		
Tulsa	0	0	3	100	0.88	0.35
Stillwater	1	25	3	75		

Do or would you eat more fruits and vegetables when you can use your WIC, or SNAP benefits at farmers' markets?						
	Yes		No		χ^2	p-value
	n	%	n	%		
Tulsa	3	100	0	0	1.06	0.59
Stillwater	3	75	1	25		

¹Tulsa represents the Cherry Street Farmers' Market that accepts EBT payments (do you participate: n=30, yes participate n=1, eat more f/v n=6)

²Stillwater represents the Stillwater Farmers' Market that does not accept EBT payments (do you participate: n=26, yes participate n=6, eat more f/v n=2)

Shopping Preference Findings

The next portion of the survey collected information about shopping preferences for fresh produce of participants at each market. In Tulsa, 60% (18 of 30) of participants surveyed at the Cherry Street Market reported purchasing fresh fruits and vegetables once a week, and 23% (seven of 30) of participants reported purchasing fresh produce more than once a week. In Stillwater, 41% (12 of 29) reported purchasing fresh fruits and vegetables once a week, and 41% (12 of 29) reporting purchasing fresh produce more than once a week. Five participants from each market, 10 total, reported purchasing fresh produce either once a month, twice a month, or depending upon what was available (Table 4). Of the participants surveyed, 77% at the Cherry Street Farmers’ Market, and 79% at the Stillwater Farmers’ Market reported being the primary shopper of fresh fruits and vegetables for their households (Table 5). In Tulsa, 27 of the 29 participants (93%) answered they knew how to prepare fresh fruits and vegetables, and in Stillwater 29 of 30 (97%) reported they knew how to prepare fresh fruits and vegetables (Table 5).

Table 4. Frequency of fresh fruit and vegetable purchases.

	Tulsa ¹		Stillwater ²		χ^2	p-value
	n	%	n	%		
Once a week	18	60	12	41	6.3	0.18
More than once a week	7	23	12	41		
Once a month	1	3	0	0		
Twice a month	3	5	1	3		
Varies with season and what is available	1	2	4	14		

¹Tulsa represents the Cherry Street Farmers’ Market that accepts EBT payments (n=30)

²Stillwater represents the Stillwater Market that does not accept EBT payments (n=29)

Table 5. Primary shopper of household, and knowledge of preparing fresh fruits and vegetables.

I am the primary shopper of fresh fruits and vegetables for my household?						
	Tulsa¹		Stillwater²		χ^2	P-value
	n	%	n	%		
Yes	23	77	23	79	0.06	0.81
No	7	23	6	21		

I know how to prepare fresh fruits and vegetables?						
	Tulsa		Stillwater		χ^2	P-value
	n	%	n	%		
Yes, I know how	27	93	29	97	0.39	0.53
No, I do not know how	2	7	1	3		

¹Tulsa represents the Cherry Street Farmers' Market that accepts EBT payments (n=30, n=29 respectively)

²Stillwater represents the Stillwater Farmers' Market that does not accept EBT payments (n=29, n=30 respectively)

This study investigated where participants from each market shopped most often for fresh fruits and vegetables (Table 6). The most common place Tulsa participants shopped for fresh produce was a grocery store with 70% (21 of 30) of participants selecting this response. There was a significant difference (p=.0156) found between the two markets in participants who chose farmers' markets as their primary place to shop for fresh fruits and vegetables. In Stillwater, 24 of 29 (83%) selected this answer choice, compared to 16 out of 30 (53%) in Tulsa. Another significant difference (p=.0027) found between the participants at the two markets was the use of Super Stores (i.e. Super Wal-Mart, Super Target, etc.) as the primary place of purchase for fresh fruits and vegetables. In Tulsa, eight of 30 (27%) Cherry Street Farmers' Market participants selected super stores as their primary place, compared to 19 of 29 (66%) Stillwater participants.

The survey required participants to reflect on factors considered when purchasing fresh fruits and vegetables (Table 7). The most frequent answer options selected at each market were

taste/flavor and appearance. In Tulsa, 28 of 30 (93%) participants, and in Stillwater, 23 of 29 (79%) participants consider taste/flavor when purchasing fresh produce. Seventy-seven percent (23 of 30) of participants at the Cherry Street Farmers' Market consider appearance when purchasing fresh fruits and vegetables, compared to 79% (23 of 29) of participants at the Stillwater Farmers' Market. Over half of the participants from each market (57% of Tulsa participants, and 59% of Stillwater) reported price was a consideration when purchasing fresh produce. Additional considerations made by participants were produce in season (Tulsa=53%, Stillwater=66%), organic production (Tulsa=37%, Stillwater=38%), health benefits (Tulsa=63%, Stillwater=52%), and whether produce was grown locally (Tulsa=63%, Stillwater= 52%). No statistical differences were observed between the two markets in regard to considerations made by participants at each market when purchasing fresh fruits and vegetables.

Participants were asked to select whether they preferred conventionally grown or organically grown fruits and vegetables. Though not significantly different, the results indicate three of 30 (10%) participants in Tulsa, and two of 29 (7%) participants in Stillwater prefer conventionally grown produce. Six of 30 (53%) participants from the Cherry Street Market, and 15 of 29 (54%) participants from the Stillwater Market, reported preferring organically grown produce. In Tulsa, 10 participants (30%) stated that it did not make any difference how the produce was grown, compared to 11 (39%) participants from Stillwater (Table 8). Participants from each market were asked to consider the price difference they would pay for organically grown produce over conventionally grown produce (Table 9). Eleven of 30 (38%) participants from the Cherry Street Farmers' Market reported they would purchase organically grown produce no matter the price difference, compared to six of 30 (23%) participants from the Stillwater Farmers' Market. In Tulsa, 14% of participants reported they would spend 20 cents more per pound for organically grown produce over conventionally grown produce, with 27% of

participants from Stillwater willing to pay 20 cents more per pound. When the price difference surpassed 20 cents more per pound the number willing to buy organic produce decreased.

Table 6. Where shoppers purchase their fresh fruits and vegetables.

	Tulsa ¹		Stillwater ²		χ^2	p-value
	n	%	n	%		
Grocery Store						
Yes	21	70	18	62	0.41	0.18
No	9	30	11	38		
Super Store						
Yes	8	27	19	66	8.97	0.0027*
No	22	73	10	64		
Warehouse						
Yes	2	7	3	10	0.26	0.61
No	28	93	26	90		
Whole Foods Store						
Yes	8	27	6	21	0.29	0.59
No	22	73	23	79		
Farmers' Market						
Yes	16	53	24	83	5.85	0.0156*
No	14	47	5	17		
Home Garden						
Yes	9	30	6	21	0.67	0.41
No	21	70	23	79		
Restaurant						
Yes	1	3	2	7	0.39	0.53
No	29	97	27	93		
Convenient Store						
Yes	0	0	1	3	1.05	0.31
No	30	100	28	97		
School Food Service/Cafeteria						
Yes	1	2	2	7	0.39	0.53
No	29	97	27	93		
Food Co-op						
Yes	0	0	1	3	1.05	0.31
No	30	100	28	97		
Other						
Yes	2	7	0	0	2.00	0.16
No	0	93	29	100		

¹Tulsa represents the Cherry Street Farmers' Market that accepts EBT payments (n=30)

²Stillwater represents the Stillwater Farmers' Market that does not accept EBT payments (n=29)

*Contains cells that had significant differences between the two markets with $\alpha=.05$

Table 7. Considerations shoppers make when purchasing fresh fruits and vegetables.

	Tulsa ¹		Stillwater ²		χ^2	p-value
	n	%	n	%		
Taste/flavor						
Yes	28	93	23	79	2.47	0.12
No	2	7	6	21		
Appearance						
Yes	23	77	23	79	0.06	0.81
No	7	23	6	21		
Food Safety						
Yes	10	33	11	38	0.14	0.71
No	2	67	18	62		
Price						
Yes	17	57	17	59	0.02	0.88
No	13	43	12	41		
Amount in Package						
Yes	11	37	8	28	0.56	0.46
No	19	63	21	72		
Produce in Season						
Yes	16	53	19	66	0.91	0.34
No	14	47	10	34		
Organic Production						
Yes	11	37	112	38	0.01	0.92
No	19	63	18	62		
Environmental Impact						
Yes	7	23	7	24	0.01	0.94
No	23	77	22	76		
Health Benefits						
Yes	19	63	15	52	0.81	0.37
No	11	37	14	48		
Availability of Product						
Yes	7	23	9	31	0.44	0.51
No	23	77	20	69		
Where Food is Produced						
Yes	13	43	11	38	0.18	0.67
No	17	57	38	62		
Locally Grown						
Yes	19	63	15	52	0.81	0.37
No	11	37	14	48		

¹Tulsa represents the Cherry Street Farmers' Market that accepts EBT payments (n=30)

²Stillwater represents the Stillwater Farmers' Market that does not accept EBT payments (n=29)

Table 8. Type of fruits and vegetables shoppers prefer.

	Conventionally Grown		Organically Grown		Either, Makes No difference		Neither, I do not buy fresh produce		χ^2	p-value
	n	%	n	%	n	%	n	%		
Tulsa ^{1 a}	3	10	16	53	10	33	1	3	1.21	0.75
Stillwater ²	2	7	15	54	11	39	0	0		

¹Tulsa represents the Cherry Street Farmers' Market that accepts EBT payments (n=30)

²Stillwater represents the Stillwater Farmers' Market that does not accept EBT payments (n=29)

^aRows may not total 100% due to rounding.

Table 9. Price differences participants would pay for organically grown produce over conventionally grown produce.

	Tulsa ¹		Stillwater ²		χ^2	p-value
	n	%	n	%		
The same, no difference	6	21	5	19	5.43	0.61
10 cents per pound	4	14	4	15		
20 cents per pound	4	14	7	27		
40 cents per pound	3	10	2	8		
60 cents per pound	0	0	1	4		
80 cents per pound	1	3	0	0		
I would always buy organically grown	11	38	6	23		
I would always buy conventionally	0	0	1	4		

¹Tulsa represents the Cherry Street Farmers' Market that accepts EBT payments (n=29)

²Stillwater represents the Stillwater Farmers' Market that does not accept EBT payments (n=26)

Factors That Influence Farmers' Market Purchases

This study investigated factors that influenced the choice of participants to shop at farmers' markets, as well as factors that deterred participants from shopping at farmers' markets. Survey results showed participants chose to shop at farmers' markets because they perceived the appearance of produce to be better with 62% of Tulsa participants, and 60% of Stillwater participants selecting that answer. Additionally, 62% of Tulsa participants, and 77% of participants from Stillwater, reported the taste of produce from farmers' markets was better. Fifty-two percent of Tulsa participants, and 74% of Stillwater participants reported they shopped at farmers' markets because they knew the source of the produce. Another highly selected answer by participants from each market as to why they chose to shop at farmers' markets was because of they wanted to support local growers. While not a significant difference, 76% of Tulsa participants compared to 83% of participants from Stillwater selected this answer. These results can be seen in Table 10.

Participants were deterred from shopping at farmers' markets more frequently because of the distance from the market to their home. Thirty-one percent (9 of 29) participants in Tulsa, and 10% (3 of 30) of participants in Stillwater selected this answer choice which was a significant difference between the two markets ($p=0.04$). Participants reported that they would shop at the farmers' market more often if the days and hours in which it was open were more convenient with 59% selecting this option from the Cherry Street Market, and 47% selecting this option from the Stillwater Market. Refer to Table 11 for results.

Table 10. Reason participants shop at farmers' markets.

	Tulsa ¹		Stillwater ²		χ^2	p-value
	n	%	n	%		
Better Appearance						
Yes	18	62	18	60	0.03	0.87
No	11	38	12	40		
Better Taste						
Yes	18	62	23	77	1.48	0.22
No	11	38	7	23		
Better Price						
Yes	4	14	6	20	0.40	0.52
No	25	86	24	80		
Ability to use WIC/SNAP						
Yes	2	7	0	0	2.14	0.14
No	27	93	30	100		
Knowing where produce came from						
Yes	15	52	22	73	2.94	0.08
No	14	48	8	27		
Support Local Growers						
Yes	22	76	25	83	0.51	0.48
No	7	24	5	17		
Buy what I need						
Yes	6	21	9	30	0.67	0.41
No	19	63	18	62		
I do not shop at farmers' markets						
Yes	1	3	0	0	1.05	0.31
No	0	97	30	100		
Other						
Yes	2	7	1	3	0.39	0.53
No	27	93	29	97		

¹Tulsa represents the Cherry Street Farmers' Market that accepts EBT payments (n=29)

²Stillwater represents the Stillwater Farmers' Market that does not accept EBT payments (n=30)

Table 11. Reason participants do not shop at farmers' markets more often.

	Tulsa ¹		Stillwater ²		χ^2	p-value
	n	%	n	%		
Proximity to home						
Yes	9	31	3	10	4.03	0.04*
No	20	69	27	90		
Convenience of hours/days						
Yes	17	59	14	47	0.85	0.36
No	12	41	16	53		
Prices						
Yes	2	7	6	20	2.16	0.14
No	27	93	24	80		
I had transportation						
Yes	1	3	1	3	0.001	0.98
No	29	97	29	97		
Availability of local produce						
Yes	1	3	3	10	1.00	0.32
No	28	97	27	90		
I had more time						
Yes	11	34	7	23	1.48	0.22
No	18	62	23	77		
I could use SNAP or WIC benefits						
Yes	0	0	3	10	3.06	0.08
No	29	100	27	90		
It is already my primary source						
Yes	5	17	10	41	2.01	0.16
No	19	63	18	62		
Other						
Yes	1	3	1	3	0.00	0.98
No	28	97	29	97		

¹Tulsa represents the Cherry Street Farmers' Market that accepts EBT payments (n=29)

²Stillwater represents the Stillwater Farmers' Market that does not accept EBT payments (n=30)

*Contains cells that had significant differences between the two markets with $\alpha=.05$

CHAPTER V

DISCUSSION, SUMMARY, & CONCLUSION

Discussion

The two Oklahoma farmers' markets where surveys for this study were administered were the Cherry Street Farmers' Market in Tulsa, and the Stillwater Farmers' Market in Stillwater. Both markets sold only 100% Oklahoma grown products, and were both members of the Oklahoma Food Cooperative. One difference between the markets was the Stillwater market only sold locally grown produce, where as the Cherry Street market sold both local and non-locally grown produce. Locally grown produce is produce that is grown in the county in which the market is located, or any adjoining county. Another difference between the markets is the Stillwater Farmers' Market does not accept SNAP, and the Cherry Street Farmers' Market does accept SNAP. Although not significant ($p=0.08$), this study found that shoppers from the Stillwater market shopped at the farmers' market because they knew where the produce was from. It appeared that the availability of 100% locally grown produce was an important aspect of the farmers' market to shoppers in Stillwater. Another difference between the markets in this study was that Stillwater has one farmers' market and Tulsa has eight markets.

According the 2009 US Census Bureau, Tulsa had a reported population of 389,625, compared to Stillwater's reported population of 46,165. Additionally, the US Census reported

Tulsa covered 186.8 square miles of land, compared to Stillwater which covered 28.3 square miles. The average age of the population living in Tulsa was 34 years old, with a 110:94 female to male ratio. In Stillwater, the average age of the population was 24 years old, with a 100:103 female to male ratio. According to similar national studies, the average age of farmers' market shoppers were ≥ 50 years of age^{41, 42}. However, The Kerr Center for Sustainable Agriculture found in 2002, the average age of a farmers' market shopper in Oklahoma was 36 years old⁶⁷. The median income per household in Tulsa in 2009 was \$35,316 compared to the median income per household of \$25,432 in Stillwater. Nationally, the average income of an individual who shops at a farmers' market is thought to fall in the \$40,000-69,000 range, which is higher than the average incomes of both cities observed in this study⁵⁵. The difference in the demographics of the two cities could have been the basis for some statistical differences found in the results of this study.

The findings of this study showed similarities between the shoppers at each type of market. However, significant differences were observed between the two markets in terms of the population size of the area in which the shopper lived, gender of shoppers at each market, shoppers who used farmers' markets and shoppers who used super stores as primary source of fresh fruits and vegetables, and shoppers who selected distance as a major reason for shopping farmers markets less often.

Gender of those surveyed at the two markets was significantly different ($p=0.04$). Shoppers at the Cherry Street Farmers' Market were primarily male while the shoppers surveyed at the Stillwater Farmers' Market were primarily female. Though significantly different, this finding could be a result of use of a convenience sample, and therefore may not be an accurate representation of gender of the population of shoppers at each market. This finding can be related to those of Govindasamy et al., who stated that nationally farmers' market shoppers tended to female⁴¹.

Based on survey responses, a significant difference ($p < 0.001$) in the population of the town/city where shoppers lived was found between the two markets. In Tulsa, most shoppers lived in the $\geq 50,000$ population range, whereas most Stillwater shoppers lived in the 20,000-49,999 population range. This finding can be explained by the difference in the population size of the two towns in which the farmers' markets selected for this study are located.

The study indicated there was a significant difference ($p = 0.0027$) between the shoppers at the two markets who chose to shop at super stores (i.e. Wal-Mart, Target, etc.) to purchase fresh produce. More shoppers in Stillwater used super stores as a source than Tulsa shoppers. This could be due to the fact that Stillwater has two Super Wal-Mart stores, and two grocery stores from which to choose compared to the numerous food stores from which Tulsa shoppers may choose to shop at. Additionally, there was a significant difference ($p = 0.0156$) in the number of shoppers who chose to shop at farmers' markets as their primary source of fresh produce. More of those surveyed in Stillwater shopped at farmers' markets as their primary source of fresh fruits and vegetables than those surveyed in Tulsa, which can again be related to the increase in options that Tulsa shoppers can go to purchase fresh produce. An additional explanation for the findings of this study can be compared to the findings of a national study conducted by Martinez et al., who suggest that individuals shop at farmers' markets because they believe products from markets are of better value, quality, nutrition, freshness, and appearance than similar products from grocery stores or super markets⁴².

This study asked shoppers reasons why they did not shop at farmers' markets more often. For the response choice 'Proximity to Home', there was a significant difference ($p = 0.04$) between the two markets. More shoppers in Tulsa chose this option than shoppers in Stillwater. This could be a result of the difference in the size in square miles between the cities in which the two markets are located. Although not significant ($p = 0.08$), this study found that shoppers in Stillwater who utilize SNAP or WIC would shop at the Stillwater Farmers' Market more often if

they could use their benefits at the market. Tulsa SNAP users were already able to use benefits at the farmers' market when shopping. Results could suggest that the organizers of the Stillwater Market should consider implementing the acceptance SNAP benefits.

The survey design allowed shoppers to write responses not included on the survey if they desired. On survey question #6, 'If you answered yes to participating in government food assistance programs, which?', one shopper wrote that he/she participated in the Senior Nutrition Program. Two shoppers added responses on survey question #15, 'I shop at farmers' markets because', one shopper stated they shopped at the farmers' market because of the availability of organically grown produce, and another shopper wrote they shopped at the farmers' market because it provided them with a sense of community.

Summary

The purpose of this study was to evaluate the shopping preferences and considerations of shoppers at two different types of farmers' markets in the state of Oklahoma; one that accepted SNAP EBT, and one that did not. Additionally, the study evaluated whether or not fruit and vegetable consumption was affected based on the ability to use (or to not use) SNAP benefits at farmers' markets.

Null hypothesis one stated that there would be no difference in demographics (gender, age, population, and income) between the shoppers at the Stillwater Farmers' Market, and the Cherry Street Farmers' Market. Significant differences were observed in gender ($p=0.04$), and population where shopper lived ($p<0.0001$) between the participants from each market. Therefore, null hypothesis one is rejected.

Null hypothesis two stated that there would be no differences in factors considered during purchase of fresh fruits and vegetables between shoppers at the two farmers' markets. No significant differences were observed between the two markets in the factors the shoppers considered during the purchase of fresh fruits and vegetables. Therefore, we fail to reject null hypothesis two.

Null hypothesis three stated that there would be no differences found between where the shoppers at the two markets most often purchase their fresh fruits and vegetables. Significant differences were observed in the purchasing fresh fruits and vegetables in super stores ($p=0.0027$), and farmers' markets ($p=0.0156$). Therefore, null hypothesis three is rejected.

Null hypothesis four stated that there would be differences found in self described consumption of fresh fruits and vegetables between shoppers based on the ability to use SNAP at their local farmers' market. No significant differences were found in fruit and vegetable consumption between shoppers at the two markets based on ability to use SNAP. Therefore, we fail to reject null hypothesis four. However, the sample population that participated in SNAP in this study was small and therefore a conclusive statement may be inaccurate until further research is conducted on a larger sample size.

Conclusion

In conclusion, there were differences observed between shoppers at farmers' markets that accepted SNAP EBT, and markets that did not accept SNAP EBT in Oklahoma. However, many of these finding could be due to small sample size and differences in the location of the two markets utilized in this study.

Recommendations

Overall, based on the findings of this study the researcher recommends that all farmers' markets in Oklahoma, and eventually the United States need to be educated on the process of incorporating SNAP into their markets. This would be beneficial for many low-income families, and could potentially help increase fruit and vegetable consumption in these particular individuals. Additionally, this study indicated a reason shoppers did not shop at the market more often was due to the inconvenient times and days of operation for their local market. Farmers' markets in Oklahoma should conduct their own surveys to find which times and days would be more convenient for their shoppers.

Implication for Future Research

Based on the results of this study, the researcher would recommend that another study be performed that looked at farmers' markets that were more similar demographically. Additionally, recommendations that the researcher have better protocol on recruiting participants who participated in SNAP, as it was impossible to determine who was a SNAP participant when approaching individuals within the market setting.

If a similar study were to be conducted, collecting information on education levels, and household sizes of participants would be an interesting aspect to observe as many studies in the literature review suggest that those who are highly educated and live in a two person household are more likely to shop at farmers' markets. It would be interesting to see if the same holds true for market shoppers in Oklahoma. Lastly, a question that focused on how many times a week Oklahoma farmers' market shoppers eat home cooked meals would be would be interesting to investigate, and compare to national studies.

REFERENCES

1. United States Department of Agriculture. Why it is important to eat fruit. Available at http://www.mypyramid.gov/pyramid/fruits_why.html. Accessed November 17, 2010.
2. United States Department of Agriculture. Why it is important to eat vegetables. Available at http://www.mypyramid.gov/pyramid/vegetables_why.html. Accessed October 13, 2011.
3. State of the State's Health Report. Fruit and vegetable consumption by county-oklahoma. 2008. Available at <http://www.ok.gov/health/pub/boh.state/IndicatorReportCards/fruit-vegetable%20consumption.pdf>. Accessed February 10, 2011.
4. Centers for Disease Control and Prevention. Fruit & vegetable strategies to - increase access, availability, and consumption. 2010. Available at <http://www.cdph.ca.gov/SiteCollectionDocuments/StratstoIncreaseFruitVegConsumption.pdf>. Accessed December 2, 2010.
5. OKGrown. Markets. N.D. Available at <http://www.okgrown.com/markets>. Accessed November 17, 2010.
6. United States Department of Agriculture. Organic production. N.D. Available at http://afsic.nal.usda.gov/nal_display/index.php?info_center=2&tax_level=1&tax_subject=296. Accessed April 4, 2011.
7. Center for American Progress. Organic vs. conventional foods. 2008. Available at http://www.americanprogress.org/issues/2008/09/organic_green.html. Accessed April 4, 2011.

8. Farflex. Definition: fresh food. N.D. Available at <http://www.thefreedictionary.com/fresh+food>. Accessed April 4, 2011.
9. Jalonic, M.C. Locally grown? It all depends how you define it. *Seattle PI*. 2011. Available at <http://www.seattlepi.com/news/article/Locally-grown-It-all-depends-on-how-you-define-it-1318501.php>. Accessed April 4, 2011.
10. United States Department of Agriculture. Farmers' markets and local food marketing. 2011. Available at <http://www.ams.usda.gov/AMSV1.0/ams.fetchTemplateData.do?template=TemplateC&navID=FarmersMarketsLinkWholesaleAndFarmersMarkets&rightNav1=FarmersMarketsLinkWholesaleAndFarmersMarkets&topNav=&leftNav=WholesaleandFarmersMarkets&page=WFMFarmersMarketsHome&resultType=&acct=frmrdirnkt>. Accessed . April 4, 2011.
11. United States Department of Agriculture. About USDA. 2011. Available at http://www.usda.gov/wps/portal/usda!/ut/p/c5/04_SB8K8xLLM9MSSzPy8xBz9CP0os_gAC9-wMJ8QY0MDpxBDA09nXw9DFxcXQ-cAA_1wkA5kFaGuQBXeASbmnu4uBgbe5hB5AxzA0UDfzyM_N1W_IDs7zdFRUREAZXAypA!!/dl3/d3/L2dJQSEvUUt3QS9ZQnZ3LzZfUDhNVIZMVDMxMEJUMTBJQ01IMURERDFDUDA!/?navtype=MA&navid=ABOUT_USDA. Accessed April 2, 2011.
12. United States Department of Agriculture, Food and Nutrition Service. A short history of SNAP. N.D. Available at <http://www.fns.usda.gov/snap/rules/Legislation/about.htm>. Accessed October 18, 2010.

13. United States Department of Agriculture, Food and Nutrition Service. Development of electronic benefit transfer (EBT): 1988-2004. N.D. Available at <http://www.fns.usda.gov/snap/rules/Legislation/about.htm>. Accessed December 13, 2010.
14. United States Department of Agriculture, Food and Nutrition Service. Women, infants, and children. N.D. Available at <http://www.fns.usda.gov/wic/>. Accessed October 13, 2011.
15. United States Department of Agriculture, Food and Nutrition Service. Food distribution program. N.D. Available at <http://www.fns.usda.gov/fdd/>. Accessed April 4, 2011.
16. Saquib N, Rock CL, Natarahan L, Flatt SW, Newman VA, Thompson CA, Caan BJ, Pierce JD. Does a healthy diet help weight management among overweight and obese people? *Health Education and Behavior*. 2009;36:518-531.
17. Center for Disease Control and Prevention. Vital signs: state-specific obesity prevalence among adults- united states, 2009. 2010. Available at http://www.cdc.gov/mmwr/preview/mmwrhtml/mm59e0803a1.htm?s_cid=mm59e0803a1_e%0D%0A. Accessed February 10, 2011.
18. Center for Disease Control and Prevention. Overweight and obesity U.S. trends by state 1985-2009. 2010. Available at <http://www.cdc.gov/obesity/data/trends.html>. Accessed February 10, 2011.
19. Astup A. How to maintain a healthy body weight. *International Journal for Vitamins and Nutrients Research*. 2006;76(4):208-215.
20. Dauchet L, Amouyel P, Dallongeville J. Fruits, vegetables, and coronary heart disease. *Nature Reviews Cardiology*. 2009;6:599-608.

21. Tanumihardjo SA, Valentine AR, Zhang ZM, Whingham LD, Lai HC, Atkinson RL. Strategies to increase vegetable consumption or decrease energy and fat intake to reduce weight loss in adults. *Experimental Biology and Medicine*. 2009;234(5):542-552.
22. Shibata A, Paganini-Hill A. Intake of vegetables, fruits, b-carotene, vitamin c, and vitamin supplements and cancer incidence in the elderly: a prospective study. *British Journal of Cancer*. 1992;66(2):673-679.
23. He FJ, Nowson CA, MacGregor CA. Increased consumption of fruit and vegetables is related to a reduced risk of coronary heart disease: meta-analysis of cohort studies. *Journal of Human Hypertension*. 2007;21:717-728.
24. Oklahoma Diabetes Control and Prevention Program. Oklahoma's diabetes plan-reducing the burden of diabetes.2003. Available at <http://www.ok.gov/health/documents/Diabetes%20plan%20final.pdf>. Accessed February 10, 2011.
25. Centers for Disease Control and Prevention. National diabetes fact sheet. N.D. Available at <http://apps.nccd.cdc.gov/DDTSTRS/FactSheet.aspx>. Accessed February 10, 2011.
26. Centers for Disease Control and Prevention. County level estimates of obesity-state maps. N.D. Available at http://apps.nccd.cdc.gov/DDT_STRS2/CountyPrevalenceData.aspx?mode=OBS. Accessed February 10, 2011.
27. Centers for Disease Control and Prevention. Diabetes and data trends. N.D. Available at <http://apps.nccd.cdc.gov/ddtstrs/default.aspx>. Accessed November 18, 2010.
28. Hodge AM, English DR, O'Dea K, Giles GG. Dietary patterns and diabetes incidence in the Melbourne collaborative study. *American Journal of Epidemiology*. 2007;165(6):603-610.

29. Schafer E. The health value of fruits and vegetables. *Iowa State University Cooperative Extension Services*. 2010. Available at <http://www.extension.iastate.edu/Publications/PM1855.pdf>. Accessed November 20, 2010.
30. Produce for Better Health Foundation. State of the plate: 2010 study on Americas consumption of fruit and vegetables. 2010. Available at <http://www.pbhfoundation.org/pdfs/pulse/research/pbhresearch/stateplate.pdf>. Accessed November 18, 2010.
31. World Health Organization and Food and Agriculture Organization of the United Nations. Fruit and vegetables for health: report of a joint fao/who workshop 1-3 September 2004. 2005. Available at http://www.who.int/dietphysicalactivity/publications/fruit_vegetables_report.pdf. Accessed February 12, 2011.
32. DeNaus-Walt C, Proctor BD, Smith JC. Income, poverty, and health insurance coverage in the United States: 2009. 2010. *Current Population Reports-Consumer Income*. Available at <http://www.census.gov/prod/2010pubs/p60-238.pdf>. Accessed February 13, 2011.
33. United States Department of Agriculture, Economic Research Service. State fact sheets: Oklahoma. 2009. Available at <http://www.ers.usda.gov/statefacts/ok.htm#TCEC>. Accessed February 13, 2011.
34. The Hand That Feeds U.S.. Farm to fork: USDA food prices to rise in 2010. 2009. Available at http://www.thehandthatfeedsus.org/farm2fork_USDA-Food-Prices-to-Rise-2010.cfm. Accessed February 12, 2011.

35. United States Department of Agriculture, Economic Research Service. Food cpi and expenditures: analysis and forecasts of the cpi for food. N.D. Available at http://www.thehandthatfeedsus.org/farm2fork_USDA-Food-Prices-to-Rise-2010.cfm. Accessed February 12, 2011.
36. The State of the State's Health Report. A report from the Oklahoma State Board of Health. 2009. Available at <http://www.ok.gov/health/pub/boh/state97/index/html>. Accessed February 20, 2011.
37. Whelan A, Wringley N, Warm D, Cannings E. Life in a food desert. *Urban Studies*. 2002;39:2083-2100.
38. Valliantos M, Shaffer A, Gottlieb R. Transportation and food: the importance of access. A Policy Brief of the Center for Food and Justice, Urban and Environmental Policy Institute. 2002. Available at http://departments.oxy.edu/uepi/cfj/publications/transportation_and_food.pdf. Accessed February 12, 2011.
39. County Technical Services Incorporated. Health Awareness: A County Health Pool Publication. Fruit and Vegetable Benefits. 2008. Available at <http://www.ctsi.org/PDF/healthawareness/HelAwa%20Sep08.pdf>. Accessed February 12, 2011.
40. Wolf RL, Lepore SJ, Vandergrift JL, Wetmore-Arkader L, McGinty E, Pietrzak G, Yaroch AL. Knowledge, barriers, and stage of change as correlates of fruit and vegetable consumption among urban mostly immigrant black men. *Journal of the American Dietetic Association*. 2008;108(8):1315-1322.
41. Govindasamy R, Zurbriggen M, Italia J, Adelaya A, Nitzsche P, VanVranken R. Farmers' markets: consumer trends, preference, and characteristics. *New Jersey Agriculture Experiment Station-Rutgers*. 1998:1-26.

42. Wolf MM, Spitter A, Ahern J. A profile of farmers' markets consumers and the perceived advantages of produce sold at farmers' markets. *Journal of Food Distribution Research*. 2005;36(1):192-201.
43. Petrini C. *Slow food nation: why our food should be good, clean, and fair*. New York: 2008.
44. Martinez S, Hand M, DaPra M, Pollack S. Local food concepts, impacts, and issues. *United States Department of Agriculture, Economic Research*. 2010;ERR 97.
45. Keeling-Bond J, Thilmary D, Bond C. What influences consumer choice of fresh produce purchase location? *Journal of Agriculture and Applied Economics*. 2009;41(1):61-74.
46. Zepeda L, Li J. Who buys local food? *Journal of Food Distribution Research*. 2006;37:1-11.
47. Pick, D., Perez, A. Characterizing U.S. fruit and vegetable production. *United States Department of Agriculture, Economic Research Service*. 2006. Available at from <http://migration.ucdavis.edu/cf/files/Pick.pdf>. Accessed November 18, 2010.
48. Wang SL. Is u.s. agriculture productivity slowing growth? *Amber Waves*. 2010;8:(3):6.
49. Krissoff B, Wainio J. U.S. fruit and vegetable imports outpace exports. *Amber Waves*. 2005;3(3):2-3.
50. United States Department of Agriculture, Economic Research Service. U.S. per capita loss-adjusted food availability: individual vegetable. N.D. Available at <http://www.ers.usda.gov/data/foodconsumption/app/reports/displayCommodities.aspx?reportName=Individual%20vegetable&id=7#startForm>. Accessed February 17, 2011.

51. United States Department of Agriculture, Economic Research Service. U.S. per capita loss-adjusted food availability: individual fruit. N.D. Available at <http://www.ers.usda.gov/data/foodconsumption/app/reports/displayCommodities.aspx?reportName=Individual%20fruit&id=7#startForm>. Accessed February 17, 2011.
52. Pimentel D, Hepperly P, Hanson J, Seidel R, Doups D. Organic and conventional farming systems: environmental and economic issues. *Cornell University*. 1-52. 2005. Available at http://ecommons.cornell.edu/bitstream/1813/2101/pimental_report_05_1.pdf. Accessed November 12, 2010.
53. Mayo Clinic. Organic foods: are they safer? More nutritious? 2008. Available at http://www.mayoclinic.com/health/organic_food/NU00255/METHOD=print. Accessed October 28, 2010.
54. Dimitri C, Oberholtzer L. Expanding demand for organic foods brings changes in marketing. *Amber Waves*. 2010;8:1-3.
55. Magkos, F., Fotnini, A., Zamelas, A. Organic food: nutritious food or food for thought? *International Journal of Food Sciences and Nutrition*. 2003;54(5):357-371.
56. Green C, Slattery E, William MD. America's organic farmers face issues and opportunities. *Amber Waves*. 2010;8(2):34-39.
57. Winter CK. Organic vs conventional foods: a look at safety and risks. 2006. Available at <http://www.aseha.org/ASEHAorganic.ppt>. Accessed November 8, 2010.
58. Bourn D, Prescott J. A comparison of the nutritional value, sensory qualities and food safety of organically and conventionally produced foods. *Critical Reviews in Food Sciences and Nutrition*. 2002;42:1-34.

59. Brandt K, Molgard JP. Organic agriculture: does it enhance or reduce the nutritional value of plant foods? *Journal of the Science of Food and Agriculture*. 2001;81:924-931.
60. Bourn DM. The nutritional value of organically and conventionally grown food- is there a difference? *Proceedings of the Nutrition Society*. 1994;19:51-57.
61. Woese K, Lange D, Boess C, Bogle K. A comparison of organically and conventionally grown foods- results of a review of the relevant literature. *Journal of the Science of Food and Agriculture*. 1997;73(3):281-293.
62. Mukherjee A, Dycke E, Diez-Conzalez F. Preharvest evaluation of coli forms e. coli, salmonella, and e. coli 0157.H7 in organic and conventional produce grown by Minnesota farmers. *Journal of Food Protection*. 2004;67(5):894-400.
63. United States Department of Agriculture. MyPyramid-steps to a healthier you. N.D. Available at www.mypyramid.gov/. Accessed November 8, 2010.
64. Grebitus C, Yue C, Bruhn M, Jensen HH. What affects consumption patterns of organic and conventional products? *Department of Economics, Center for Agriculture and Rural Development*. 2007. Available at <http://ageconsearch.umn.edu/bitstream/9819/1/sp07gr03.pdf>. Accessed December 8, 2010.
65. Haumann B. Press release- u.s. organic product sales reach \$26.6 billion in 2009. *Organic Trade Association 2010*. 2010. Available at http://www.organicnewsroom.com/2010/04/us_organic_product_sales_reach_1.html. Accessed December 9, 2010.

66. United States Department of Agriculture, Agriculture Marketing Service. USDA announces that national farmers' market directory totals 6,132 farmers' markets. 2010. Available at <http://www.ams.usda.gov/AMSV1.0/ams.printData.do?template=printPage&navID=&page=printPage&dDocId=STELPRDC5085966&dID=136193&wf=false&dDocTitle=USDA+Announces+that+National+Farmers+Market+Directory+Totals+6%2C132++Farmers+Markets>. Accessed November on 13, 2010.
67. The Kerr Center for Sustainable Agriculture. Creating a successful farmers' market. 2002. Available at http://kerrcenter.com/farmers_market/index.html. Accessed December 9, 2010.
68. Roth D. Food stamps: 1932-1977: from provisional and pilot programs to permanent policy. *USDA, ERS*. N.D. Available at <http://www.nal.usda.gov/ric/ricpubs/foodstamps.htm>. Accessed October 18, 2010
69. Oklahoma Department of Human Services. Number of Oklahoman's receiving nutrition benefits increase. 2010. Available at <http://www.okdhs.org/library/news/rel/2010/02/fssd02232010.htm>. Accessed December 8, 2010.
70. United States Department of Agriculture, Food and Nutrition Service. SNAP eligibility. N.D. Available at http://www.fns.usda.gov/snap/applicant_recipients/elegibility.htm. Accessed December 13, 2010.
71. United States Department of Agriculture, Food and Nutrition Service. Guide to expand SNAP benefit ebt technology at farmers' markets. N.D. Available at <http://fns.usda.gov/cga/PressReleases/2010/0346.htm>. Accessed December 12, 2010.

72. Oklahoma Department of Human Services. SNAP- which farmers' markets accept the ebt card. 2010. Available at <http://www.okdhs.org/programsandservices/food/snap/docs/farmersmarkets.htm>. Accessed December 13, 2010.
73. United States Department of Agriculture, Food and Nutrition Service. SNAP market responsibilities. N.D. Available at http://fns.usda.gov/snap/ebt/fm-scrip-market_responsibilities.htm. Accessed December 13, 2010.
74. United States Department of Agriculture, Food and Nutrition Service. SNAP scrip system. N.D. Available at http://www.fns.usda.gov/snap/ebt/fm-scrip-what_is_scrip.htm. Accessed December 13, 2010.

APPENDICES

APPENDIX A

OSU INSTITUTIONAL REVIEW BOARD APPROVAL

Oklahoma State University Institutional Review Board

Date: Monday, August 16, 2010
IRB Application No HE1060
Proposal Title: Comparison of Shopping and Purchasing Preferences at Farmers Markets that Accept SNAP EBT Cards and Those that do not in Oklahoma
Reviewed and Processed as: Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 8/15/2011

Principal Investigator(s):

Claire Grady
815 S. Washington
Stillwater, OK 74074

Barbara J. Brown
301 HES
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.
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 Beth McTernan in 219 Cordell North (phone: 405-744-5700, beth.mcternan@okstate.edu).

Sincerely,



Shelia Kennison, Chair
Institutional Review Board

APPENDIX B

INFORMED CONSENT SCRIPT

Hello, my name is Claire Grady, and I am a graduate student at Oklahoma State University. I am working on a research project that involves looking at the shopping preferences, and the method of payment used at farmers' markets in Oklahoma. I would very much appreciate if you would not mind taking about five to ten minutes of your time to fill out my survey. Here is information on the details of your participation in this project, and you can keep this information sheet. If you have any questions feel free to ask at anytime while completing the survey. If you have any questions in the future, you may contact me by using the information on the back of the information sheet. Upon filling the survey out, you are giving your consent. Thank you.

APPENDIX C

PARTICIPANT INFORMED CONSENT FORM

Comparison of shopping and purchasing preferences at farmers markets that accept SNAP EBT cards and farmers markets that do not in Oklahoma

TO BE READ BY OR TO PARTICIPANTS BEFORE EACH SURVEY IS DONE:

In order for the Oklahoma Cooperative Extension Service to be able to determine the impact the method of payment has on purchases at Farmer's Markets we would like you to participate in this survey. The research will help determine whether or not Oklahoman's shop differently for fruits and vegetables at Farmer's Markets when they pay with cash versus when there is an alternative method of payment.

Completing the survey is voluntary and confidential. You may either read and answer the survey questions or the researcher can read the questions to you for your spoken answers. There is nothing on the survey that would allow us to know who completed the form, when it was completed or where the survey was taken. You can discontinue taking the survey at any time. There are no known risks associated with this project which are greater than those ordinarily encountered in daily life.

There is no immediate benefit to you for participating in the survey. There is no compensation for taking you time to help with the study.

Records of this study will be kept private. The completed surveys will be kept in a file cabinet in 301 HES until June 2011. Any written results will discuss group findings and will not include information that will identify you. Research records will be stored securely and only researchers and individuals responsible for research oversight will have access to the records. It is possible that the consent process and data collection will be observed by research oversight staff responsible for safeguarding the rights and wellbeing of people who participate in research.

If you have any questions about the survey, you may contact:

Claire Grady, Masters Candidate

Oklahoma State University Department of Nutritional Sciences

301 Human Environmental Sciences

Stillwater, OK 74078

(405) 744-5040

Barbara Brown, Ph.D., R.D./L.D.

Food Specialist, Associate Professor

301 Human Environmental Sciences

Oklahoma State University

Stillwater, OK 74078

(405) 744-6940

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

By completing the survey, you are giving your consent. Thank you for your help in improving the quality of our programming.

APPENDIX D

SURVEY INSTRUMENT

Comparison of shopping and purchasing preferences at farmers' markets that accept SNAP EBT cards and farmers' markets that do not in Oklahoma

In order for the Oklahoma Cooperative Extension Service to be able to determine the impact the method of payment has on purchases at Farmer's Markets we would like you to participate in this survey. The research will help determine whether or not Oklahoman's shop differently for fruits and vegetables at Farmer's Markets when they pay with cash versus when there is an alternative method of payment.

DIRECTIONS: Follow the directions at the end of each question. Some questions will ask you to check just one answer, and others will ask you to check more than one answer.

1. Gender (check **one**):

<input type="checkbox"/>	Male
<input type="checkbox"/>	Female

2. Age (check **one**):

<input type="checkbox"/>	25 or younger
<input type="checkbox"/>	26-39
<input type="checkbox"/>	40-64
<input type="checkbox"/>	65 or older
<input type="checkbox"/>	I prefer not to answer

3. The population of the town or city where you live is (check **one**):

<input type="checkbox"/>	Less than 9,999 people
<input type="checkbox"/>	10,000-19,999 people
<input type="checkbox"/>	20,000-49,999 people
<input type="checkbox"/>	50,000 people or more
<input type="checkbox"/>	I do not know

4. My annual income each year is (check **one**):

<input type="checkbox"/>	\$0-23,999
<input type="checkbox"/>	\$24,000-59,999
<input type="checkbox"/>	\$60,000-79,999
<input type="checkbox"/>	\$80,000 or more
<input type="checkbox"/>	I prefer not to answer

5. Do you participate in a government program such as WIC, SNAP, or food commodities? (check **one**):

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No
<input type="checkbox"/>	I do not know
<input type="checkbox"/>	I prefer not to answer

6. If you answered **yes** to the question above, which? (check **one**):

<input type="checkbox"/>	WIC
<input type="checkbox"/>	SNAP
<input type="checkbox"/>	Food Commodities
<input type="checkbox"/>	Other:

7. If you answered **yes** to the question 6, do you eat more fresh fruits and vegetables when you use WIC, SNAP, or Food Commodity benefits at the farmers' market?

<input type="checkbox"/>	Yes.
<input type="checkbox"/>	No.
<input type="checkbox"/>	Does not apply to me.

8. How often do you purchase fresh fruits and vegetables? (check **one**):

<input type="checkbox"/>	Once a week
<input type="checkbox"/>	More than once a week
<input type="checkbox"/>	Once a month
<input type="checkbox"/>	Twice a month
<input type="checkbox"/>	Varies with season and what is available
<input type="checkbox"/>	Never
<input type="checkbox"/>	Other:

9. I am the primary shopper of fresh fruits and vegetables for my household? (check **one**):

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

10. What is your primary source of fresh fruits and vegetables? (check **all that apply**):

<input type="checkbox"/>	Grocery store
<input type="checkbox"/>	Superstore (EX: Wal-Mart, Target, etc.)
<input type="checkbox"/>	Warehouse (EX: Costco, SAMS Club, etc.)
<input type="checkbox"/>	Whole Foods Store
<input type="checkbox"/>	Farmers Market
<input type="checkbox"/>	Home-Garden (own, family, friends, community)
<input type="checkbox"/>	Restaurant
<input type="checkbox"/>	Convenient Store
<input type="checkbox"/>	School food service/cafeteria
<input type="checkbox"/>	Community nutrition site
<input type="checkbox"/>	Food Co-op
<input type="checkbox"/>	Food Bank
<input type="checkbox"/>	I don't buy fresh produce
<input type="checkbox"/>	Other:

11. When I buy fresh fruits and vegetables, I consider the following (check **all that apply**):

	Taste, flavor
	Appearance
	Food Safety
	Price
	Amount in the package because I don't want to have food spoil
	Produce is in season
	Organic production
	Environmental impact of production and shipping
	Health benefits
	Availability of product
	Where food is coming from
	Locally grown
	Other:

12. When buying fresh fruits and vegetables I prefer (check **one**):

	Conventionally grown
	Organically grown
	Either, makes no difference
	Neither, I do not buy fresh produce

13. I know how to prepare fresh fruits and vegetables (check **one**):

	Yes, I do know how.
	No, I do not know how.

14. I would buy from a farmers' markets more often if (check **all that apply**):

	It was closer
	Open different hours/days
	Lower prices
	I had transportation
	Had more local produce
	I had more time
	I could use SNAP or WIC benefits for purchases
	It is already my primary source of fruits and vegetables
	Other:

15. I shop at farmers' markets because (check **all that apply**):

	Appearance of fruits and vegetables is better
	Taste of fruits and vegetables is better
	Prices are better
	The ability to use SNAP or WIC benefits
	I know where fruits and vegetables are coming from
	To support local growers
	Relationships with the sellers
	I can buy what I need and have less wasted food
	I do not shop at farmers' markets
	Other:

16. I would buy organically grown fruits and vegetables over conventionally grown fruits and vegetables if the price difference between them was no more than (check **one** of the following):

	The same, no difference
	10 cents per pound
	20 cents per pound
	40 cents per pound
	60 cents per pound
	80 cents per pound
	I would buy organically grown food no matter the price difference
	I would buy conventionally grown food no matter the price difference

VITA

CLAIRE GRADY

Candidate for the Degree of

Master of Science

Thesis: COMPARISON OF SHOPPING AND PURCHASING PREFERENCES AT FARMERS' MARKETS THAT ACCEPT SNAP EBT CARDS AND FAREMRS' MARKETS THAT DO NOT IN OKLAHOMA

Major Field: Nutritional Sciences

Biographical:

Education: Graduated from Flower Mound High School, Flower Mound, Texas, in May 2005; attended Oklahoma State University from August 2005 to May 2009 completing the requirements for the Bachelor of Science in Nutritional Sciences at Oklahoma State University, Stillwater, Oklahoma in May 2009. Attended graduate school at Oklahoma State University from August 2009 to July 2011, completing the requirements for Master of Science of Science in Nutritional Sciences at Oklahoma State University, Stillwater, Oklahoma in July 2011; completed requirements for Oklahoma State Dietetic Internship program at Oklahoma State University to become a Registered Dietitian in July 2011.

Experience: Dietetic Intern, July 2010 to July 2011; Employed by Oklahoma State University as a Graduate Research Assistant for Oklahoma Cooperative Extension Services, August 2010 to May 2011.

Professional Memberships: American Dietetic Association, Oklahoma Dietetic Association.

Name: Claire Grady

Date of Degree: July, 2011

Institution: Oklahoma State University

Location: Stillwater, Oklahoma

Title of Study: COMPARISON OF SHOPPING AND PURCHASING PREFERANCES
AT FARMERS' MARKETS THAT ACCEPT SNAP EBT CARDS AND
FARMERS' MARKETS THAT DO NOT IN OKLAHOMA

Pages in Study: 67

Candidate for the Degree of Master of Science

Major Field: Nutritional Sciences

Scope and Method of Study: The objective of this study was to evaluate the shopping and purchasing preferences of shoppers at two different types of farmers' markets in Oklahoma; one that accepted SNAP EBT, and one that did not. Additionally, to investigate if fresh fruit and vegetable consumption was affected based upon market type. The sample included a total of 60 participants, both male and female, who were shopping at the markets; there were a total of 30 participants from each market. The sample was a convenience sample. Data was collected via a survey, which was handed out to shoppers within the market, and completed on site. Each market was surveyed a total of five times throughout the months of August and September 2010. Frequency statistics were used to identify how often each response was selected by the shopper for each question within the survey at each respective market. Chi-square statistics were used to identify significant differences between selected responses for survey questions between shoppers based upon market type.

Findings and Conclusions: Findings of this study indicate there were statistical differences between the demographics of shoppers at each market. Statistical differences were also observed in where shoppers from each market purchased fresh fruits and vegetables most often. Additionally, shoppers indicated they would shop at farmers' markets more often if it were located closer to home. Future research needs to be conducted to test the validity of these findings.

ADVISER'S APPROVAL: Dr. Barbara Brown
