EATING AND FOOD BUYING BEHAVIORS OF CALFRESH PARTICIPANTS
WHO USE THEIR EBT CARD AT FARMERS MARKETS

A Project

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by
Daniel Wilson
Veronica Ceja

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Division of Social Work
Abstract

of

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Veronica Ceja

This study explored the ways in which wireless EBT card terminals at farmers’ markets affect CalFresh participants’ eating and food-purchasing behaviors. Researchers utilized a convenience sampling technique of fifty-eight CalFresh participants who shopped at Sacramento-area farmers’ markets between November 2012 and February 2013. This study incorporated a survey with twenty-six questions regarding participants’ eating and food-buying behaviors. Demographic data, such as gender, ethnicity, age, and neighborhood of residence was also collected. The researchers hypothesize the intervention of EBT terminals at farmers’ markets will be associated with participants’ frequency shopping at farmers’ markets and consumption of healthy foods. A paired samples t-test determined there was a statistically significant difference of -5.60 (sd=11.67, t=-3.65, df=57, p>.001) between the means of participants’ frequency shopping at farmers’ markets before using EBT at farmers’ markets (n=58, M=19.45, sd=17.46) and participants’ frequency shopping at farmers markets after beginning to using EBT at farmers’ markets (n=58, M=25.03, sd=18.21). Another t-test determined
there was a statistically significant difference of -1.08 (sd=2.30, t=-3.58, df=57, p>.001) between the means of the number of healthy meals participants’ prepared at home before using EBT at farmers’ markets (n=58, M=9.17, sd=6.70) and the number of healthy meals participants’ prepared at home after beginning to using EBT at farmers’ markets (n=58, M=10.25, sd=6.37). The researchers’ hypotheses were sustained, showing evidence that EBT access at farmers’ markets is related to increased frequency shopping at farmers’ markets and consumption of produce from farmers’ markets.

_______________________________, Committee Chair
Teiahsha Bankhead, Ph.D., L.C.S.W.

_______________________________
Date
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These last four years at Sac State have been a journey of knowledge and self-exploration and I am thankful to everyone who cheered me along this very personal experience. I particularly want to thank my daughter Balloon for understanding why mommy couldn’t always play or be the one to go over your homework, thank you for your patience and for sticking by my side through this I cannot imagine my world orbiting around a more beautiful person, I love you. Fred, your unwavering support and love of my desire to expand my vision of what I could accomplish has been the most romantic gesture of your commitment to my happiness, thank you. To my dear friend Daniel, from the first moment I laid eyes on you in our undergraduate class I was drawn to you and knew I had to meet you. You are a wonderful human being and it has been my honor to collaborate on this project with you, thank you for your love and friendship, I love you Danny.

He tenedio el previligo de saber lo que es amar a una hija y es por medio de este amor que agradesco los sacrificios y el apoyo de mis padres. Ustedes han sido mi guía y mi inspiración a querer ser una mejor persona. Dedico este logro académico a mi madre y a mi padre, sus palabras y actos de apoyo durante esta jornada han sido como besos de Dios y me han dado las fuerzas para no darme por vencida.

Veronica Ceja
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Daniel Wilson

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Chapter 1
INTRODUCTION

“You are what you can afford to eat” is a truth and a reality for many people during this time in which society embarks to offer fresh, local, and organic foods as an alternative to processed meals to all Americans. Income has been identified as one of the major contributing factors of health, and understanding the contributing factors of healthful eating in low-income populations is important to an understanding of how to improve nutritional health (Whiting, Vatanparast, Taylor, & Adolphe, 2010). Medical and dietary professionals are collectively examining poor nutrition as the source of obesity, cardiovascular disease, and diabetes (Satia, 2009). Traditionally, the blame for poor nutrition has been placed on the individual sitting in the doctor’s office or the family having dinner at a local fast food restaurant, however eating behaviors are only the symptoms of bigger issues, making the matter of what we eat much more complex than individual eating habits.

Historical evidence has substantiated associations between neighborhood availability of retail food stores and eating patterns among residents, even after controlling for individual level characteristics (Izumi, Zenk, Schulz, Mentz, & Wilson, 2011). Studies on eating behavior further corroborate individual eating habits as only marginally responsible for health problems associated with nutrition when compared to the creation of unhealthy eating environments (Satia, 2009; Izumi et al., 2011). The ubiquitous availability of fast and cheap food in communities has dramatically erased the now outdated availability and affordability of fresh produce and healthy home cooked
meals for many households. According to the research, obesity has been gradually rising in the United States for the past 20 years and the consequences have had costly effects on our healthcare system resulting in an estimated $2.6 trillion in healthcare costs in 2010 compared to $256 billion in healthcare costs thirty years ago (Flegal, Carroll, Ogden, & Curtin, 2010; Centers for Disease Control and Prevention [CDC], 2012; Centers for Medicare & Medicaid Services, Office of the Actuary, n.d.). This alarming increase in chronic disease has spawned a trend of conscious eating that is evidenced by nutrition education and an emphasis on thoughtful food preparation and consumption.

Sitting down for family meals and including fresh produce in our daily diets is the new health trend. But as society sits down to a healthier meal, it has become apparent that not everyone is eating or even present at the table. Research shows that being of lower socio-economic class is a risk factor for poor dietary habits and for low consumption of fruits and vegetables (Cassady, Jetter, & Culp, 2007; Song, Gittelsohn, Kim, Suratkar, Sharma, and Anliker, 2009). Critics have been quick to point out that only those within the upper economic class have been given the facility to access fresh, local, and unprocessed foods, thus highlighting the issues of affordability and accessibility within this current food revolution. New measures are being taken to promote healthy food availability in low-income communities; one such measure is the Electronic Benefits Transfer (EBT) card which has replaced food stamps as a new tool with greater variety of use. This study explores the eating consumption behaviors of Cal Fresh participants who use their EBT cards at farmers markets to examine if the intervention of increased healthy food access influences eating behaviors. The
explorations of eating behaviors and the social environment have become a common
theme in research and the development of food access interventions (Cassady et al., 2007;
Story, Kaphingst, Robinson-O'Brien, & Glanz, 2008; Whiting et al. 2010).

**Statement of Collaboration**

The efforts put forth for the fulfillment of this exploratory study were a
Collaborative effort on behalf of Masters of Social Work students, Daniel Wilson and
Veronica Ceja. This collaborative study included volunteering at the farmers’ markets in
an effort to facilitate the non-profit corporation’s efforts to increase food access to Cal
Fresh participants through EBT terminals. Volunteering at the farmers’ markets also
offered both student researchers a platform from which to reach the study population for
the purpose of data collection. Data analysis and data entry into the Statistical Package
for the Social Sciences (SPSS) program was in the same way a joint effort undertaken by
both student researchers. Subsequently, the student researchers collaborated on the
written portion of this study which included chapters one through five and was overseen
by Thesis Advisor, Dr. Teiahsha Bankhead.

**Background of the Problem**

The effects of limited and unaffordable nutritious food in low-income
communities have outgrown the confinement of low-income environments, affecting not
only low-income citizens, but all Americans. Low socio-economic environments have
become “food deserts” in the presence of economic depletion and disinvestment.
Residents of these vicinities are often left to fend for themselves with inadequate
resources and access to institutions of health and well-being. As investment in these
communities runs dry, so too do big brand name grocery stores and food markets, leaving behind small convenience stores and family owned food markets to supply entire communities with food. Often times, the food supply is determined by demand and, in turn, demand is determined by the limited food income that residents must use on food items that are prioritized as being long lasting, filling and affordable rather than fresh, nutritious, and holistically beneficial. Disenfranchised communities have become the nucleus for cardiovascular disease, diabetes, and obesity, all of which are consequences of an unequal distribution of health education and fresh food access.

Unlike middle and upper class communities that have the financial resources and access to avoid the effects of preventable disease, low-income environments have structural barriers engineered by the effects of poverty, which keep nutritious food access at bay. Research has indicated that the urban minority population of the United States has disproportionately higher numbers of obesity and other chronic diseases associated with an unhealthy diet (Gittelsohn, et al., 2008). The overall price tag of obesity for Americans was $147 billion dollars in 2008 compared to $78.5 billion a decade prior (Finkelstein, Trogdon, Cohen, & Dietz, 2009). The full expense is shaped by factors that include direct medical costs for diagnosis and treatment of Type II diabetes; heart disease and hypertension; loss of productivity at work due to absenteeism because of obesity-related health issues; disability leave; and premature death due to obesity (Hammond & Levine, 2010). This issue has revealed that the injustice of depriving low-income communities of nutritious food has not only plagued a segmented population with chronic disease, but negatively impacted the entire nation with the high cost of reactive treatment.
Statement of the Research Problem

A study from *The Journal of the American Dietetic Association* found that well-intended interventions aimed at increasing food access to low-income residents have not succeeded in narrowing the gap of produce consumption between high and low-income consumers (Cassady et al., 2007). This study adds to the limited research on EBT terminals in farmers markets to explore the success it has had in influencing CalFresh participants eating and shopping behaviors. Existing research suggests that EBT terminals provide farmers markets with increased market revenue but only infer to the possibility of EBT terminals broadening food access for low-income consumers (Bertmann, Ohri-Vachaspati, Buman, & Wharton, 2012). Studies have indicated that price, transportation, and availability are barriers within economically depressed environments; the lack of research into the effectiveness of existing interventions leaves many to wonder if healthy food interventions are indeed creating a more equitable and healthy food environment.

Purpose of the Study

In an effort to increase the limited research on existing micro-level interventions aimed at increasing healthy food access, this study explored the specific intervention of EBT terminals in farmers markets. This study investigated the eating and food-purchasing behaviors of CalFresh participants’ that use their EBT cards at five Sacramento-area farmers markets. The results of this study may be used for further research on the topic of low-income food access and will be offered to the local non-profit community corporation that operates the wireless terminals in the Sacramento area.
farmers markets. This study will provide the local non-profit corporation with empirical data as to their efforts in creating a more just and equitable food market environment.

**Theoretical Framework**

The student researchers’ motivation for contributing to the creation of an equitable food environment through study is informed by a Solidarity Economy framework (Van den- Berk & Pyles, 2012). A Solidarity Economy framework seeks to offer relief from neo-liberal practices which value social capital and asset building over a community’s well being. Neo-liberal practices have accelerated the economic depletion in lower socio-economic environments where sources of health and well-being have also diminished and created a petri dish of unhealthy dietary behavior and consequent disease, reactive treatment, and enormous health care expenditure. A Solidarity Economy approach sharply diverges from customary and accepted neo-liberal methods and looks to organize and increase community solidarity with the practice of environmental sustainability, equity, and community welfare. This framework promotes an awareness of healthy and nutritious foods with increased access driven by community welfare not financial profit. A Solidarity Economy approach creates communities that are self-governing, anti-oppressive, and non-hierarchal, concerned mainly with attaining a high level of human functioning (Van den- Berk & Pyles, 2012).

Another theoretical framework that is useful in understanding the interplay of the multiple influences that shape eating behaviors is the ecological perspective (Story et al., 2008). Story, Kaphingst, Robinson-O'Brien, and Glanz, (2008) explain that the ecological approach can be used to guide further food access research and interventions
because of the emphasis on multi-level linkages, the relationship between multiple factors that impact health and nutrition, and the focus on the relationships between people and their environments. This study makes use of the ecological framework to understand the relationship between presented food access interventions and the environmental level from which they intervene to influence eating behaviors. We hypothesize that the intervention of EBT terminals at farmers markets provides Cal Fresh participants greater access to healthy foods which, in turn, improves their consumption of fresh produce and impacts their food shopping behaviors.

**Definition of Terms**

The following is a list of definitions for keywords and terms used in this study.

**CalFresh Program**

The CalFresh program is a federally funded program formally known as *Food Stamps* and federally known as the *Supplemental Nutrition Assistance Program (SNAP)* (United States Department of Agriculture [USDA], 2012a). The program is offered to income eligible citizens to assist with the household food budget.

**Electronic Benefits Transfer (EBT)**

EBT is an electronic system through which benefits are issued to eligible Cal Fresh participants on a monthly basis. Participants then have access to the benefits through their CalFresh issued plastic card and are able to use it at participating locations.

**Thrifty Food Plan (TFP)**

The TFP is the minimal cost food plan that Snap benefits are based on. The plan reflects current nutrition standards and guidelines, the nutrient content and cost of food,
and consumption patterns of low-income households (USDA, 2012a).

**Food Access**

Food access is defined as food sources and accessibility within the physical and social space of communities (United States Department of Agriculture [USDA], 2012b).

**Community Supported Agriculture (CSA)**

CSA is a partnership between a farmer/grower and consumers where consumers pay an annual fee up-front in exchange for a weekly share of the future harvest. The main idea of a CSA is that growers and consumers share together in the food bounty as well as the risk natural in its production (Goland, 2002).

**Farmers’ Markets**

Farmers’ Markets are food sources composed of local farmers and food merchants who sell a variety of seasonal produce and food goods such as meats, breads, eggs, honey, etc.

The terms *SNAP, EBT*, and *CalFresh* will be used interchangeably in the following chapters by the researchers, as they are variations of how the same supplemental nutrition assistance program is implemented.

**Assumptions**

The concept of creating an accessible and healthy food environment in economically depleted communities is a concept that benefits all communities. Because medical research has linked chronic disease to nutrition and poor eating habits, we can no longer neglect the nutritional health of all socio-economic classes affected by food access. Further action in the form of research and the effects of food access interventions
must be taken to address the economic barriers confronted in low-income communities in a comprehensive way.

**Justification**

The knowledge derived from this study may be used to inform the evidence-based practice of social work in the arena of community organizing. The Solidarity Economy framework can be referred to by social workers deconstructing the social environments of clients to better understand the multi-level factors that create issues in low-income environments. This approach offers a practical means by which to practice social work's unique values of social justice, dignity and worth of people in view of the framework’s promotion of economic and social development through the use of non-oppressive, non-hierarchal methods. The conclusions of this study can serve to enlighten social workers as to the appropriate interventions to use when addressing healthy food necessities with individuals, organizations, and entire communities.

**Limitations**

This study was exclusively an exploratory study to assess the effectiveness of wireless EBT terminals at farmers markets in affecting CalFresh participants’ eating and food-purchasing behaviors. Researchers did not intervene in the policies or procedures of the five Sacramento area farmers markets, the local non-profit community development corporation that coordinates the EBT terminals at these farmers’ markets, or the Cal Fresh Program involved and/ or referenced in this study. Because the identity of the participants in this study was protected by the confidentiality measures outlined in the consent form, participants were not solicited for further information by researchers.
The distributed survey was limited to those who could speak English or Spanish with Spanish speakers’ participation facilitated by one of the study’s researchers who was able to translate the survey for monolingual participants. The data collected from this study will be offered to the community development corporation that operates the wireless terminals at farmers markets, as a way of contributing to their efforts of creating a more equitable food environment.
Chapter 2

REVIEW OF THE LITERATURE

The following literature review highlights common themes associated with food access research of eating behaviors and the social environment with specific focus on the methods and outcomes of food access interventions in low-income environments. The research review will begin with findings, which indicate that environmental characteristics of economically depleted environments create barriers to healthy food access. Price and income barriers, followed by proximity to grocery stores and transportation organize the section discussing food access barriers. The subsequent section ends the problem-focused section of this literature review with discussion on dietary health disparities evidenced through the research.

The section on interventions that seek to address food access is comprised of subsections on public policy and legislation, and continued with community level interventions including supermarkets, corner food stores, neighborhood markets, and convenience stores. Community level interventions are continued with subsections discussing community supported agriculture, urban food stands, nutrition classes and education, food banks and food pantries, community gardens, and the Woman, Infants, and Children (WIC) program. The research review ends with a presentation of the research on Electronic Benefit Transfer (EBT) access at farmers’ markets. The chapter concludes with gaps in the literature and how the current study fits with the previously established body of literature.
Barriers to Healthy Food Access in Economically Deprived Environments

In the open parking lot of a shopping center that normally caters to consumers in need of car repairs and fast food indulgences, sits a farmers market that operates every Thursday from eight in the morning to twelve in the afternoon. Residents from different communities and area codes approach the farmers market in search of the fresh produce selection. Residents from low-income urban areas are normally restricted to what is being offered at corner convenience stores and local markets. Investigative research of Baltimore city’s low-income vicinities found that healthy food options were poorly available and therefore, local consumers purchased less healthy options and prepared foods in ways that added fat and decreased overall nutrition (Gittelsohn et al., 2008). These limited food choices were found to restrict the diet and health of residents, as well as their ability to join a social change in eating behavior.

Responding to the need for a better understanding of characteristics of low-income environments and the nutritional barriers for citizens in low-income urban communities, several studies investigated urban poverty in America and described many communities as lacking stable employment, opportunities for mobility, investment in the community, and access to resources such as supermarkets (Tickamyer & Duncan, 1990; Izumi et al., 2011). According to a study by the United States’ Department of Agriculture’s (USDA) Economic Research Service, access to supermarkets was described to be within a one-mile radius of most low-income homes, in which 23.5 million Americans (including 6.5 million children) were considered to be low-income (Ver Ploeg
et al., 2009). A formative study of the impact corner convenience stores have on the dietary behaviors of low-income environments was conducted in Baltimore, Maryland. The study used 17 conversational interviews with customers, 10 interviews with shopkeepers, and 11 food store assessments on randomly selected census tracts throughout Baltimore City to assess healthy food access in these areas. The data revealed, of those using corner stores, 33% go three to four times a week, and 33% go one to two times a week, demonstrating that neighborhood stores offer the perfect platform from which to provide healthy food interventions and impact the eating behaviors of marginalized communities because of how often residents frequent these shopping venues. The high consumer usage of corner and small stores in low-income areas designates this characteristic of the food environment an important food source that requires further study (Gittelsohn, 2008). Impoverished Communities, like those of Baltimore City, seat residents in “socially and spatially isolated seats and makes them particularly vulnerable to adverse effects from structural economic change” (Tickamyer and Duncan, 1990, p.67). Food access advocates recognize that increasing access to fresh food nationwide in the form of farmers markets and grocery stores, will simultaneously stimulate economic growth and address the structural economic barriers of food access (USDA, 2012b).

An additional study of 919 ethnically diverse adults living in three of Detroit’s low-to-moderate income community’s participated in a survey used in conjunction with a fresh fruits and vegetables audit of 304 food stores (Izumi et al., 2011). The data from the surveys and food store audits were used in a cross-sectional design part of a larger
analysis of the relationship between observed neighborhood availability and individual consumption of dark-green and orange vegetables. The analysis found that individuals residing in neighborhoods with multiple opportunities to buy dark-green and orange vegetables consumed 0.17 more daily servings of these foods compared with individuals living in areas with no neighborhood store selling five or more varieties of dark-green and orange vegetables (Izumi et al., 2011). This study demonstrates that access to a wider selection of fruits and vegetables increases individuals’ consumption of fresh, healthy produce.

**Price and Income Barriers**

Although the Supplemental Nutrition and Assistance Program (SNAP) claims it primarily responds to economic meltdowns with financial assistance for food, the program also responds to the needs of a population living in poverty irrespective of the country’s economic status (USDA, 2012a). SNAP provides monthly financial assistance for food and nutrition supplementation to low-income applicants who meet income eligibility guidelines. The allotted financial assistance varies based on participant’s earnings unless they have no income in which case the full-benefit amount is distributed. According to the USDA (2012a) SNAP benefits are based on a Thrifty Food Plan (TFP) calculated by the least cost of food that is based on current nutrition standards, the nutrient content, and the consumption patterns of low-income households. In 2012 the maximum allotment for a family of four was $668 per month (USDA, 2012a). As soon as participants receive their monthly food benefits and use their EBT card at participating stores.
Concerns that SNAP participants have no realistic opportunity to join the social movement of nutrition-conscious eaters have prompted studies about the cost of eating nutritious foods on allotted SNAP benefits (USDA, 2012a; Cassady, Jetter, & Culp, 2007; Wiig & Smith, 2008; Jetter & Cassady, 2006). Recalling the focus of this section is on low-income communities, particularly those committees whose residents participate in SNAP and how food access impacts their eating and shopping behaviors, the qualitative and quantitative data presented will focus on studies within these margins. A study by Jetter and Cassady (2006) of 25 small grocery stores within rural neighborhoods in Los Angeles and Sacramento, California used the Supplemental Nutrition Assistance Program’s Thrifty Food Plan (TFP) to consider the real cost of food purchased in smaller stores against the cost of healthier foods. The methods used by Jetter and Cassady (2006) found that for a 2-week shopping list, the standard TFP market basket expense was $194 and the healthier market-basket cost was $230. The higher cost of the healthier basket is equal to about 35% to 40% of low-income consumers’ food budgets of $2410 a year which was calculated by the researchers when selecting participants from neighborhoods in zip code areas where the annual median household income was between $17,600 and $27,000 (Jetter & Cassady, 2006). Jetter and Cassady (2006) used the $27,000 per year cap because it is about 135% above the poverty level for a family of four, and households become eligible for the SNAP when they fall below 135% of the poverty level. The study demonstrates that SNAP participants’ access to a nutritious and balanced diet is unrealistic when the TFP market basket that is used to calculate SNAP benefits is based on inaccurate costs of healthy foods. When participants of this study were asked about
their biggest barriers to buying healthy food options, they expressed lack of availability and high prices posed barriers to consuming healthier food options (Jetter and Cassady, 2006). The high cost of nutritious foods forces SNAP participants to sacrifice healthier options, like fresh fruits and vegetables, when making meal plans on an allotment of benefits and a limited food income.

Cassady, Jetter, and Culp (2007) explored how the price barrier affected low-income families consumption of fruits and vegetables. The study discussed previous research and prices paid for food in low-income neighborhoods, food prices in low-income neighborhoods help form a part of the calculation that creates the U.S. Department of Agriculture’s Thrifty Food Plan. The study also pointed out that the TFP is designed around the minimum recommendations of the 1995 Dietary Guidelines for Americans that may be achieved by a family of four on a modest budget or by food stamp recipients (Casady et al., 2007). The study’s acknowledgement of outdated dietary guidelines used to determine supplemental food benefits, points to one of the reasons low-income families are unable to purchase fruits and vegetables with SNAP benefits.

A study that examined the effects of price on healthier low-fat snacks in vending machines revealed that reducing the prices of lower fat vending machine snacks at secondary schools increased the purchases of these healthy food options (French et al., 2001). The study added low-fat snacks to 55 vending machines at 12 middle schools and observed the purchase pattern for 12 months; the results concluded that price reductions of 10%, 25%, and 50% were associated with an increase of 9%, 39%, and 93% respectively (French et al., 2001). Because fast and convenient snacks contribute to a
diet high in fat and have the potential to change dietary habits, the outcomes of the lower fat snacks in vending machines advance and support data that identify price as a barrier for low-income people who want to eat healthier food options.

Another supplemental assistance program that is trying to break the price barrier for its participants is the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). In 2001, 602 women enrolling for WIC services at three program centers in Los Angeles were selected to participate in a study that assessed the intervention of produce vouchers in increasing fruit and vegetable consumption of participants. Herman, Harrison, Afifi, and Jenks (2008) explain that the issue of proximity to fresh produce was controlled by ensuring that participants’ were close to a major supermarket and a year-round farmers’ market was within walking distance (less than one half mile) of each of the three WIC centers in areas where the participants usually shopped. Herman et al. (2008) revealed that participants’ intake of fruits and vegetables increased and continued for six months after the study concluded. Farmers’ market participants’ fruit and vegetable consumption increased at a higher rate when compared to supermarket participants. Farmers’ market participants also shared a sentiment of the produce at their site being fresher and of higher quality when compared to the supermarket produce (Herman et al., 2008). The study substantiates that price and quality of produce affects the consumption of fruits and vegetables for participants’ who receive supplemental nutrition assistance.

Studies on nutrition and food access frequently recommend that public policies and legislation consider strategies to reduce economic barriers to meeting dietary
guidelines including “distributing discount coupons for fruits and vegetables, increasing the food stamp allocation to better support the 2005 Dietary Guidelines recommendations, and promoting low-cost sources of produce such as farmers’ markets and community supported agriculture” (Cassady, et al., 2007, p.1915). An updates perspective on behalf of policy makers, including aspects of the changing economic environment and its impact on food access, could help to dismantle the price barriers for SNAP participants and improve dietary habits.

**Proximity and Transportation to Food Sources**

Transportation and proximity to fresh produce is an important factor when considering access to fruits and vegetables. That is why research reiterates the importance of corner and small stores in low-income residents’ access to healthy foods (Song et al., 2009). The investment and relocation of supermarkets in more economically influential neighborhoods leaves residents of low-income areas dependent upon corner stores and convenience stores for their day-to-day food purchases (Gittelsohn et al., 2008). Corner stores and small stores are frequently stocked with a limited or nonexistent selection of quality produce when compared to larger supermarkets located outside of these communities. Wigg and Smith (2008) conducted a study of 14 focus groups of low-income women with children on a food stamp budget that examined the interaction of personal, behavioral, and environmental factors and the influence they have on shopping behavior through a questionnaire and budgeting activity. Using a quantitative grocery shopping activity that illustrated how food purchases were prioritized; participants were asked to indicate which food items they would purchase
from a 177-item list on a budget of $50 for a one-week period, an amount chosen based on the average household food stamp allotment in 2005 (Wigg & Smith, 2008). The study found that shopping behaviors were mainly influenced by economic and environmental situations rather than by personal choice; among the most influential determinants of shopping behavior were transportation and store accessibility (Wigg & Smith, 2008).

While these studies conclude that the complexity of eating behaviors is influenced by a variety of personal and environmental factors, the influence of capitalism in reference to food distribution and access is also subtly underscored in the power difference between upper, middle, and lower income neighborhoods’ food access. Zip codes with the most households on public assistance had more than 20 percent fewer supermarkets than zip codes with low numbers of households on assistance (Sacramento Hunger Commission, 2004). The following section will examine the issue of transportation and proximity in underserved neighborhoods and how these issues affect residents’ ability to choose and consume healthier food options in the Del Paso Heights community of Sacramento.

The neighborhood of Del Paso Heights is a low-income community that was depleted of economic growth in the 1950’s and 60’s when major job loss occurred as a result of the McClellan Air Force Base closure, Sacramento Northern Railroad streetcar line closure, and Sacramento Railyard closure (Ehrenreich-Risner, 2010). These characteristics are important to understand as they describe how economic depletion plays a role in the lack of community investment and resources such as supermarkets. In 2008 the median household income of Del Paso Heights was $29,114 when compared to
Sacramento’s household income of $47,107 and the percentage of single mothers within this community was 20% when compared to Sacramento’s 11% (City-Data.com, 2009). The 2008 economic downturn forced Del Paso Heights residents to rely heavily on the support of government aid to meet their dietary needs, unfortunately the lack of appropriate structural resources, such as supermarkets, makes the government aid inadequate.

In reference to the issue of proximity to fully supplied grocery stores and transportation, a Del Paso resident offered the following as an explanation of the unpleasant experience, "Bus drivers make up stops as they go along, they are not sensitive to the disabled and will leave you if they see you walking with kids or groceries" (Sacramento Hunger Commission, 2004). The difficulty of using public transportation for the purpose of reaching fully stocked grocery stores outside of the community is a difficulty shared among many residents in similar food contexts. A study of Baltimore’s low-income urban food environments identified corner stores as a common food source for residents who expressed dissatisfaction about the limited healthy food options available in their community’s (Gittelsohn et al., 2008). The study concluded that people living in poor urban areas were restricted to a varied and healthy diet because of environmental constraints such as distance to supermarkets, inadequacy of public transportation, and few nutritious options in convenience stores (Gittelsohn et al., 2008). The sentiment of discontent from residents of low-income urban areas in Baltimore mirrors the displeasure of many residents in the Del Paso Heights community who experience similar environmental restrictions to healthy food access.
Food Access and the Health Impact

Inadequate food access within low-income communities has resulted in the rise of obesity, diabetes, and cardiovascular disease (Story et al., 2008). Low-income populations initially bypassed in the movement of healthier, nutritious, organic, and local foods have become the target of these diseases. The USDA (2012a) recognizes that people of lower socioeconomic status are more vulnerable to obesity risk factors in relation to higher income populations. Restricted by limited health and nutrition education as well as poor access to affordable quality produce, low-income people are often disregarded, as middle and upper income people are more informed when making food choices. According to Cassady, Jetter, and Culp (2007) incorporating dark-green vegetables into diets has been linked to a lower prevalence of many chronic diseases, including lung and stomach cancers, non-Hodgkin’s lymphoma, and stroke. The physiological benefits of eating healthier and incorporating fruits and vegetables into our meals has become common knowledge and so has the recognition that a more just and equitable system which needs to be inclusive of all socioeconomic classes. As efforts are made and interventions are put into place to reduce the barriers and address the poor health of marginalized populations, SNAP is focusing on increasing food access to communities with a limited food income.

Food access involves more than access in availability, it includes sufficient access to food that meets dietary needs and promotes a healthy lifestyle. The Food and Agriculture Organization describes food security as a state that exists when all people at all times, have access to sufficient, safe and nutritious food to meet their dietary needs
and food preferences for an active and healthy life (USDA, 2012a). The USDA (2012a) identified black, Hispanic, and single parent households as having the highest rates of food insecurity. Correspondingly, the occurrence of cardiovascular disease is 40% higher in African Americans when compared to Whites (Gittelsohn et al., 2008). Satia (2009) describes the consequences of food access barriers as affecting racial and ethnic minority groups because they tend to have poorer nutrient profiles and dietary behaviors and patterns when compared to whites; often defined as diets high in fat, low in fruits, vegetables, and whole grains; and high in salt.

Research demonstrates that high rates of nutritional health problems such as obesity are synonymous with high poverty rates (Story et al., 2008). Records from the Behavioral Risk Factor Surveillance System (BRFSS) identified that low-income neighborhoods, when compared to more affluent neighborhoods, have a higher probability for coronary heart disease (Gittelsohn et al., 2008). SNAP participants with limited food budgets, in looking to get the most bang for their buck, look to buy foods that may be more filling to them and their families by placing a priority on non-perishables and meats versus more nutritious foods (Wiig and Smith, 2008). Wiig and Smith (2008) encourage efforts to offer SNAP participants food budgeting skills, meal preparation lessons with less meats and more produce, as well as nutrition education to assist low-income families in making the most of their food budget.

Nutritional guides offer a simple and structured way to address people’s everyday nutritional needs, but they do not take into consideration the barriers of healthy food access of lower socio-economic classes. The USDA’s MyPyramid, is a nutritional guide
that takes into account individuals age, gender, and activity level to create a tailored nutrition program and suggest specific daily amounts from each food group (US Department of Agriculture, 2013). MyPyramid unlike the Food Guide Pyramid advises not only a greater intake of fruits and vegetables, but also specific recommendations of vegetables, such as dark green vegetables, orange vegetables, and legumes (Guenther, Dodd, Reedy, & Krebs-Smith, 2006). These stringent guidelines outline yet another barrier for participants of nutrition assistance programs in their quest to access healthier, affordable, food with allotted food funds.

Fox and Cole (2008) studied SNAP participants and two groups of nonparticipants (income eligible and higher income) in three age groups: youth (2-18 years old), adults (19-59 years old), and older adults (60+ years old) to identify differences in the quality of diets consumed by SNAP participants and nonparticipants, as well as food preferences that contribute to these differences. The study did not disclose the number of participants involved in the study for either Food Stamp participants or the two groups of non-participants. No significant differences were discovered in the study groups’ diets concluding that Food Stamp participants’ suffer similar diet related disparities as other Americans. However, Fox and Cole (2008) findings indicated a significant difference between food stamp participants and nonparticipants total fruit and whole fruit intake. As this study and others begin to document the diet health disparities of low-income SNAP participants and begin to acknowledge that a healthy individual life cannot exist exclusively from environmental influence, new methods that confront the barriers of healthy food access are implemented.
**Interventions**

Interventions to address eating behaviors and access to healthy food in low-income communities can occur at multiple levels. Story et al., (2008) assess food environments and conditions that influence food choices from an ecological perspective and discuss possible interventions at various levels of person-in-environment. Individual factors are described as characteristics that are internal to each individual, including thoughts, emotions, behaviors, and biology. Social environmental interventions revolve around how family, friends, and peers within communities influence one another’s eating behaviors. The physical environment affects where people eat, purchase, grow, or prepare food, including homes, schools, workplaces, grocery stores, markets, and gardens. Macro level environmental interventions seek to change federal and state agricultural and nutrition policies, food marketing, social norms, production and distribution systems, and economic and pricing conditions surrounding nutrition and food. The subsequent sections will discuss community-level interventions in the physical environment, with specific focus on wireless EBT card terminals being offered at farmers markets (Story et al., 2008).

**Public Policy and Legislation**

Although public policy and legislation is beyond the scope of this study, many community-level interventions that address access to healthy food in low-income communities draw support from Federal, state, and local policies, programs, and funding streams. Price of healthy foods, proximity to businesses that sell healthy foods, and education and time commitments to prepare healthy foods are significant barriers to
healthy eating in low-income communities. Various Federal, state, and local government programs seek to address these barriers, and various studies recommend legislation and changes to public policy and programs. An expansion of these programs could dramatically increase access to fresh, health foods for low-income communities (Community Food Security Coalition and Partners, 2007). Below, specific to this study, are recommendations and current policies and programs that support farmers’ markets as one tool in addressing lack of access to fresh, health food in low-income communities.

The United States Department of Agriculture (USDA) offers several programs that help farmers connect directly to consumers. The Know Your Farmer, Know Your Food (KYF2) initiative, for example, promotes programs that help strengthen local and regional food systems. Many of these programs, such as the Farmers’ Market Promotion Program, the Specialty Crop Block Grant, and the Community Food Projects Competitive Grants Program, address lack of access to fresh, health food in low-income communities by funding projects that connect farmers to Supplemental Nutrition Assistance Program (SNAP) and Women, Infant, and Children (WIC) program participants and help build infrastructure for the distribution, promotion, and sale of healthy foods (USDA, 2012b). Many reports looking at Federal policy changes recommend the expansion of these and other food system programs that serve local food producers and disadvantaged consumers who have limited access to fresh, healthy foods (Cassady et al., 2007; Community Food Security Coalition and Partners, 2007; Briggs, Fisher, Lott, Miller, & Tessman, 2010).

Recommendations to states include creating statewide food safety plans that are consistent across counties to streamline guidelines and reduce bureaucratic confusion for
farmers’ markets operating in multiple counties. States can help promote, in county public assistance offices, farmers’ markets that accept EBT cards. States can further support farmers’ markets by facilitating coverage or directly covering the costs of EBT terminal transactions and processing fees and equipment rental through private funders and Federal grants or through state grants and funding allocated towards farmers’ markets. Partnerships between states, municipalities, community members, and public and private coalitions, councils, and organizations can further harness resources and ideas to support and promote community farmers’ markets (Cassady et al., 2007; Community Food Security Coalition and Partners, 2007; Briggs et al., 2010).

Cities and counties can make several policy and ordnance changes to promote healthy, affordable food in low-income communities. Reports have recommended cities and counties include farmers’ markets and small and mid-sized farms in planning and zoning regulations; reduce or waive fees when market coordinators are applying for permits; and develop permits specific to farmers’ markets. Other recommendations have advised in-kind or financial supports, such as EBT technical and infrastructure assistance; and facilitation of partnerships among farmers’ markets and community organizations, agencies, residents, councils, and other institutions (Briggs et al., 2010).

**Supermarkets**

Generally defined as a large store selling many varieties of produce, dairy, meat, canned, boxed, and frozen food products, supermarkets tend to be few and far between in low-income communities (Gittelsohn et al., 2008; Song et al., 2009; Community Food Security Coalition and Partners, 2007). Grocery stores are an important element in
contributing to healthy eating behaviors among residents in low-income communities. Supermarkets tend to offer a larger variety of foods at lower costs than other retail establishments that sell food. Additionally, fruit and vegetable consumption of low-income community residents increase with each additional supermarket in the neighborhood where they live (Gittelsohn et al., 2008; Song et al., 2009; Evans et al., 2012).

Conversely, other research has shown there exists little to no correlation between greater access to supermarkets versus fruit and vegetable intake. The most prominent explanation for this occurrence lies in the variety of healthy and unhealthy foods supermarkets sell and, in turn, consumers purchase (Evans et al., 2012). Regardless, few initiatives exist or have been studied that encourage the development of and investment in retail grocery establishments in low-income communities (Story et al., 2008).

**Corner Food Stores, Neighborhood Markets, and Convenience Stores**

Corner food stores, neighborhood markets, and convenience stores far outnumber supermarkets, farmers’ markets, community gardens, urban food stands, and other sources of food in low-income communities. These corner stores tend to charge higher prices and offer less variety than other sources of food, especially those in middle class communities (Song et al., 2009; Gittelsohn et al., 2008; Community Food Security Coalition and Partners, 2007). Song et al. (2009) and Gittelsohn et al. (2008) explore strategies and interventions that encourage these corner stores to sell a larger variety of affordable healthy food options.
Song et al. (2009) presents the results of the feasibility trial of a corner store intervention in a low-income urban community, including the impact on storeowners and various psychosocial factors, any operational changes in stocking the promoted foods, and the sustainability of the programs post-intervention. A sample of nine stores (2 supermarkets and 7 corner stores) in East Baltimore received the intervention and was compared to eight stores (2 supermarkets and 8 corner stores) in West Baltimore, which served as the control. The sample was accessed through the Korean-American Grocers Association, of which all stores in the sample were members. Ten healthy foods were selected to promote in the intervention based on predetermined nutritional guidelines. Additional promotional and marketing strategies were developed such as poster, flyers, displays, taste-tests, and giveaways. Data collection instruments included a questionnaire, which was implemented at baseline and post-intervention and recorded physical store characteristics and storeowners’ psychosocial factors; weekly food sales records that estimated the total dollar amount of promoted foods sold; and unstructured interviews with storeowners (Song et al., 2009).

Results showed changes in storeowners’ psychosocial variables were not statistically significant; however, owners’ expectations of sales and stocking showed a statistically significant increase. No statistically significant changes were seen between storeowners’ and supermarket managers’ psychosocial variables, but supermarket managers generally showed higher expectations of selling and stocking healthy foods. Stocking and sales of some healthy food items increased from baseline to post-intervention, and were maintained six months after the intervention. The other healthy
food items were not stocked, as storeowners’ felt they would not sell. These items show no significant increase in sales or stocking (Song et al., 2009).

Gittelsohn et al. (2008) conducted a study addressing the food sources available to City of Baltimore residents, their usage and perceptions of the food environment, their attitudes and perceptions of corner convenience stores, and possible improvements within the local food environment. The food source assessment was conducted by having graduate students survey 11 of 200 census tracts in Baltimore, identifying food sources, the layout of each source, communication challenges, and the availability of certain healthy foods. Ten storeowners and one organizational representative were selected via the Korean-American Grocers Association to interview. Conversational interviews were conducted with 17 residents via convenience sampling. A consumer survey was developed and 50 participants were surveyed via convenience sampling collected from various community organizations, a restaurant, and a church. Direct observations were also conducted in six corner stores in Baltimore to document stocked food, clientele, food purchase patterns, and other aspects of the stores (Gittelsohn et al., 2008).

In many low-income communities, corner stores are the most frequented type of food store due to proximity to residents and sheer number located within communities (Gittelsohn et al., 2008; Song et al., 2009). Gittelsohn et al. (2008) discovered that there were 10 times smaller and medium-sized food stores as supermarkets in certain low-income Baltimore neighborhoods. These smaller corner food stores offer much less variety and healthy food than supermarkets. Low demand for healthy foods, like fruits and vegetables, the need to stay profitable, and lack of refrigeration and storage ability
deters storeowners from purchasing and stocking stores with healthier food options (Gittelsohn et al., 2008; Song et al., 2009). Community residents frequently expressed frustration with the lack of food variety, especially healthy food options. Many storeowners demonstrated a genuine concern for their community residents and many were willing to provide healthier alternatives, if costs associated with carrying such items could be recovered to break-even or make a profit. This sentiment is illustrated in Gittelsohn et al. (2008) when storeowners make special purchases to meet specific requests for residents in the community.

Findings suggest that storeowners’ perceptions of community residents’ food demands, and potential monetary losses associated with not meeting demands, are barriers to storeowners offering more healthy items. Residents’ actual demands and tastes for unhealthier food options and lack of knowledge of healthier options may pose additional barriers. Building relationships and communication between storeowners and residents, stocking healthy foods, and promoting healthy foods through flyers and taste-testing may help improve sales and stocking of healthier foods (Song et al., 2009 & Gittelsohn et al., 2008).

**Community Supported Agriculture (CSA)**

Community supported agriculture (CSA), like farmers’ markets, connects farmers directly to consumers. Known as members or shareholders in CSA programs, consumers pay farmers at the beginning of the year to receive a portion of their harvest. This upfront payment creates a symbiotic relationship between members and farmers, where both parties share the risk of a bad harvest or the benefits of a robust harvest. Members
receive scheduled deliveries of produce based on farmers’ harvests, which frequently includes recipes for the included items, and farmers benefit from a stable, committed consumer-base regardless of the harvest outcome (Thompson, 2012).

Despite little empirical evidence being available exploring CSA programs as a viable intervention to address lack of access to fresh, health food in low-income communities, such CSA programs do exist. Thompson (2012) reported on a CSA program in Harlem, New York City, New York that was designed to provide low-income residents with fresh, healthy produce. Instead of shareholders paying at the beginning of the year, they pay a week in advance. All forms of payment are accepted, including EBT; shareholders can place their shares on hold at anytime, in case they do not have the funds to pay; and the produce variety includes culturally specific items. Eleven initial investors provided start-up funds for the program, 75% being African-American and Latino and 51% being women. In its first week, the program included 195 shareholders and one farmer; by its second year, the program had 450 shareholders; and by September 2012, the program was averaging 750 shareholders receiving items from 15 different farms who meet every year to devise a harvest plan. Orders are available for shareholder pick-up at 21 different sites in the city. It was noted that 1200 shareholders are needed for the program to breakeven (Thompson, 2012).

Although more research needs to be conducted, CSA programs hold a great deal of promise in providing affordable, healthy food to residents in low-income communities while helping support family farmers in more rural areas. Additionally, CSA programs
save time and energy by reducing the amount of time consumers need to spend shopping and increasing food preparation knowledge and skills through included recipes.

**Urban Farm Stands**

Farm stands are generally described as small farmers’ markets consisting of two to three farmers (Evans et al., 2012). Some farm stands are smaller, resemble mobile carts, and are operated by local community organizations. Other may be larger, resembling a small store. Evans et al. (2012) conducted a longitudinal pre-post study with no comparison group to explore if introducing small food stands, without any other intervention such as promotion or food education, in underserved communities would increase the consumption of fruits and vegetables of community members. Researchers worked with a local community organization that coordinated farmers’ markets and farm stands in Austin, Texas to establish one food stand in each of two underserved neighborhoods. The sample size was 61 due to people not wanting to participate in the study during the pre-test, and phone calls and mailers not being answered during the post-test. The study questionnaire asked participants about fruit and vegetable intake, use of farmers’ markets/farm stands, attitude and behaviors related to eating fruits and vegetables, and demographic information (Evans et al., 2012).

The results of the study showed a statistically significant increase in the amount for fruits and vegetables purchased by community members and their awareness of farmers’ markets/farm stands in their community. The consumption of whole fruit, fruit juice, and other vegetables contributed to the accounted for the largest increases of fruit and vegetable intake. The proportion of people who viewed fruit and vegetable intake as
important also increased. The increase in fruit juice, which was not sold at the farm stands, indicated the participants may have been receiving food education elsewhere about the positive health effects of healthy eating including drinking fruit juice. The increase in awareness of farmers markets implied that participants were learning about community farmers’ markets/farm stands from elsewhere, as the intervention included no advertising. Word of mouth was one suggested possibility (Evans et al., 2012). These findings underscore the importance of interventions to increase access to healthy food in low-income communities, as well as, the necessity in promoting and advertising such interventions. Results also showed that the increase in participants’ frequency in preparing meals with fruits and vegetables and the increase in participants’ families’ linking fruits and vegetables were not statistically significant (Evans et al., 2012). This could indicate the need for taste testing and demonstrations on how to prepare the food sold at farmers’ markets/food stands.

**Nutrition Classes and Education**

Nutrition educations comes in many different forms, including curriculum topics in primary and secondary schools, classes at community centers, fields of study in college programs, pamphlets and brochures, and impromptu cooking demonstrations and tasting events. Although nutrition education does not directly provide underserved communities with access to healthy fruits and vegetables, numerous studies (Evans et al., 2012; French et al., Gittelsohn et al., 2008; Hallberg, 2009; Song et al., 2009) cite the importance of nutrition education in helping families learn how to prepare and eat food that has become accessible through the other interventions discussed in this study.
Food Banks and Food Pantries

Millions of low-income Americans heavily rely upon food pantries, food banks, and other emergency food programs to meet their daily food intake needs. However, numerous studies have shown that food pantries often lack many foods that provide important vitamins and minerals. Lack of refrigeration and cold storage equipment prevents food pantries from supplying many meats, dairy products, and produce. The variability of emergency food programs’ food sources, such as individual and corporate donations, farmers, purchases, and retail store overstock, also creates limitations and inconsistency in the quality and variety of food available to program participants (Akobundu et al., 2004, Briggs et al., 2010).

Akobundu et al. (2004) conducted a study to measure the nutritional quality of provisions offered by food pantries. On-site interviews were conducted with 101 traditional food pantry participants and 32 Brown Bag for Elder (BBFE) programs from 33 traditional pantries and 8 BBFEs that were randomly selected from a list food pantries served by a larger food bank. Items in participants’ food bags were categorized, labeled, and coded base on brand, amount and size, and the number of food group servings. Data was analyzed based on the number of days an individual could meet the minimum U.S. Food Guide Pyramid (FGM)’s food group recommendations and nutrient density scores using the Index of Nutritional Quality (INQ).

The majority of the servings came from the fats, oils, and sweets group, followed by the bread, cereal, rice, and pasta group, with the least coming from the dairy group. According to FGM recommendations, items from the bread group would last the longest,
followed by items from the vegetable and protein groups, with items from the fruit and dairy groups. Protein, fiber, iron, folate, total and saturated cholesterol had INQ values that were within dietary recommendations, but food pantries were lacking calcium, Vitamin C, and Vitamin A. Lack of storage infrastructure and consistent donors and donations limits the availability foods with these nutrients in food pantries (Akobundu et al., 2004). Although interventions and government programs exist to help food pantries, food banks, and other emergency food programs procure and store fresh fruits and vegetables; little research is available to evaluate the efficacy or impact of these government programs and the resources they help build.

Community Gardens

Community gardens are shared plots of land where community residents grow food for their own consumption or sell to other residents. The development of community gardens is usually coordinated by community organizations, local government programs, schools, or groups of community residents, and the land is usually owned by local government in the form of a park, community center, or school. The organizing group frequently offers educational and technical assistance regarding growing, gardening, and cooking, along with other social and community events that focus on the produce harvested from the garden (Castro, Samuels, & Harman, 2013; Hallberg, 2009).

Castro, Samuels, and Harman (2013) conducted a pilot study to evaluate a community initiative that sought to prevent childhood obesity through community fruit and vegetable gardening, and nutritional and cooking education among low-income
families in a neighborhood of Chapel Hill, North Carolina. The study contained three different measures: height, weight, age, and Body Mass Index (BMI) of the children; number of fresh, frozen, and canned fruits available in participants’ homes; and number of children’s servings of fresh, frozen, and canned fruits and vegetables per day. The sample included 60 families with a total of 120 children, averaging 4 people per family. Data was collected before program implementation and at administrative points over three growing seasons.

For the first measurement, the results shown that all of the children’s BMI either improved or stayed the same. Of the 95 children who were old enough to have their BMI measured, 36 fell under the classification of obese or overweight. Six of these children improved their BMI classification from obese to overweight or overweight to normal.

For the second measurement of fresh, frozen, and canned fruits and vegetables available to children in their homes, a total of 48 of the 60 families completed the pre-and post-self report survey. Results showed that from pre-program to post-program, the average availability of fresh, frozen, and canned fruits to children in their homes increased 146%, and the average increase for fresh, frozen, and canned vegetables was 123%. For the final measurement, 48 families reported at pre- and post program regarding the number of servings of fruit eaten by children per day, and 46 families reported as to vegetables. The average number of servings of fruits eaten by children on a typical day increased by 28% and, vegetable consumption increased by 33% (Castro et al., 2013).

The results from this study correspond with the results from other studies, which also show participation in community gardens increase individuals’ fruit and vegetable
intake, specifically when paired with technical assistance and nutrition education (Castro et al., 2013; Hallberg, 2009). This study also illustrates how community gardens, through the interaction of residents in the garden and at education and social events, can be used to organize and build community relationships. They can also be a method of brown field remediation and beautifying open, undesirable plots of land (Castro et al., 2013; Hallberg, 2009).

**Women, Infants, and Children (WIC)**

Herman et al. (2008) explored whether offering additional funds for WIC participants to purchase fruits and vegetables would yield higher rates of fruit and vegetable consumption. In the study, 602 women were recruited from three Los Angeles WIC offices. The women were divided into one control group and two intervention groups based on similar demographic characteristics. After a two-month baseline period to establish a pattern of behaviors, participants in one group were given vouchers for farmers market in ten dollar increments bimonthly for 6 months, the other intervention group was given for supermarkets in ten dollar increments bimonthly for 6 months, and the control group was given $13 per month as compensation for participating in the study. Interviews were conducted six times in the two intervention groups and 4 times in the control group at various stages of the study, including baseline, 2 months after baseline, at the end of the 6-month intervention period, and 6 months after the intervention period.

Expanding the WIC program to include subsidies for fruit and vegetables, not just formula, milk, eggs, bread, cereal, baby food, and some other items, would expand
participants’ access to and consumption of fresh fruits and vegetables. In the study conducted by Herman et al. (2008), WIC participants in the two intervention groups who were provided additional funds to purchase fruits and vegetables from farmers’ markets and supermarkets consumed more produce 6 months after the baseline period, which was more than the control group. This trend was sustained 6 months after the intervention period.

Black et al. (2009) sought to examine Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) participant’s responses to the Institute of Medicine’s recommended changes in WIC food packages. The study also sought to identify ethnic and racial differences and assess costs. The cross-sectional study was conducted during the summer of 2007 and consisted of focus groups and interviews with 223 WIC participants across the state of Maryland. The sample was collected from five Maryland counties that varied in terms of ethnic make-up and location, and participants were selected from various WIC sites by asking if they would like to take part in an individual interview or a focus group. Participants had to be a WIC recipient, at least 18 years old, a English or Spanish speaker, and either pregnant or caring for a WIC-enrolled child or infant. Measures included a basic demographic questionnaire on age, education, and household composition. An interviewer-administered food questionnaire was conducted asking participants about current consumption habits and how consumption would change with the revised WIC packages. The questionnaires were distributed in three different forms based on the corresponding WIC package, including pregnant, breastfeeding, and postpartum women; infants; and children. A grocery store inventory
was conducted on two stores that accepted WIC in each of the five Maryland counties. Six focus groups were conducted using open-ended questions based on the questionnaire (Black et al, 2009).

The results from both the focus groups and the questionnaires showed that most of the WIC participants would purchase more frozen, fresh, canned, or jarred fruits and vegetables if WIC provided vouchers. The participants reported taste and cost influenced the produce they chose to purchase. Most stated fresh fruits and vegetables as the more healthy options, but preferring frozen due to ease of preparation. Additionally, the study conjectures that providing nutritional education around fruits and vegetables in addition to providing vouchers may increase produce consumption as well (Black et al, 2009).

**Farmers’ Markets**

As public awareness and concern have developed around where and how food is produced, so too has demand for locally, organically grown food. These consumer-driven trends have opened more funding opportunities and subsidies for small family farms and farmers’ markets, thus making farmers’ markets an increasingly viable tool for improving access to fresh, healthy food in low-income communities. For example, the number of farmers’ markets increased from 1,755 in 1995 to 5,274 in 2010 (Briggs et al., 2010). In 2010, SNAP benefit redemption at farmers’ markets increase by 70 percent in just one year, but only accounting for .012 percent of SNAP redemption nationally (Community Food Security Coalition and Partners, 2007). Despite increasing awareness and funding for farmers’ markets to provide health affordable food to low-income
communities, only limited research has been conducted studying the affects of offering wireless EBT card processing terminals at farmers’ markets.

**Electronic Benefit Transfer (EBT) at Farmers’ Markets.** Bertmann, Ohri-Vachaspati, Buman, & Wharton (2012) conducted a study to explore the effects of wireless EBT terminal use on sales at farmers’ markets. By emailing 38 market managers in Arizona, 5 outdoor, urban farmers’ markets agreed to participate. Sales were collected over a 10-week period in 2009 prior to implementation of wireless terminals and over the same 10-week period in 2010 after the implementation. The data collected over the 20-week period was analyzed for any before-and-after effects.

The study found that wireless Supplemental Nutrition Assistance Program (SNAP) benefit processing stations increase the sales of vendors at farmers markets, and in most cases, the increase in sales exceeded the cost of the wireless terminals (Bertmann et al., 2012). Many farmers markets lack the equipment necessary to process card-based transactions (Bertmann et al., 2012). Lack of electricity, wireless signal, cost, and battery life pose significant barriers to implementation of SNAP benefit redemption at farmers markets (Bertmann et al., 2012). To offset these barriers, some states offer farmers markets free or subsidized wireless processing terminals, which increases the financial viability of SNAP benefits being accepted at farmers markets as an intervention to increase low income communities’ access to fresh, affordable, health produce (Bertmann et al., 2012). Federal grant programs through the United States Department of Agriculture (USDA), such as Farmers Market Promotion Program (FMPP) and the Specialty Crop Block Grant, have awarded millions of dollars to states, farmers’ markets,
and non-profit organizations. In 2010, Congress targeted ten percent of the FMPP’s funds would go to providing EBT access as farmers’ markets, and with $5 million in grant being awarded, Congress’ goal was far exceeded. Between 2010 and 2011, EBT card usage at farmers’ markets and food stands grew by 51% to over 2,400 locations (USDA, 2012b).

Buttenheim, Havassy, Fang, Glyn, and Karpyn (2012) sought to compare the effects of multiple, vendor-operated wireless EBT card processing terminals versus single, market-operated EBT card processing terminals on vendors SNAP/EBT sales. The study focused on one farmers’ market in West Philadelphia, Pennsylvania, which began accepting SNAP benefits via EBT processing in 2004 using a single, market-operated terminal. In 2008, the market received grant funding from the FMPP to install multiple, vendor-operated wireless point of sale (POS) terminals. The funding covered the costs of the terminals as well as the fees associated with the wireless coverage, transaction fees, and processing fees for SNAP/EBT card, debit card, and credit card sales from June 2008 to February 2009. The vendors were trained to use the wireless terminals and the pilot program was promoted at the market and through broader marketing campaigns. The farmers’ market returned to a single, market-operated terminal after the pilot period ended.

The results from the regression model analysis showed that monthly EBT sales were associated with the pilot program with an increase in EBT sales of 38% per month. A second model evaluated whether the results of the pilot were seasonally dependent by replacing the variable that included all months of the pilot with variables divided by
season. Results imply most of the increase in EBT sales occurred within the fall months with increases in the summer and winter months that were not significant. The third, and final, model evaluated the persistence of the intervention results after the pilot period ended. No evidence was found to indicate the effects of multiple, vendor-operated wireless EBT terminals persisted beyond the pilot period. The coefficient of a placebo indicator, based on the nine pre-pilot months, shown to not be significant, which further supported the findings of increased EBT sales associated with the pilot program (Buttenheim, 2012).

**Gaps in Literature**

In recent years, underserved communities’ lack of access to fresh, healthy produce has gained recognition, especially in light of the growing numbers of overweight Americans, the increasing focus on wellness and prevention, and the passage of the Affordable Healthcare Act of 2008 (Flegal, Carroll, Ogden, & Curtin, 2010; Centers for Disease Control and Prevention [CDC], 2012; Centers for Medicare & Medicaid Services, Office of the Actuary, n.d.). Many community-based organizations and government programs at the Federal, state, and local levels are beginning to fund organizations and initiatives that seek to address issues of healthy food access in low-income communities. However, little research exists that evaluates these programs and interventions. Much of the research is limited in complexity, design, sample size, and longevity (Bertmann et al., 2012), and therefore experiences limitations in being generalized as effective interventions to address lack of food access nationwide. Further research could increase sample sizes and duration of studies.
Research seeking to understand the effectiveness of wireless EBT card processing terminals is particularly scarce. Previous studies have focused on the effects of wireless EBT terminals and its impact on vendors’ sales with little mention or understanding of the effects on consumers’ health and food choice behaviors (Bertmann et al., 2012; Buttenheim, 2012). Additionally, participants and consumers’ perspectives have rarely been studied in regards to the various interventions addressing food access in underserved communities. This study seeks to address this gap in literature by analyzing the perspectives and behaviors of CalFresh participants who use their benefits at farmers’ markets.

**Summary**

Research regarding lack of access to healthy food has indicated that socioeconomic status is a major determinant of dietary choices made by individuals in regards to how they eat and where they shop. Critiques have pointed out that attempts to link local food to health outcomes have disregarded the needs of low-income consumers who have not had an opportunity to participate in a healthy food movement that appeals mainly to those with financial means, labeling these healthy initiatives as elitist and exclusive (McEntee, 2010). Whether due to an absence of nutrition education, a lack of access to healthy foods, income restrictions, or high costs of healthy food options, poverty was found to be a common theme in the research of food access barriers and dietary behaviors in our country (Satia, 2009; Izumi et al., 2011; Tickamyer & Duncan, 1990).
Food access interventions have found stratified opportunities for affecting eating behaviors and access to healthy food in low-income communities. Support for community interventions has been found in research data which has indicated that living in a neighborhood with multiple opportunities to purchase produce may make an important contribution to influencing eating behaviors of low to moderate income citizens (Izumi, 2011).

The findings presented suggested multi-level interventions such as collaborative partnerships between states, and public and private organizations to support and promote community farmers’ markets, building relationships and communication between storeowners and residents in an effort to increase the stocking of healthy foods, promoting healthy foods through flyers and taste-testing which may help improve sales of healthier foods in low-income corner stores, as well as promoting and advertising such interventions. These food access interventions expect to achieve food security in a community context as a situation in which all community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a suitable food system that maximizes community self-reliance and social justice (Hamm and Bellows, 2003 as cited in McEntee, 2010).

This study’s literature review was composed with the purpose of informing the reader of the current research themes of eating behaviors, environmental food access barriers, as well as the methods and outcomes of food access interventions in low-income environments. The literature review was organized in support of this study’s aim to explore the narrowly navigated eating and shopping perceptions of CalFresh beneficiaries
in order to better understand the effectiveness of EBT terminals in farmers markets as an intervention of fresh food access. The limited research into CalFresh beneficiaries’ food access has identified that the high cost of healthy foods is a deterrent to selecting and consuming healthier foods (Jetter & Cassady, 2006; Wiig & Smith, 2008). This study’s exploration into the perceptions of CalFresh participants who use the Electronic Benefit Transfer Terminals at farmers’ markets seeks to add to the research that informs healthy food access interventions in low-income communities.
Chapter 3

METHODOLOGY

This study focused on the ways in which wireless EBT card terminals at farmers’ markets affect CalFresh participants’ eating and food-purchasing behaviors. As previously stated, many low-income communities lack access to fresh, healthy, and affordable fruits and vegetables. Although many interventions attempt to address this need, only sparse literature exists that evaluates the successes of this intervention. In this study, it was important to explore the efficacy of wireless EBT card terminals at farmers’ markets in providing low-income individuals with greater access to fresh, healthy, and affordable produce. It was also significant for this study to add to the limited research on interventions that seek to address lack of healthy foods in low-income communities. The findings presented in this study may be useful for community development organizations, government agencies, and community residents seeking to implement a new intervention or apply for grant funding that addresses lack of healthy foods in low-income communities.

Study Design

This exploratory, mixed methods research study utilized a convenience sample of CalFresh participants who shopped at farmers’ markets between November 2012 and February 2013. This study incorporated a survey with twenty-six questions (see Appendix B) regarding participants’ eating and food-buying behaviors before and after beginning to use their EBT cards at farmers’ markets. Demographic data, such as gender, ethnicity, age, and neighborhood of residence, was also collected. A local community
development corporation that participates in Sacramento-area farmers’ markets as a third party, processing EBT card transactions for CalFresh participants, provided the researchers with access to the farmers’ markets and prospective participants (see Appendix A).

**Population and Sampling Procedures**

The population under consideration in this study is CalFresh participants who shop at farmers’ markets. This study seeks to understand eating and food-buying behavior changes of the population resulting from the availability of EBT card access at farmers’ markets. The sampling plan for this study included a sample of fifty-eight participants who were recruited at five Sacramento-area farmers markets. Shoppers who utilized the wireless EBT card processing station to access their CalFresh benefits were invited to participate in this study. Criteria for inclusion included CalFresh program enrollment and utilization of benefits via EBT card transaction at one of five Sacramento-area farmers markets. Individuals under the age of eighteen and individuals who did not speak English or Spanish were excluded due to the legalities of minors signing consent forms and the lack of translation services. Two dollars in cash were used as an inducement for participation in the study and completion of the survey.

**Data Collection Procedures**

Data collection for this study involved the development of a survey with questions regarding participants’ eating and food-buying behaviors before and after beginning to use their CalFresh benefits at farmers markets. Upon arrival to the EBT processing station at one of five Sacramento-area farmers’ markets, volunteers completed
the prospective participants’ EBT transaction and issued the corresponding amount of vouchers to be spent with vendors who accepted the vouchers. After the completion of the transaction, prospective participants were asked if they would like to receive two dollars in cash for completing a survey. Upon agreement, the researchers provided prospective participants with a verbal summary and a paper copy of the consent form (see Appendix C). They were asked to sign the consent form if they agreed to its content. After returning the consent form, the participants were given the survey to complete and the two-dollar cash inducement was offered after completing and returning the survey. Surveys and consent forms were stored in two different folders to maintain anonymity between the two documents.

**Instruments**

Participants were asked to complete a twenty-six question survey beginning with six demographic questions that captured information about the participants’ gender, race, age, neighborhood of residence, number of people in the household, and children under the age of 18 in the home. The next twenty questions inquired about the respondent’s frequency of shopping at farmers markets, when they learned they could use their EBT cards at farmers markets, where they purchased or grew their food, how quality and price of food at farmers markets compares to that of other establishments, how they prepare the food purchased from farmers markets, frequency eating healthy foods, and frequency eating other foods. Most questions are nominal, ordinal, or interval level of measurement and a few questions ask for a brief qualitative narrative based on their response from the previous question.
Data Analysis

The researchers in this study utilized statistical and content data analysis. Quantitative data was entered and coded using Statistical Package for the Social Sciences (SPSS) for Windows version 20.0. Statistical data was then generated using a combination of chi-square, t-test, and correlation testing, depending on the level of measurement of the variables being analyzed. Descriptive statistics were also generated. Relationships between variables were analyzed using correlation testing to measure the reliability of the survey and specific questions in the survey. Content analysis was conducted on the responses to the two narrative questions in the survey. To increase interrater reliability, each researcher individually analyzed the narrative responses by identifying themes that emerged in the responses. The number of responses that fit into each theme was then tabulated and computed to generate basic descriptive statistics.

Protection of Human Subjects

The Protocol for the Protection of Human Subjects application was submitted and approved by the Division of Social Work as exempt research with approval number 12-13-022 (see Appendix D). This application described the anticipated methodology of the study as well as any potential impacts on participants. Before completing the survey, all participants signed a consent form which included the purpose of the research; associated procedures, risks, and benefits; confidentiality; compensation; researcher contact information; and a statement of voluntary participation. The researchers also insured voluntary participation by waiting until all EBT transactions were completed before asking prospective participants if they would like to take part in the study.
Participant information and surveys were kept confidential, as survey data was aggregated and identifying information was replaced with pseudo-names in the thesis text. Names were not recorded on completed surveys and consent forms were collected and stored separately from completed surveys in order to prevent participant identities from being connected to survey responses. The surveys and consent forms were stored in a locked case to which only the researchers had access until collection and analysis of data for the purpose of this study were completed. Once the California State University, Sacramento, Office of Graduate Studies, accepts this Master of Social Work thesis project, the data will be destroyed by shredding.

Summary

This mixed method research project sought to explore any changes in food-buying and eating behaviors of CalFresh participants as a result of expanded EBT card access at farmers’ markets. The researchers compiled a convenience sample of 58 participants by distributing surveys at EBT card processing stations at five Sacramento-area farmer’s markets. The instrument consisted of a twenty-six-question survey that measured participants’ eating and food-buying habits with multiple choice, fill in the blank, and narrative questions. The participants were informed of procedures to ensure confidentiality, the improbability of any risk, and a two-dollar inducement. The researchers conducted statistical analysis of responses to quantitative and content analysis of responses to qualitative questions. Conclusions were framed from the analysis of the data, and these results and conclusions are discussed in the subsequent chapters.
Chapter 4

RESULTS

Descriptive and inferential statistics were used to analyze the study data. The researchers were interested in the relationship between EBT card usage at farmers’ markets and participants’ shopping and eating behaviors. Specifically, the researchers were interested in participants’ frequency shopping at farmers’ markets and participants’ frequency eating healthy foods, such as fruits and vegetables. The researchers had two hypotheses: H1: participants’ frequency shopping at farmers’ markets would increase due to the ability to use EBT at farmers’ markets; and H2: participants’ consumption of healthy produce would increase due to the ability to use EBT at farmers’ markets.

Descriptive Statistics

Table 1 illustrates the total of 58 participants and the farmers’ markets from which the sample was collected. Thirty-one surveys were collected from the Central farmers’ market, 24 were collected from the Florin farmers’ market, two from the Sunrise market, and one from the Laguna market.

Table 1

Number of participants by farmers’ market.

<table>
<thead>
<tr>
<th>Farmers’ Markets</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>31</td>
<td>53.4</td>
<td>53.4</td>
<td>53.4</td>
</tr>
<tr>
<td>Florin</td>
<td>24</td>
<td>41.4</td>
<td>41.4</td>
<td>94.8</td>
</tr>
<tr>
<td>Sunrise</td>
<td>2</td>
<td>3.4</td>
<td>3.4</td>
<td>98.3</td>
</tr>
<tr>
<td>Laguna</td>
<td>1</td>
<td>1.7</td>
<td>1.7</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
All participants reported their gender, which included 13 (22.4%) male participants and 45 (77.6%) female participants. Participants’ ages ranged from 20 years old to 69 years old (n=58, M=38.70, sd=14.05). Figure 1 illustrates the spread and count of participants’ ages with the line representing the mean of 38.70.

![Figure 1](image)

*Figure 1*

Number of participants by age.

The number of people who lived in participants’ homes ranged from one person to 11 people (n=58, M=3.55, sd=2.03), and the number of people under 18 years old who
lived in participants’ homes ranged from zero people to seven people (n=58, M=1.34, sd=1.55).

Table 2 describes the participants’ race and/or ethnicity. Participants who checked more than one response for race/ethnicity were coded as “Multi-racial.” The category of “Other” was created to be as inclusive as possible of all races and ethnicities. Some responses for “Other,” such as Hmong, were coded into another category that was reflective of the response, such as “Asian or Pacific Islander.” The 2 remaining “Other” responses were recorded as “Palestinian;” these responses were not recoded into another category as the researchers decided the other race/ethnicity categories were not reflective of these responses.

Table 2

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>African or African Descent</td>
<td>8</td>
<td>13.8</td>
<td>13.8</td>
<td>13.8</td>
</tr>
<tr>
<td>Asian or Pacific Islander</td>
<td>8</td>
<td>13.8</td>
<td>13.8</td>
<td>27.6</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>5</td>
<td>8.6</td>
<td>8.6</td>
<td>36.2</td>
</tr>
<tr>
<td>White</td>
<td>28</td>
<td>48.3</td>
<td>48.3</td>
<td>84.5</td>
</tr>
<tr>
<td>Native American or Alaskan Native</td>
<td>2</td>
<td>3.4</td>
<td>3.4</td>
<td>87.9</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>3.4</td>
<td>3.4</td>
<td>91.4</td>
</tr>
<tr>
<td>Multi-racial</td>
<td>5</td>
<td>8.6</td>
<td>8.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
Figure 2 depicts participants’ race/ethnicity by specific farmers’ market, and illustrates that more people of color versus white individuals shop at the Florin market over the Central market.
Table 3 shows the Sacramento neighborhoods in which participants’ reported they lived. The Downtown and Midtown neighborhoods accounted for 15 (25.9%) of the participants’ residences, and the South Sacramento neighborhood accounted for 20 (34.5%) of the participants’ residences, which is where the Central farmers’ market and the Florin farmers’ market are each respectively located.

Table 3

*Participants' neighborhood of residence.*

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oak Park</td>
<td>1</td>
<td>1.7</td>
<td>1.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Davis</td>
<td>1</td>
<td>1.7</td>
<td>1.8</td>
<td>3.6</td>
</tr>
<tr>
<td>Land Park</td>
<td>1</td>
<td>1.7</td>
<td>1.8</td>
<td>5.4</td>
</tr>
<tr>
<td>Tahoe Park</td>
<td>2</td>
<td>3.4</td>
<td>3.6</td>
<td>8.9</td>
</tr>
<tr>
<td>Midtown</td>
<td>7</td>
<td>12.1</td>
<td>12.5</td>
<td>21.4</td>
</tr>
<tr>
<td>Downtown</td>
<td>8</td>
<td>13.8</td>
<td>14.3</td>
<td>35.7</td>
</tr>
<tr>
<td>Natomas</td>
<td>4</td>
<td>6.9</td>
<td>7.1</td>
<td>42.9</td>
</tr>
<tr>
<td>West Sacramento</td>
<td>3</td>
<td>5.2</td>
<td>5.4</td>
<td>48.2</td>
</tr>
<tr>
<td>South Sacramento</td>
<td>20</td>
<td>34.5</td>
<td>35.7</td>
<td>83.9</td>
</tr>
<tr>
<td>Elk Grove</td>
<td>2</td>
<td>3.4</td>
<td>3.6</td>
<td>87.5</td>
</tr>
<tr>
<td>East Sacramento</td>
<td>1</td>
<td>1.7</td>
<td>1.8</td>
<td>89.3</td>
</tr>
<tr>
<td>Rancho Cordova</td>
<td>1</td>
<td>1.7</td>
<td>1.8</td>
<td>91.1</td>
</tr>
<tr>
<td>Carmichael</td>
<td>1</td>
<td>1.7</td>
<td>1.8</td>
<td>92.9</td>
</tr>
<tr>
<td>North Sacramento</td>
<td>1</td>
<td>1.7</td>
<td>1.8</td>
<td>94.6</td>
</tr>
<tr>
<td>Curtis Park</td>
<td>1</td>
<td>1.7</td>
<td>1.8</td>
<td>96.4</td>
</tr>
<tr>
<td>Homeless</td>
<td>2</td>
<td>3.4</td>
<td>3.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>56</td>
<td>96.6</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Missing System</td>
<td>2</td>
<td>3.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In Figure 3, the researchers recoded participants’ neighborhoods of residence into low-income and middle-class based on the researchers knowledge of those communities. Specifically, the low-income category consists of the communities of Oak Park, West Sacramento, South Sacramento, Rancho Cordova, North Sacramento, and homeless. The middle-class category consists of the communities of Davis, Land Park, Tahoe Park, Midtown, Downtown, Natomas, Elk Grove, East Sacramento, Carmichael, and Curtis Park. The table shows that participants equally represent neighborhoods commonly seen as low income and middle class.

*Figure 3*

Participants’ neighborhoods grouped by socioeconomic status.
Participants’ Food-Purchasing Behaviors

The section of the survey that measured food-purchasing behaviors consisted of a variety of different types of questions. A yes or no question was asked regarding if the time of survey completion was the first time the participant had used his or her EBT card at a farmers’ market. An open-ended question inquired into the number of months before the time of survey completion the participants had learned about EBT access at farmers’ markets. A before and after open-ended question series asked how many time per year participants’ frequented farmers’ markets before using EBT and after beginning to use EBT at farmers’ markets. A “hint box” was provided to help participants convert weekly frequency to yearly frequency. A series of checklist questions inquired into where participants shopped for food before using EBT and after beginning to use EBT at farmers’ markets. Potential responses included and were limited to “grocery stores,” “farmers’ markets,” “convenience stores/gas stations,” “wholesale stores,” “community or private gardens,” and “other.” Examples of each value were provided and participants could check as many values as applied. The last question in the food-purchasing behavior section was a checklist question seeking to provide insight into the reasons participants shopped at farmers’ markets. Potential responses included “prices,” “locations,” “customer service,” “EBT card access,” “quality of produce,” “variety of produce,” “sense of community,” and “other.”

When asked if participants’ first time using EBT at a farmers’ market was at the time of study participation, 31% (n=18) of participants said it was their first time and 69% (n=40) said it was not their first time.
When asked the number of months participants had known about EBT access at farmers’ markets, responses ranged from zero months to 29 months (n=57, M=8.18, sd=6.92). Six participants stated they learned of EBT access at farmers’ markets the day of survey completion, which accounts for the response of zero months.

When asked about participants’ frequency shopping at farmers’ markets per year before using EBT at farmers’ markets, responses ranged from zero times per year to 52 times per year (n=58, M=19.43, sd=17.46). When asked about participants’ frequency shopping at farmers’ markets per year after beginning EBT use at farmers’ markets, responses ranged from zero times per year to 52 times per year (n=58, M=25.03, sd=18.21). Six participants stated they began using EBT at farmers’ markets the day of survey completion, which accounts for the response of zero months. This corresponds with the six responses of zero months in regards to the number of months participants’ had known about EBT access at farmers’ markets.

Figure 4 illustrates the reasons participants shop at farmers’ markets. Participants indicated they shop at farmers’ markets due to the quality of the produce (n=52, 89.7%), the prices of the produce (n=41, 70.7%), the variety of produce (n=36, 62.1%), the EBT access (n=34, 58.6%), the sense of community (n=25, 43.1%), the location of the market (n=14, 24.1%), the customer service (n=11, 19%), and other (n=3, 5.2%).
Figure 4

Participants’ reasons for shopping at farmers’ markets

Figure 5 and Figure 6 illustrate the sources where participants reported getting their food before using EBT at farmers’ markets and after beginning to use EBT at farmers’ markets, respectively. The responses are divided between participants who reported being white versus those who reported a race or ethnicity other than white. As evidenced by the graphs, the number of participants reporting to shop at farmers’ markets increases from pre-EBT usage to post-EBT usage for both white and non-white participants.
Figure 5

Food sources before using EBT at farmers’ markets

Figure 6

Food sources after beginning EBT usage at farmers’ markets
Participants’ Food-Consumption Behaviors

The section of the survey that measured food-consumption behaviors consisted of a variety of different types of questions. A series of two questions asked participants the number of healthy meals prepared at home per week before and after beginning EBT usage at farmers’ markets. A multiple choice question asked if participants consumed less junk food, described at soda, candy, chips, etc., since beginning EBT usage at farmers’ markets. Possible responses included “yes,” “no,” “not sure,” and “have never eaten junk food.” A multiple choice question asked if participants consumed less fast food, described at McDonalds, Taco Bell, etc., since beginning EBT usage at farmers’ markets. Possible responses included “yes,” “no,” “not sure,” and “have never eaten fast food.” A multiple-choice question asked participants how much food purchased from the farmer’s market is typically used. Responses included “all of it,” “most of it,” “some of it,” and “none of it.” The final question in this section asked if participants ate healthier since learning about EBT access at farmers’ markets. Possible responses included “yes,” “no,” and “not sure.”

When asked about the number of healthy meals participants prepared at home per week before using EBT at farmers’ markets, responses ranged from zero times per week to 21 times per week (n=58, M=9.17, sd=6.70). When asked about the number of healthy meals participants prepared at home per week after beginning EBT use at farmers’ markets, responses ranged from zero times per week to 21 times per week (n=58, M=10.25, sd=6.37). The significance of the increase in means will be discussed later in this chapter.
When asked about the number of healthy meals participants prepared at home per week before using EBT at farmers’ markets, responses ranged from zero times per week to 21 times per week (n=58, M=9.17, sd=6.70). When asked about the number of healthy meals participants prepared at home per week after beginning EBT use at farmers’ markets, responses ranged from zero times per week to 21 times per week (n=58, M=10.25, sd=6.37). The significance of the increase in means will be discussed later in this chapter.

Thirty-four participants (58.6%) reported eating less junk food since using EBT at farmers’ markets while 20.7% of participants (n=12) responded they had never eaten junk food. Additionally, 12.1% of participants (n=7) reported not eating less junk food since using EBT at farmers’ markets and 6.9% of participants (n=4) reported not being sure. Thirty-five participants (60.3%) reported eating less fast food since using EBT at farmers’ markets while 22.4% of participants (n=13) responded they had never eaten fast food. Additionally, 12.1% of participants (n=7) reported not eating less fast food since using EBT at farmers’ markets and 3.4% (n=2) of participants reported not being sure.

When asked how much food they use from their purchases at the farmers’ market, 58.6% of participants (n=34) reported using all of the food, 27.6% of participants (n=16) reported using most of it, and 12.1% of participants described using some of it. No participants (0%) reported using none of it.

When asked if they eat healthier since using their EBT card at farmers’ markets, 77.6% (n=45) responded they do eat healthier, 13.8% (n=8) responded they do not eat healthier, and 8.6% (n=5) reported they are not sure if they eat healthier.
Qualitative Section

Two qualitative, or narrative questions, were included in this study. The researchers separately developed non-mutually exclusive themes and coded responses into these themes. The researchers then jointly agreed on which themes to combine based on similarities.

Participants who answered “yes” regarding eating healthier since learning about EBT access at farmers’ markets were asked to briefly describe how they began eating healthier than before beginning EBT use at farmers’ markets. Of the 44 participants who responded, 11.36% (n=5) of the responses were excluded due to not directly addressing the question. Twenty-two participants’ responses (50%) stated or related to eating more produce. One participant stated, “I have access to better produce that is usually cheaper than in the stores, so I buy and eat more fruits and vegetables.” In regards to quality, 34.09% (n=15) respondents reported purchasing and consuming higher quality produce. One respondent wrote, “I love farmers’ markets due to their fresh produce and variety of foods.” Seven responses (15.90%) indicated participants’ prepared more meals or used more produce in prepared meals. One respondent wrote, “I snack on fruit instead of chips or cookies.” Another comment read, “Fresh veggies for my family makes better meals.” Two respondents reported eating healthier due to juicing and consuming smoothies. Six participants (13.63%) reported purchasing and consuming a larger variety of produce. One response stated, “Being able to buy better foods and variety to cook at home and ease of EBT use.” Five participants (11.36%) reported cheaper, more affordable options due to EBT access at farmers’ markets as how they were able to eat healthier foods. One
comment was especially poignant in regards to affordability, “I eat more as I will not eat food that is not healthy and their acceptance of EBT provides myself and the local community an opportunity to buy food despite our low income.”

Participants were also asked how EBT card access can be improved at farmers’ markets. Major themes identified by the researchers included no changes to the current EBT process, each vendor should have an EBT processing machine, the EBT processing terminal should accept cash aid as well as CalFresh, the vouchers distributed to customers should be smaller, more vendors should accept the CalFresh vouchers, better incentives should be provided to vendors and participants, and participants should be shown how to use the food at farmers’ markets through cooking demonstrations and other nutritional education.

**Inferential Statistics**

A Paired Samples t-Test (see Table 4) was conducted to determine if there was a statistically significant difference between the means of participants’ frequency shopping at farmers’ markets before using EBT at farmers’ markets (n=58, M=19.45, sd=17.46) and participants’ frequency shopping at farmers markets after beginning to using EBT at farmers’ markets (n=58, M=25.03, sd=18.21). Results showed a mean difference of -5.60 (sd=11.67, t=-3.65, df=57, p<.001) indicating that participants shopped more frequently at farmers’ markets upon beginning EBT use at farmers’ markets. Further analysis of the data could establish a more direct causation between EBT card access at farmers’ markets and an increased frequency shopping at farmers’ markets.
Table 4

Paired samples t-test – Frequency shopping at farmers’ markets

<table>
<thead>
<tr>
<th>Paired Differences</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
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<tr>
<td>Mean</td>
<td>Std. Deviation</td>
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<td></td>
<td>-5.60345</td>
<td>11.67985</td>
<td>1.53364</td>
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Figure 7 illustrates the comparison and the aforementioned mean increase of participants’ frequencies shopping at farmers’ markets per year before and after beginning to use EBT at farmers’ markets. Shopping frequencies of less than 25 times per year decreased while shopping frequencies of more than 25 times per year increased.

Figure 7

Comparison of frequencies shopping at farmers’ markets before and after beginning EBT usage at farmers’ markets
A Paired Samples t-Test (see Table 5) was conducted to determine if there was a statistically significant difference between the means of the number of healthy meals participants’ prepared at home before using EBT at farmers’ markets (n=58, M=9.17, sd=6.70) and the number of healthy meals participants’ prepared at home after beginning to using EBT at farmers’ markets (n=58, M=10.25, sd=6.37). Results showed a mean difference of -1.08 (sd=2.30, t=-3.58, df=57, p<.001) indicating that participants cooked more healthy foods at home upon beginning EBT use at farmers’ markets. Further analysis of the data could establish a more direct causation between EBT card access at farmers’ markets and an increase in healthy, home-cooked meals and healthy eating behaviors.

Table 5

*Paired samples t-test – Number of meals prepared at home*

<table>
<thead>
<tr>
<th>Paired Differences</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
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<tr>
<td></td>
<td>Mean</td>
<td>Std. Deviation</td>
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<tr>
<td>-5.60345</td>
<td>11.67985</td>
<td>1.53364</td>
<td>-8.67451</td>
</tr>
</tbody>
</table>
Figure 8 illustrates the comparison and aforementioned mean increase of the number of healthy meals participants prepare at home per week before and after beginning to use EBT at farmers’ markets. The lower number of meals prepared at home decrease while most of the number of meals prepared at home more than 5 times per week increase.

Figure 8
Comparison of number of healthy meals prepared at home before and after beginning EBT usage at farmers’ markets

Summary
The researchers analyzed data using descriptive and inferential statistics. Demographic data was also collected and evaluated. Descriptive statistics and demographic data were used to provide basic insight into central tendencies, frequency distributions, and means of variables. The researchers primarily compared response frequencies between gender values, ethnic and racial values, and market values.
Examining the frequency distribution of individual variables also proved beneficial in gaining a basic conceptual understanding of the sample and general trends in responses.

The researchers used a two-tailed independent sample t-test to compare the means of participants’ frequency shopping at farmers’ markets per year before and after beginning EBT use at farmers’ markets. The results showed a statistically significant difference in the means of the before and after shopping frequencies, indicating participants did indeed shop more at farmers’ markets as a result of EBT access. Frequency analysis of questions related to participants’ shopping behaviors were consistent with this finding.

The two-tailed sample t-test was also applied to the number of meals participants prepared at home per week pre- and post- EBT usage at farmers’ markets. Again, the results showed a statistically significant difference in the means of the number of meals prepared at home, signifying participants prepared more meals at home as a result of EBT use at farmers’ markets. Frequency analysis of questions related to participants’ consumption behaviors were consistent with this finding. Further discussion will take place in the following chapter.
Chapter 5

DISCUSSION

This chapter will discuss significant findings of this study’s exploration of the eating and food-purchasing behaviors of CalFresh participants’ who use their EBT cards at four Sacramento-area farmers markets. Researchers were specifically interested in participants’ shopping frequency and participants’ consumption of healthy foods, such as fruits and vegetables. A brief discussion of the hypotheses will begin this chapter’s first section, followed by a discussion on the findings, which are organized by the sub-sections: Women verses Men, Ethnicity and Farmers’ Market Participation, Farmers’ Markets and Economic Class, and Participants’ Food-Consumption Behaviors. The implications of micro and macro social work practice are presented, followed by the study’s limitations and recommendations. Concluding thoughts end the current chapter of the presented study.

Hypothesis and Major Findings

The researchers hypothesized the intervention of EBT terminals at farmers’ markets will provide CalFresh participants with greater access to healthy foods, which will increase consumption and purchasing of fresh produce. The researchers reject the null hypothesis due to significant findings, which suggest EBT processing terminals at farmers’ markets are associated with increased CalFresh participant consumption and purchasing of fresh produce.
Women verses Men

Descriptive statistics concluded that of the 58 study participants 45 (77.6%) were female and 13 (22.4%) were male. This significant difference in gender participation highlights a common occurrence within food access studies, which have identified women as playing a key role in the eating and consumer behaviors’ of families. Research exploring the change in the United States of dietary habits from nutritious meals to processed and ready to eat foods points to women as the creators of these eating habits attributing the evolution of new roles for women in the 20th century as having affected the eating habits of people (Bowers, 2000). While the researchers of this study cannot deny that women’s roles have changed dramatically and changed aspects of some dietary lifestyles, research allegations which claim that women’s evolution of new roles in the 20th century are the primary cause of poor dietary health promote patriarchal practices that create a wider division between economic classes, creating yet a larger population of people in poverty and limiting the creation of effective food access interventions.

In the first chapter of this study, researchers acknowledged the social change in eating behaviors currently taking place and introduced research that indicated eating behaviors as only marginally responsible for health problems associated with nutrition when compared to the creation of unhealthy eating environments (Satia, 2009; Izumi et al., 2011). Chapter two described how lack of investment in low-income communities causes structural resources to flee economically challenged environments for environments that offer larger financial returns, leaving behind communities that lack stable employment, opportunities for mobility, investment in the community, and access
to resources such as supermarkets (Tickamyer and Duncan, 1990; Izumi et al., 2011).

Wig and Smith (2008) recognized women as instrumental in the shopping decisions and observed their consumer behaviors to explore their nutritional motivations and found that women were mainly influenced by economic and environmental situations rather than by personal choice. Among the most influential determinants of shopping behavior were transportation and store accessibility. The literature presented in chapter two does not designate a single factor as the culprit of unhealthy eating behaviors, but instead recognizes that unhealthy eating behaviors and food access issues are multi-faceted and, whether due to an absence of nutrition education, a lack of access to healthy foods, income restrictions, or high costs of healthy food options, poverty was found to be a common theme in literature regarding barriers to healthy food access and dietary behaviors (Gittelsohn et al., 2008; Song et al., 2009; Evans et al., 2012).

The findings in this study that identified women as primary procurers of food coincides with SNAP, CalFresh, and EBT literature, in that the identification of women as key figures in the creation of dietary habits makes them essential to the development of food access interventions that find new and innovative ways to provide more access to fruits and vegetables for low-income people (Wigg & Smith, 2008; Herman et al., 2008; Black et al., 2009).

**Ethnicity and Farmers’ Market Participation**

The study sample was almost evenly divided between ethnic minorities and white participants, with white participants representing 28 of the 58 participants and people of color representing 30 of the 58 participants. There appears to be no difference of EBT
participation at farmers’ markets between people of color and white beneficiaries when evaluating the data for overall ethnic/racial participation. However, data did reveal a significant difference between white and non-white participants who use EBT terminals at the Central farmer’s market versus the Florin farmers market. Researchers found that the participation of white participants was more than double the participation of non-white participants at the Central farmers’ market, which is located in a middle-income community. The Florin farmer’s market, located in a low-income community, had a participation rate of people of color that was almost double the participation of white participants. This difference in participation between people of color and white individuals at the farmers’ market located in a low-income neighborhood versus the farmers’ market located in a middle-income neighborhood indicates a difference in race/ethnicity, and perhaps a subtle difference in socioeconomic status.

Literature illustrated being of lower socioeconomic status is a risk factor for poor dietary habits and for low consumption of fruits and vegetables (Cassady, Jetter, & Culp, 2007; Song, Gittelsohn, Kim, Suratkar, Sharma, and Anliker, 2009). Recent SNAP research data has acknowledged that the face of SNAP participation has changed in light of current economic hardships, which has created a population of newly unemployed or underemployed people (USDA, 2012a). While EBT terminals at farmers’ markets are considered an intervention to lack of food access in low-income neighborhoods, these findings suggest that EBT terminals at farmers’ markets located in middle class neighborhoods, such as the Central farmers’ market in Downtown Sacramento, are also a means of access to healthy and affordable foods by a population recently restricted by
income, but not necessarily by lack of structural resources as is the case in underserved communities. Further research into the intersectionality of class and ethnicity is needed to corroborate any kind of significant relationship.

**Farmers’ Markets and Socioeconomic Status**

Recent studies have suggested that the majority of direct agricultural markets focus on exclusive products and exclusive customers (DeLind, 1993, as cited in McEntee, 2010). These studies claim that a number of farmers' markets in the United States have targeted or ended up serving largely educated, middle-class consumers, and described many direct markets as involving social relations where the balance of power and privilege ultimately rests with well-to-do consumers (McEntee, 2010). This study challenges findings that claim that farmers’ markets cater only to higher social economic classes as this study’s sample was exclusively obtained from CalFresh participants who use EBT access at farmers’ markets. Because EBT access is a part of a federal and state funded supplemental food program that serves a wide range of low-income persons, this data gathered at the four Sacramento farmers’ markets contradicts claims in research that farmers’ markets only serve people of financial means and higher social economic strata.

The provision of EBT access is an effort of Sacramento area farmers’ markets of being an equitable provider of foods and produce to all people from all socioeconomic statuses. From this data, the researchers infer that farmers’ markets in low-income communities are making it possible for low-income residents to access fresh produce through the intervention of EBT access and the high frequency of EBT usage in middle income neighborhoods provides a method for people experiencing financial hardships to
continue healthy dietary behaviors.

**Participants’ Food-Purchasing Behaviors**

Preliminary data analysis indicated wireless EBT processing terminals at farmers’ markets positively influence participants’ food-purchasing behaviors. Frequency statistics regarding the frequency participants’ shopped at farmers’ markets per year before and after beginning EBT usage at farmers’ markets illustrate that shopping frequencies of 25 times per year or less decreased, while the shopping frequencies of more than 25 times per week increased. Also, a two-tailed sample t-test revealed a statistically significant mean increase in the frequency participants’ shopped at farmers’ markets per year before and after beginning EBT usage at farmers’ markets. These results indicate participants are indeed shopping at farmers’ markets more frequently since beginning to use EBT at farmers’ markets.

Results also showed that the majority of participants (69 percent) have used EBT at the farmers’ market at least one time prior to survey completion, and the remaining 31 percent were using EBT for the first time at the farmers’ market, indicated that the program is attracting new CalFresh participants while retaining established CalFresh users. The number of participants who stated they obtained food from farmers’ markets increased from before EBT usage to after EBT usage at farmers’ markets, indicating that more participants consider farmers’ markets a viable place to shop for food. These results combined with the mean increase of shopping frequency denotes a relationship between offering EBT access at farmers’ markets and an increase in shopping frequency at farmers’ markets.
Participants’ Food-Consumption Behaviors

Preliminary data analysis indicated wireless EBT processing terminals at farmers’ markets positively influence participants’ food-consumption behaviors. Frequency statistics regarding the number of healthy meals prepared at home per week before and after beginning EBT usage at farmers’ markets illustrate that meals prepared at home five times per week or less decreased, while the meals prepared at home more than 5 times per week increased. Also, a two-tailed sample t-test revealed a statistically significant mean increase in the number of meals prepared at home per week before and after EBT use began. These results indicate participants are indeed preparing more meals at home since beginning to use EBT at farmers’ markets.

This data corresponds with the literature presented in chapter two that indicated neighborhoods with multiple opportunities to buy dark-green and orange vegetables to individuals higher consumption in daily servings of these foods when compared with individuals living in areas with no neighborhood store selling five or more varieties of dark-green and orange vegetables (Izumi et al., 2011). Herman et al. (2008) reported participants’ intake of fruits and vegetables increased with the distribution of produce vouchers to WIC participants, with fruit and vegetable consumption increasing at a higher rate among those participants who shopped at farmers’ markets than supermarket participants. The results from this study and from the presented literature support interventions that offer greater access to healthy and affordable produce, and specifically supplemental food programs, such as CalFresh at farmers’ markets, which have proven to
be effective methods for increasing produce purchases and consumption among underserved communities.

Participants’ responses to the question regarding the amount of food actually used from the farmers’ market indicate participants’ are using the majority of food purchased from farmers’ markets. The number of participants who reported eating less “junk food” and less “fast food” since using EBT at farmers’ markets is greater than the number of participants who reported not eating less “junk food” or “fast food,” indicating a possible relationship between EBT usage at farmers’ markets and eating less junk food and fast food. Most participants also reported eating healthier since using EBT at farmers’ markets, and of those, a majority reported eating more fruits and vegetable, cooking more meals at home, and using more farmers’ market produce in meals. Although these results, based on frequency statistics, do not show a statistically significant relationship with EBT usage at farmers’ market, when paired with the statistically significant increase in means of the number of meals prepared at home, results appear to indicate a relationship between EBT usage at farmers’ markets and positive changes in consumers’ food-consumption behaviors.

**Implications for Micro Social Work Practice**

As social workers fulfill their professional commitment to serve vulnerable populations and provide competent services that meet the needs of those they serve, a parallel nutritional need is growing within the communities they serve. Inadequate food access within low-income communities has contributed to the rise in obesity, diabetes, and cardiovascular disease (Story et al., 2008). Low-income populations, initially
bypassed by the movement of healthier, nutritious, organic, and local foods, have become the target of chronic, preventable diseases. Social workers in direct practice who are addressing the nutritional needs and food access of underserved populations may use the knowledge derived from this study to inform the evidence-based practice of social work in community organizing efforts. The Solidarity Economy framework can be referred to by social workers deconstructing the social environments of clients to better understand the multi-level factors that create issues in low-income environments. As introduced in chapter one, this approach offers a practical means by which to practice social work's unique values of social justice, dignity, and worth of people in view of the framework’s promotion of economic and social development through the use of non-oppressive, non-hierarchical methods.

The focus of the study on CalFresh participants, who use EBT at farmers’ markets, can help demystify the nutrition assistance programs for social workers who may need a more intimate understanding of the experiences of participants and the barriers they encounter. Because many social work functions require a collaborative effort among multi-disciplinary teams, these findings may be incorporated to support the nutritional needs of clients when working with dietetic practitioners, physicians, and nutrition educators, all of who can play an important role in increasing the availability and consumption of nutritious foods to clients facing dietary health disparities (Izumi et al., 2011).

Furthermore, the results of this study will be provided to the local non-profit corporation that operates the wireless EBT terminals at the Sacramento area farmers’
markets, as supportive statistical research in their efforts to attain funding through grants and donors for the EBT at farmers’ markets program. Grants, contracts, and donations are an indispensable part of non-profit community-based organizations and events. Because nutrition education and the implementation of food access interventions in low-income communities are vital to the alleviation of numerous barriers and social ills, the researchers encourage the use of this study to inform and support the creation of socially just food environments.

**Implications for Macro Social Work Practice**

Social workers in macro level practice, with ability to advocate and advance research through funding, resources, and public policy, can use the empirical data of this study and other studies presented in the literature review to advocate on behalf of food access interventions in underserved communities. As suggested in the literature review little research is available to evaluate the efficacy or impact of government programs, and the resources they help build in low-income communities, through the interventions with food pantries, food banks, and other emergency food programs that procure and store fresh fruits and vegetables.

In 2010, 14.5 percent of all American households were food insecure, including 5.4 percent who experienced very low food security; SNAP participation reached 45 million in the fiscal year 2011(USDA, 2012a). Food insecurity is a national issue and the data from the USDA of millions experiencing food access issues should be of high concern to policy makers at the local, state, and federal level. The Supplemental Nutrition and Assistance Program is an important government program planned by policy
makers to address the needs of a population with nutritional needs. Policy makers have
the responsibility of making effective changes to this program and others like it by
informing themselves with research like this study to be able to make knowledgeable
adjustments based on program participant perceptions of food access barriers and
interventions. This study and its results can be used by policy makers to assign
appropriate and practical methods of interventions as well as the allocation of food
allotment based on the real cost of healthy food.

In addition this study’s presentation of the larger background problem of poverty
and low-income communities disinvestment calls upon social workers to advocate for
preventative solutions rather then reactive interventions. Policy and planning responses
are needed to address the socioeconomic inequalities in the availability of affordable, and
accessible, healthier foods (Beaulac, Kristjansson, & Cummins, 2009). Because the issue
of poverty was found to be a common theme among the presented studies of food access
and dietary health disparities, policy maker’s ambiguity about a significant relationship
between the two suggests a reluctance to act against the factors that create poverty.

**Recommendations**

This preliminary study of the eating and shopping behaviors of CalFresh
participants who use their EBT card at farmers’ markets provides insight into the success
of EBT terminals in farmers’ markets as a food access intervention. The measurable
effects of the consumption of fresh produce and increase of healthy meals among
participants suggest a need for EBT terminals in all farmers’ markets, especially farmers’
markets in communities with limited or no structural food sources. The researchers of
this study recommend further research and public policy development regarding food access interventions, to explore the success of these in providing better access of healthy foods in low-income communities. The researchers encourage the proper assessment of communities and community residents in order to understand the nutritional needs of individual communities for the purpose of implementing interventions that effectively meet their needs.

Similar to the recommendations of the research in chapter two, the researchers of this study recommend partnerships between states, municipalities, community members, and public and private coalitions, councils, and organizations to further harness resources and ideas to support and promote community farmers’ markets (Cassady et al., 2007; Community Food Security Coalition and Partners, 2007; Briggs et al., 2010). Farmers’ markets are a means of food access that stimulate local economies by providing local farmers and vendors the freedom of selecting various locations from which to sell their goods without structural restrains. The researchers encourage support of farmers’ markets and small and mid-sized farms in planning and zoning regulations, reduction or waiving of fees when market coordinators apply for permits, and the development of permits specific to farmers’ markets. Other recommendations for farmers’ markets have advised in-kind or financial supports, such as EBT technical and infrastructure assistance, and facilitation of partnerships among farmers’ markets and community organizations, agencies, residents, councils, and other institutions (Briggs et al., 2010). Because the results of this study found a positive relationship between EBT terminals in farmers’ markets and participants healthy eating and shopping habits, the researchers recommend
that cities facilitate coverage, or directly cover, the costs of EBT terminal transactions and processing fees and equipment rental through private funders, Federal grants, or state grants and funding allocated towards farmers’ markets.

Because healthy food access is a multi-faceted issue, the researchers recommend a multidisciplinary approach with interventions at various levels. Policy makers, dietetic practitioners, nutrition educators, community developers, food access organizations, fresh food retailers, social workers, and those to whom services are directed can all play a role in creating environments that are food secure and equitable in order to improve the dietary health of underserved communities.

**Limitations**

This study’s sample size of 58 participants may impact the validity of the study in that the sample may have been too small to be representative of SNAP or CalFresh participants, including those who use these benefits at farmers’ markets. The convenience sampling method used to collect data of CalFresh participants who shopped at farmers’ markets between November 2012 and February 2013 may also inhibit generalizability of the results as the participants could have already had a propensity to shop at farmers’ markets, thus making the sample not representative of the population of EBT users who shop at farmers’ markets across the county.

The questionnaire used for the purpose of data collection could have included more insightful demographic questions that allowed participants the opportunity to disclose their marital status, income, and socioeconomic status to allow inferences about the relationship between these factors and eating and shopping behaviors to be made.
Furthermore, questions inquiring into the length of time participants had been enrolled in the SNAP and the number of times they had enrolled could have provided researchers the opportunity to further analyze possible relationships between program enrollment, socioeconomic status, ethnicity/race, number of children, and gender.

The phrasing of many questions in the survey could have been altered to increase simplicity for participants, further clarify terms, provide options that capture a larger percentage of participants’ responses, and allow for more and various statistical testing. When asking about the number of healthy foods participants’ prepare at home, “healthy foods” could have been more clearly defined. The questions asking about participants’ junk food and fast food consumption could have been structured as a before and after question to increase accuracy and capture the responses of all participants, such as those who rarely or never consumed fast food or junk food before using EBT at farmers’ markets. The portion of the survey that included questions about participants’ consumption and shopping behaviors could have been more extensive and included additional Likert scale questions to measure these behaviors.

Language barriers excluded participants who did not speak English well. Researchers offered to assist with the completion of the survey, however some participants limited in their ability to speak English still declined to participate. The researchers’ ability to translate the survey into several languages was limited by funding and time for translation services.

Future studies should consider utilizing a pre-test/post-test design to more accurately capture how participants’ behaviors were affected by before and after EBT use
or access at farmers’ markets. Further studies could measure participants’ frequency shopping at farmers’ markets by utilizing EBT card numbers for tracking transactions. Larger sample sizes randomly selected from multiple farmers’ markets across the country may enhance the representativeness of the sample. Further research could expand the scope of study to explore how SNAP acceptance at farmers’ markets affects the consumption and shopping behaviors of all SNAP participants. Much more research is needed to acquire an accurate glance into the effects of EBT access at farmers’ markets.

**Conclusion**

Literature about farmers’ markets has documented that an overwhelming amount of consumers frequent farmers’ markets because they are a good source of fresh, high quality produce (Lockeretz as cited in Beaulac, 2009; McEntee, 2010). The inclusion of EBT terminals at farmers’ markets not only provides a mobile, inexpensive structure selling fresh and healthy produce to low-income environments with limited supermarkets, it also allows for the participation of SNAP beneficiaries. Although there is a growing number of SNAP participants in middle-income communities due to the current economic downturn, food access issues are interlinked with lower socioeconomic urban communities. Promotion and funding of farmers’ markets with EBT access is one potential intervention to address access to healthy foods in underserved communities. Although this study focused on the eating and shopping behaviors of CalFresh participants who use their EBT cards at farmers markets, the researchers cannot disregard how both the farmers market and EBT terminals harmonize in a perfect melody of access. Further research for the development of community assessment tools necessary to
identify the nutritional needs of residents, as well as research and development of access interventions are needed. The creation of a just and equitable food environment is essential for the well being of all people because a healthy nation cannot exist without healthy communities.
APPENDIX A

Letter of Authorization

June 27, 2012

Dr. Teahsha Bankhead
Professor, California State University, Sacramento
6000 J Street, Mariposa Hall 4010
Sacramento, CA 95819

Dear Dr. Bankhead,

As the Executive Director of Alchemist Community Development Corporation (Alchemist CDC), I grant authorization for Daniel Wilson and Veronica Ceja to collect data and information at our program sites for their thesis project. It is my expectation that their data collection and analysis will continue and build upon the research methods and instruments previously established by Alchemist CDC and others working on food access issues; including utilizing and expanding upon surveys developed by the national food access organization, Wholesome Wave, that are currently being utilized by Alchemist CDC and partner organizations and farmers' markets across the country.

Data and information may be collected via written survey and written, spoken, or video-recorded narrative from customers purchasing items with their CalFresh/EBT benefits. Collection will occur at four farmers markets in the Sacramento region where Alchemist CDC processes CalFresh/EBT transactions. The data and information collected will be made available to Alchemist CDC for future use. I also grant authorization for Daniel and Veronica to access any and all data and information pertaining to their thesis project that Alchemist CDC has previously collected.

Sincerely,

[Signature]

Davida Douglas
Executive Director,
Alchemist Community Development Corporation
APPENDIX B

Survey

1. What is your gender?  □ Male  □ Female

2. What is your race/ethnicity?
   □ African or African Descent  □ White
   □ Asian or Pacific Islander  □ Native American or Alaskan Native
   □ Hispanic or Latino  □ Other: ________________________________

3. What is your age? ______ years old

4. What neighborhood do you live in? ________________________________

5. How many people live in your home? ______

6. How many children under the age of 18 live in your home? ______

7. Is this your first time using your EBT card at a farmers market?
   □ Yes  □ No  □ Not sure

8. How many months ago did you learn you could use your EBT card at farmers markets?
   ______ months ago

9. How often did you shop at farmers markets before using your EBT card at farmers markets?
   ______ times per year  □ This is my first time

10. How often do you currently shop at farmers markets?
    ______ times per year  □ This is my first time

11. Where did you get your food before using your EBT card at farmers markets? (Check all that apply)
    □ Grocery stores (Safeway, Raley’s, Food Source, etc.)
    □ Farmers markets
12. Where do you currently get your food? (check all that apply)
- Convenience stores/gas stations (7-Eleven, Circle K, AMPM, etc.)
- Wholesale stores (Costco, Sam’s Club, etc.)
- Community or Private Garden
- Other: ________________________________________________

13. Why do you shop at farmers markets? (check all that apply)
- Prices
- Quality of Produce
- Locations
- Variety of Produce
- Customer Service
- Sense of community
- EBT Card Access
- Other: ________________________________________________

14. How many healthy meals did you prepare at home before using your EBT card at farmers markets?

_______ per week

15. How many healthy meals do you currently prepare at home?

_______ per week

16. Do you eat less “junk food” (soda, candy, chips, etc.) since using your EBT card at farmers markets?
- Yes  □ No  □ Not sure  □ Have never eaten “junk food”

17. Do you eat less “fast food” (McDonalds, Taco Bell, etc.) since using your EBT card at farmers markets?
- Yes  □ No  □ Not sure  □ Have never eaten “fast food”

18. How much of the food you purchased from the farmers market do you typically use?
19. Do you eat healthier since learning you could use your EBT card at farmers markets?

☐ Yes  ☐ No  ☐ Not sure

If yes, briefly describe how you eat healthier now that you did before you began using your EBT card at farmers markets:

________________________________________________________________________

________________________________________________________________________

20. In your opinion how can EBT card access at farmers markets be improved?

________________________________________________________________________

________________________________________________________________________
APPENDIX C

Consent Form

Purpose of the Research
The undersigned enters into the following agreement with researchers, Veronica Ceja and Daniel Wilson, Master of Social Work Students at the California State University, Sacramento. I have been informed and understand that the purpose of the survey is to explore the effectiveness of wireless Electronic Benefit Transfer (EBT) terminals at farmers markets in expanding CalFresh participants’ access to fresh, healthy produce.

Research Procedures
I understand that I will be asked to complete a survey, which includes questions about my frequency shopping at farmers markets, when I learned I could use my EBT cards at farmers markets, where I purchase or grow my food, how quality and price of food at farmers markets compares to that of other establishments, how I prepare the food purchased from farmers markets, frequency eating healthy foods, and frequency eating other foods. Most questions are nominal, ordinal, or interval level of measurement, but a few questions ask for a brief qualitative narrative based on my response from the previous question.

Risks
The survey used for this study is considered exempt due to the anonymous nature of the questions on personal consumer preferences relating to EBT usage and is not associated with any known mental or physical health risks.

Benefits
You will personally benefit from receiving $2 for completing and submitting the survey. Your participation may also provide additional insight into EBT usage at farmers markets for future funding and research purposes.

Confidentiality
I grant the researchers mentioned above, the consent to use my completed survey for the purpose of their study. The researchers shall have complete ownership of my completed survey and consent form. I understand and accept the researchers methods for ensuring the security of the data which, will be stored in a locked case that only the researchers have access to until collection and analysis of data for the purpose of this study is complete. I understand that once the data for the purpose of this study is accepted by
Sacramento State University Office of Graduate Studies all participant information and surveys will be shredded.

Compensation
You will receive $2 for completing and submitting the survey.

Contact Information
If you have any questions about this research, you may contact Teiahsha Bankhead, Ph.D., LCSW at (916) 278-7177 or by e-mail at bankhead@csus.edu. You may also contact the researchers Veronica Ceja at vc547@saclink.csus.edu or Daniel Wilson at dw422@saclink.csus.edu.

Your participation in this research is entirely voluntary. You are free to decide not to participate or to decide at a later time to stop participating. The researchers may also end your participation at any time. By signing below, you are saying that you understand the risks involved in this research and agree to participate in it.

Signature: _______________________________           Date:  ____________________
APPENDIX D

Protocol for the Protection of Human Subjects Approval Letter

CALIFORNIA STATE UNIVERSITY, SACRAMENTO
DIVISION OF SOCIAL WORK

To: Veronica Ceja & Daniel Wilson  Date: 10/24/2012
FROM: Committee for the Protection of Human Subjects
RE: YOUR RECENT HUMAN SUBJECTS APPLICATION

We are writing on behalf of the Committee for the Protection of Human Subjects from the Division of Social Work. Your proposed study, “Eating & Food Buying Habits of EBT Card Participants Who Shop at Farmers Markets.”

__X__ approved as __ X__EXEMPT  ____ NO RISK  ____ MINIMAL RISK.

Your human subjects approval number is: 12-13-022. Please use this number in all official correspondence and written materials relative to your study. Your approval expires one year from this date. Approval carries with it that you will inform the Committee promptly should an adverse reaction occur, and that you will make no modification in the protocol without prior approval of the Committee.

The committee wishes you the best in your research.

Professors: Maria Dinis, Jude Antonyappan, Teiahsha Bankhead, Serge Lee, Kisun Nam, Maura O’Keefe, Dale Russell, Francis Yuen

Cc: Bankhead
REFERENCES


