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The present study planned and implemented a new farmers' market, the Catawba County Public Health Farmers' Market (CCPH FM) at the local WIC office in Catawba County, North Carolina, of which Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Farmers' Market Nutrition Program (FMNP) participants were the main target audience. The purpose of this farmers' market was to provide convenience and improve access to locally grown fresh fruits and vegetables (F & V) in the community and to increase the FMNP coupon redemption rate. The main objectives of this study were to describe the overall process and key strategies involved in implementing a farmers' market at a WIC office, to examine motivators and enablers for visiting farmers' market located at the WIC clinic, and to assess improvement in redemption rate of FMNP coupons among WIC participants by expanding farmers' market access. A community-based participatory research design using different formative methods documented the process and key inputs in farmers' market implementation. Local farmers, program administrators, and community advocates were involved in documenting the implementation process. Multiple measurement methods included direct observation and semi structured interviews with staff and farmers ($n = 13$). The primary outcome measure was FMNP coupon redemption rate. Rates from 2007-2013 were averaged and compared using a weighted ranking system (% redemption * % eligible individuals). Furthermore, a customer survey was developed and carried out

in partnership with CCPH. Surveys ($n = 415$) were collected using a convenience sampling technique. Descriptive frequencies were conducted to describe the socio-demographic profile and to understand farmers' market purchasing behaviors among the study population. A community partnership among WIC, Eat Smart Move More, local farmers, UNCG, and CCPH was key in implementing the onsite farmers' market. The market occurred weekly for 24 weeks. A total of twelve WIC-approved farmers sold at the market and offered a variety of local produce. The 2013 redemption rate increased from 51.3% to 62.9%. Overall, the primary enablers and motivators identified among visitors to the farmers' market included variety of the fresh F & V, quality of fresh F & V, and the ability to purchase food grown locally. WIC FMNP participants were further motivated by low prices and the ability to easily spend FMNP coupons. This study highlights the importance of leveraging resources at the community level to address barriers to FMNP redemption. Locating farmers' markets at WIC clinics, in particular, can reduce barriers for FMNP participants and increase redemption.

A COMMUNITY-BASED PARTICIPATORY RESEARCH APPROACH
TO IMPLEMENTING A FARMERS' MARKET TARGETING
WIC FARMERS' MARKET NUTRITION
PROGRAM PARTICIPANTS

by

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CHAPTER I

INTRODUCTION

Health organizations worldwide recommend the consumption of fruits and vegetables (F & V) due to their high nutrient density and well-documented health promoting qualities (CDC “Strategies to Prevent Obesity and Other Chronic Diseases,” 2011; World Health Organization, 2003). Consumption of F & V reduces the risk of chronic diseases, including some cancers, heart disease, stroke, and type 2 diabetes (Hung et al., 2004; Serdula et al., 1996). However, nearly all Americans fail to meet the recommended guidelines for F & V consumption (Blanck et al., 2008). Consequently, the United States (U.S.) government has made an increasing effort to promote F & V consumption through different initiatives and programs, including the *MyPlate* (formerly *MyPyramid*) food guidance system supported by the U.S. Department of Agriculture’s (USDA) Center for Nutrition Policy and Promotion (“ChooseMyPlate.gov,” 2013) and First Lady Michelle Obama’s *Let’s Move* campaign (“Let’s Move!,” 2013). Given that the incidence of obesity and its related comorbidities are on the rise, increasing F & V consumption has emerged as a top strategy to protect the nation’s health.

Yet, access to F & V is disproportionately distributed and those of lower socio-economic status (SES) are at the greatest risk for under-consumption of F & V (Dubowitz et al., 2008; Lin, 2004). This problem is particularly salient because, according to the

U.S. Census, more than 46 million (15%) Americans live below the poverty line (U.S. Census Bureau, 2012) and 1 in 7 Americans is food insecure (USDA ERS, 2014). Since low SES is a significant predictor for under-consumption of F & V and chronic diseases, creating greater access to affordable, quality F & V has been considered one of the key tactics in reducing health disparities.

In 2011, the Centers for Disease Control and Prevention (CDC) identified ten strategies to increase F & V consumption, including to “start or expand farmers’ markets in all settings.” (CDC “Strategies to Prevent Obesity and Other Chronic Diseases-The CDC Guide to Strategies to Increase the Consumption of Fruits and Vegetables,” 2011). In fact, the number of farmers’ markets is on the rise (Brown, 2001; USDA, 2014) and the USDA reported a 3.6% increase in farmers’ markets from 2012 to 2013 alone (USDA, 2014). Moreover, the CDC has also called for an increase in the number of farmers’ market that accept Supplemental Nutrition Assistance Program (SNAP) and Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Farmers’ Market Nutrition Program (FMNP) benefits (Goodman, 2009). These programs have been successful at improving economic access to fresh F & V at farmers’ markets. WIC FMNP was created in 1992 to encourage WIC participants to shop more frequently at farmers’ markets with the primary goal of increasing F & V consumption. (Catalog of Federal Domestic Assistance: WIC FMNP,” n.d., WIC FMNP: United States Congress. House Committee on Agriculture, 1992). The program has also been successful at stimulating business for local farmers and creating greater awareness of farmers’ markets in local communities. Research with WIC FMNP has documented multiple benefits,

including improved access to and increased consumption of fresh F & V among FMNP participants, as well as boosted revenue for local farmers (Anliker, Winne, & Drake, 1992; Conrey et al., 2003; Grace et al., 2007; Racine, Smith Vaughn, & Laditka, 2010). Despite these important outcomes, redemption rates of FMNP coupons remain low across the U.S. (Conrey et al., 2003; National Association of Farmers' Market Nutrition Programs, 2001), and it is further noted that WIC participants face multiple barriers, such as lack of transportation and limited operation hours of local farmers' markets, which prevent them from redeeming FMNP coupons (Joy et al., 2001; Caines, 2004). Improving physical access to farmers' markets has been identified as one strategy to promote coupon redemption, and thereby, F & V consumption among the WIC population (Caines & Harvest, 2004; Concannon, Martin, & Erauth, 2011; Conrey et al., 2003).

There are currently very few studies describing the process of setting-up new farmers' markets, and only one of those studies specifically targeted WIC participants (Concannon, Martin, & Erauth, 2011; Evans et al., 2012; Freedman et al., 2013; Freedman et al., 2011). The present study examined the process and short-term outcomes of implementing an on-site WIC clinic farmers' market. A new farmers' market, the Catawba County Public Health Farmers' Market (CCPH FM), was planned and located at the WIC office in Catawba County, North Carolina. The purpose of this farmers' market was to provide convenience and improve access to locally grown fresh F & V in the community and specifically among WIC participants to increase the FMNP coupon redemption rate. To examine the outcomes of the establishment of this market and

impact on utilization of FMNP coupons for purchasing fresh F & V, this study was designed to investigate the following goals.

Primary Research Goals

Goal 1: To describe the overall process and key strategies involved in implementing and promoting a farmers' market located at a WIC office specifically targeting its participants.

Research questions: What are the key steps and inputs involved in planning, implementing, and promoting a farmers' market at a local WIC office? What are the main factors and recommendations for improvement that will lead to a market that can operate in future seasons?

Approach: A community-based participatory research approach using different formative methods documented the process and key inputs involved in farmers' market implementation. A process evaluation was used to evaluate the different components of planning and implementation. Semi-structured qualitative interviews ($n = 13$) were carried out with key stakeholders i.e., eight staff from CCPH and five local farmers who sold at the market. Other methods included direct observation and review of documents. The whole process of market planning, implementation, and organization was measured using a logic model (Appendix A) and was shared with other stakeholders.

Goal 2: To examine the effectiveness of locating and improving access to the farmers' market at the WIC office in the use of WIC FMNP coupons in Catawba County, North Carolina.

Research Question: Did locating a farmers' market at the WIC clinic increase the FMNP coupon redemption rate by improving access and convenience among WIC participants?

Hypotheses: The hypotheses were that the FMNP redemption rate in Catawba County would be significantly higher in 2013 than in previous seasons (2007 -2012), and that the redemption rate for 2013 in Catawba County would be significantly higher than the redemption rate in the control county of Cabarrus since the latter did not have an on-site farmers' market.

Approach: A case study design was used to examine county-level redemption rates from 2007-2013. Redemption rates in Catawba County from 2007-2013 were first examined using the pre-post comparison method. The case control method was used to compare Catawba County to a closely matched control county. Lastly, a weighted ranking system was developed in order to compare Catawba County's past and current redemption ranking to other counties in the state.

Secondary Research Goals

Goal 3: To examine the socio-demographic characteristics and F & V purchasing behaviors of the visitors attending the farmers' market located at the WIC clinic.

Research question: Are there differences in terms of age, ethnicity, and purchasing behaviors between WIC and non-WIC visitors attending the farmers' market?

Goal 4: To examine motivators and enablers for visiting farmer's market located at the WIC clinic.

Research questions: Did the farmers' market located at the WIC clinic improve access and convenience for WIC participants, thereby making it easier for them to spend their FMNP coupons? What are the primary factors that draw visitors to the farmers' market and how did they hear about the market? Do motivators and enablers differ between WIC visitors and non-WIC visitors attending the farmers' market?

Goal 5: To examine the F & V purchasing behaviors in terms of the total amount spent and variety of F & V purchased by WIC participants attending the farmer's market located at the WIC clinic.

Research Questions: Did the farmers' market located at the WIC clinic make it easier for WIC FMNP participants to spend their coupons? What types of fresh F & V will WIC FMNP participants purchase? Did WIC FMNP participants spend cash in addition to their coupons? Did WIC FMNP participants visit the farmers' market more than one time during the season? Where will WIC FMNP participants spend their coupons, the CCPH FM or other markets in the county?

Hypotheses for Secondary Goals: The hypotheses were that WIC FMNP participants who shop at the new WIC clinic farmers' market would: 1) purchase a variety of fresh F & V, 2) shop at the market more than one time during the season, 3) spend their coupons at the CCPH FM versus other markets in the county, and 4) indicate that the new market location made it easier for them to spend their FMNP coupons.

Approach for Secondary Goals: In order to meet the study objectives, individual surveys ($n = 415$) were carried out with the farmers' market visitors using a convenience sampling technique. The survey was designed and implemented in

partnership with CCPH. Key sections of the survey were: 1) socio-demographic information such as age, ethnicity, and zip code; 2) what drew visitors to the market (i.e. advertisements, quality and variety of produce, convenience, and support of local farmers); 3) shopping behaviors including payment method, amount of money spent, and variety of produce purchased; and 4) perceived benefits of the CCPH FM and suggestions for improvement. In addition, at the end of the survey, a section was included specifically for WIC FMNP participants. Under this section, questions were asked to collect information on the convenience of the farmers' market location, use of FMNP coupons, and ways in which the market may have helped them spend their FMNP coupons.

CHAPTER II

REVIEW OF THE LITERATURE

Fruits and Vegetables

Fruits and vegetables (F & V) are an essential component of a healthy diet due to their high nutrient density and abundant health promoting qualities. Inadequate consumption of F & V is a significant risk factor for chronic diseases, including obesity, heart disease, stroke, type 2 diabetes, and cancer (Blanck, et al., 2008; Hung et al., 2004; Serdula et al., 1996). Accordingly, in order for F & V to be effective in promoting health, it is important that individuals meet the serving recommendations. Optimal intakes are five to thirteen servings of F & V a day (2½ to 6½ cups), depending on individual caloric needs. For a person who consumes 2,000 calories a day, this translates into nine servings, or 4½ cups of F & V per day (Dietary Guidelines Advisory Committee, 2010). The current United States (U.S.) dietary guidelines recommend a minimum of “5 a Day,” at least two servings of fruit and three servings of vegetables (“Fruits & Veggies More Matters,” 2013). Furthermore, the U.S. government has made substantial effort to promote F & V consumption through different initiatives and programs, including the *MyPlate* (formerly *MyPyramid*) food guidance system supported by the United States Department of Agriculture’s (USDA) Center for Nutrition Policy and Promotion (“ChooseMyPlate.gov,” 2013), First Lady Michelle Obama’s *Let’s Move* campaign (“Let’s Move!,” 2013), and the USDA *Fruits*

& Veggies More Matters program (“Fruits & Veggies More Matters,” 2013). *MyPlate*, for example, suggests filling half your plate with F & V, and has adopted simple public health messages including “vary your veggies” and “focus on fruit” (“ChooseMyPlate.gov,” 2013). Despite a national public health focus on increasing F & V consumption, F & V intake remains suboptimal across all groups in the U.S. while rates of chronic diseases, such as heart disease and obesity, are on the rise.

Trends in F & V Intake

Studies have reported that nearly all Americans age two and older fail to meet the recommended dietary guidelines for F & V consumption (Blanck et al., 2008; Dubowitz et al., 2008; Krebs-Smith, et al., 2010). Currently, less than 10% of Americans meet the *MyPlate* recommendations of filling half of the plate with F & V (CDC, 2013), and an analysis of *MyPyramid* recommendations found that fewer than 1 in 10 Americans ate enough F & V (Kimmons, et al., 2009). According to the 2013 State Indicator Report for F & V, 40.8% of adults in North Carolina reported eating fruit less than one time per day, and 21.9% reported eating less than one vegetable per day (CDC “State-Indicator-Report-Fruits-Vegetables,” 2013). In estimating risk factors for F & V intake, it has been found that socioeconomic status (SES) is a significant determinant across all age groups (Campbell et al., 1999; Dubowitz et al., 2008; Lin, 2004). An analysis of diet quality among the U.S. adults found that low-income adults, in particular, were under-consuming fresh F & V (Lin, 2004). Various studies have further highlighted the disparity in consumption of fresh F & V between low and high-income groups, citing that low-income populations are eating fewer servings than their middle and higher income

counterparts (Anderson et al., 2001; Dubowitz et al., 2008; Rose & Richards, 2004). Since low SES is a significant predictor for under-consumption of F & V and chronic diseases, creating greater access to affordable, quality F & V has been considered as one of the key strategies in reducing health disparities.

Barriers to F & V Among Low-Income Groups

According to the U.S. Census, more than 46 million (15%) Americans live below the poverty line (U.S Census Bureau, 2012). One in seven Americans is food insecure, meaning they have anxiety about running out of money to buy food and may skip meals and/or experience hunger (USDA ERS, 2013). These Americans face the greatest difficulty obtaining the full range of a healthy diet, especially F & V.

Numerous factors impact the ability of lower SES households to procure F & V including: the high cost of fresh F & V, lack of time for preparation and cooking, inadequate knowledge and cooking skills, personal perceptions and attitudes, and insufficient access and availability of fresh produce (Colasanti, Conner, & Smalley, 2010; Grace, Grace, Becker, & Lyden, 2007; Haynes-Maslow, Parsons, Wheeler, & Leone, 2013; Schneider, McDonnell, & Neyman Morris, 2012; Tessman & Fisher, 2009). One qualitative study in North Carolina examined barriers to F & V intake among 68 low-income women and identified six major community-level barriers impacting access to F & V: high cost, no or poor public transportation, poor quality, limited variety, changing food environment (i.e., more fast food), and changing societal norms (i.e., more emphasis on convenience instead of cooking). The most commonly cited barrier was high cost, followed by lack of transportation (Haynes-Maslow et al.,

2013), which is consistent with previous findings. Limited access and availability along with the high price of fresh F & V are the two primary factors identified in the literature which contribute to low F & V consumption among low-income groups (Herman, Harrison, Afifi, & Jenks, 2008; Larsen & Gilliland, 2009; Tessman & Fisher, 2009).

Limited Access to Fresh F & V

The local food environment is a determinant of food access (Morland & Evenson, 2009). For example, some studies describe a relationship between the existence of food deserts and increased prevalence of obesity and nutrition-related diseases in the U.S., including in North Carolina (Morland, Diez Roux, & Wing, 2006; Morland & Evenson, 2009). Food deserts are defined as “urban neighborhoods and rural towns without ready access to fresh, healthy, and affordable food” (USDA, 2013). Food deserts have an abundance of convenience/corner stores and fast food restaurants that offer few healthy food options. There is limited or no access to supermarkets, grocery stores, and farmers’ markets. Thus, living in a food desert is associated with low levels of F & V consumption (Rose & Richards, 2004). For example, Laraia et al. (2004) found that pregnant women who lived more than four miles from a supermarket were significantly more likely to have poor diet quality, even after controlling for individual SES and the availability of smaller grocery and convenience stores (Laraia et al., 2004). Individuals in both urban and rural food deserts have better access to convenient, and energy-dense foods like fast foods over the affordable nutrient dense foods like F & V. Improving access to fresh F & V may increase intake, and a number

of studies have implemented strategies to foster physical and economic access to healthy foods, including efforts to locate supermarkets in food deserts, promote healthy corner stores, offer incentives to purchase healthy foods, develop mobile farm stands (also known as “veggie vans”) and community supported agriculture programs, and expand farmers’ markets by increasing operating hours and locations (Freedman, Bell, & Collins, 2011; Holben, 2010; Morton & Blanchard, 2007). Results of a farmers’ market initiative indicate that the addition of new farmers’ market locations helped in improving access to F & V and increasing intake (Freedman et al., 2013).

The High Price of Fresh F & V

While limited access to fresh F & V is well documented in the literature, it is of no surprise that F & V must be economically accessible to low-income groups for consumption rates to increase. Research shows that the high cost of fresh F & V is a major barrier for low-income populations (Colasanti et al., 2010; Leone et al., 2012). The current structure of food prices in the United States is that high sugar and high-fat foods provide calories at the lowest cost while foods with high nutrient density are among the most expensive (Andrieu, Darmon, & Drewnowski, 2005). People with a limited food budget will select lower-quality diets, consisting of high-energy, inexpensive food such as fast food since fresh F & V are more expensive on a per calorie basis than fats and sugars. However, consumers are responsive when prices of F & V decrease. For example, one study revealed that a 50% reduction in price resulted in a four-fold increase in fruit sales and a two-fold increase in vegetable sales (French, 2003). Other studies

have cited the influence of an economic incentive, such as matching funds called “bonus bucks,” in influencing shopping habits and increasing F & V intake (Young et al., 2011). Thus, reducing the price of F & V may increase intake.

Perceptions about the high cost of fresh F & V also influence the amount of produce low-income households purchase and consume. Henry et al (2003) found that F & V were perceived as expensive and thus could only be purchased in reduced quantities. Interviewees felt as if they had to give up other food to buy F & V and had to limit their purchases of F & V to items that were on sale (Henry et al., 2003). In a qualitative study conducted in eastern North Carolina that examined African-Americans’ perceptions of healthful foods, the belief that “healthy foods are too expensive” was the most prevalent of all explored barriers (Campbell et al., 1999). The finding that cost is an important influence on food consumption for those with lower incomes (Glanz, Basil, Maibach, Goldberg, & Snyder, 1998) suggests that programs aimed at increasing F & V consumption among low-income Americans should address both the actual and perceived price of fresh F & V. A study aimed at increasing F & V consumption among the WIC population concluded that the issue of cost might be addressed by emphasizing the low cost of many F & V relative to other foods and encouraging low-income shoppers to stretch their food dollars by buying produce in season, purchasing sale items, and shopping at farmer's markets (Treiman et al., 1996).

WIC Farmers’ Market Nutrition Program

Given that cost is a significant barrier to F & V consumption among low-income populations, providing an economic incentive to visit farmers’ markets is one approach

to increase F & V intake. The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Farmers' Market Nutrition Program (FMNP) was first initiated in 1986 when several states began to use farmers' markets to make fresh F & V available to WIC participants. Congress then authorized a three-year demonstration project in 1988 to test the concept in ten states. The project's success led Congress to enact the WIC Farmers' Market Nutrition Act of 1992 (P.L.102-314) and currently the program is reauthorized through 2015 as part of the Healthy, Hunger-Free Kids Act of 2010 (Catalog of Federal Domestic Assistance: WIC FMNP," n.d., WIC FMNP: United States Congress. House Committee on Agriculture, 1992). The program was created to encourage WIC participants to shop more frequently at farmers' markets with the aim of increasing the consumption of fresh F & V among WIC participants.

In order to qualify for the FMNP benefits, one must be a WIC participant who is currently pregnant, breastfeeding, or postpartum, or an eligible child between the ages of 3-5 years ("Quick Facts: WIC Farmers' Market Nutrition Program," n.d.). The benefit is allocated only once per year, per participant. The minimum federal benefit per participant is \$10 while the maximum benefit is \$30. Thus, the actual benefit amounts vary per state. For example, North Carolina allocates \$24 per individual (6 coupons x \$4 each). In 2012, the program supplied fresh produce to more than 1.9 million WIC families, providing more than \$16.4 million in income for more than 18,000 small farmers (Farmers' Market Coalition, 2013). Over 4,000 farmers' markets in the U.S. accept WIC FMNP coupons and roughly sixty of those markets are in North Carolina ("NCDA&CS - Agricultural Statistics Division," 2012; "USDA Directory"

n.d.). Thus, the creation of the FMNP increases accessibility to fresh produce for low-income individuals while stimulating the local economy - both important benefits, socially and politically.

Another goal of the program is to revitalize rural areas by keeping the farmers' share of the food dollar local (WIC FMNP: United States Congress. House Committee on Agriculture, 1992). The program has been successful at stimulating business for local farmers and creating greater awareness of farmers' markets in local communities. Several studies have documented the positive impacts of FMNP on farmers (Henry et al., 2003; Just & Weninger, 1997). Farmers directly benefit from the program since they receive the full face value of each FMNP coupon redeemed by participants. Just and Weninger (1997) conducted an economic evaluation of WIC FMNP using data from six states. Their study found that farmers gained 7 to 9% more than the coupon redemption through additional purchases. Furthermore, research shows that the majority of farmers are satisfied with the FMNP program since it contributes money to the local economy and allows farmers to broaden their client base (Holben, 2010; National Association of Farmers' Market Nutrition Programs, 2001). In fact, at farmers' markets in low-income areas, sales to WIC and SNAP clients account for the majority of total sales (Henry et al., 2003; National Association of Farmers' Market Nutrition Programs, 2001; Farmers Market Coalition, 2013). A recent report from the Farmers' Market Coalition concludes that FMNP coupons made up as much as 59% of total sales for a single farmers' market (Farmers' Market Coalition, 2013).

Despite generating benefits for farmers and communities, the program is constantly at risk of budget cuts. Prior to 2012, the federal appropriation for the program was \$20 million, in addition to state matching requirement of 30% for administrative costs (Catalog of Federal Domestic Assistance: WIC FMNP,” n.d.). The program was reduced to \$16.8 million in federal funds in 2012, and was further cut to \$15.3 million in 2013, a figure 24% lower than the appropriation established under the Healthy, Hunger-Free Kids Act. For the 2013 FMNP season, the state of North Carolina operated on roughly \$200,000, though the proposed allocations for 2014 season are about 25% lower due to further anticipated cuts to the federal budget (NC Nutrition Services Branch, personal communication, November 2013).

Coinciding or possibly a reason for the decrease in allotted funding for the FMNP is the low level of coupon redemption, a measure of program utilization that reflects the number of coupons redeemed by WIC participants, deposited by farmers, and processed through a central banking system. Underutilization of the program could lead to its demise. Thus, it is important to examine redemption rates of FMNP coupons which provide information about the number of WIC families that might be benefiting from the program (Conrey, Frongillo, Dollahite, & Griffin, 2003; Herman et al., 2008). Furthermore, exploration of redemption rates can offer insight regarding the extent to which WIC participants visit farmers’ markets to purchase fresh F & V. A trend analysis of FMNP coupon redemption data in North Carolina reveals that on average 44% of coupons have been redeemed each year since 2010. The aggregate redemption rate statewide in North Carolina for the 2012 WIC FMNP season was only 47% (NC

Nutrition Services Branch, personal communication, April 2013), a figure lower than the national average, further illustrating the need for effective solutions to increase coupon redemption.

Previous WIC FMNP Research

Efforts have been made to address economic barriers to accessing healthy foods through financial voucher programs such as the WIC FMNP. Research indicates that participation in WIC FMNP is associated with improved access to F & V and a greater likelihood of shopping at farmers' markets although redemption rates of coupons remain low (Anliker, Winne, & Drake, 1992; Conrey et al., 2003; Grace et al., 2007; Racine, Smith Vaughn, & Laditka, 2010). The National Association of Farmers' Market Nutrition Programs evaluated perceptions about WIC FMNP among participants ($n = 24,800$) and farmers ($n = 2,561$) in 2002. Survey and sampling procedures were not described and overall response rate was not reported. However, 30 WIC program centers were targeted. The survey included questions about F & V intake and shopping at a farmers' market. Overall, 73% of program participants reported that they ate more fresh produce during summer 2002 compared to the previous summer, and 79% planned to eat more fresh produce year-round. Findings indicated that 42% of program participants had never previously been to a farmers' market, 54% spent money at the market in addition to coupons, and 73% planned to continue shopping at farmers' markets once their coupons were gone. Nearly all responding farmers (90%) reported that participating in the FMNP increased their farmers' market sales (National Association of Farmers' Market Nutrition Programs, 2001).

Anliker et al. conducted one of the first evaluations of WIC farmers' market programs before the inception of the national-level FMNP program. The Connecticut Farmers Market Coupon Program for WIC participants, which was evaluated in a treatment-control group design, showed that those who received coupons were more likely to use farmers' markets, but that there was no overall impact on their F & V consumption (Anliker et al., 1992). Pre-assessment interviews ($n = 489$) and follow-up surveys ($n = 216$) were completed about two months apart. A short FFQ was used to assess intake of fresh, canned, and frozen F & V during the previous month. Changes in F & V intake that occurred between pre-assessment and follow-up surveys did not differ significantly between those who received and/or used coupons and those who did not. Women who received coupons and spent additional money or SNAP (formerly known as food stamps) at the farmers' market showed greater increases in the consumption of dark-orange vegetables, fresh tomatoes, and peppers than those who did not use additional resources. Similarly, women who went back to the farmers' market after using all their coupons reported significantly greater increases in the consumption of fresh dark-green vegetables and fresh cabbage or cauliflower than those who did not return to the market. Strengths of this study included the pre/post design, use of a control group, and diversity of participants enrolled.

Numerous studies have found that participation in WIC FMNP results in a greater intake of F & V (Anderson et al., 2001; Herman et al., 2008; Joy, Bunch, Davis, & Fujii, 2001; Kropf, Holben, Holcomb, & Anderson, 2007; National Association of Farmers' Market Nutrition Programs, 2001). Participating in WIC FMNP can increase

fresh F & V consumption by approximately one full serving for low income women (Racine, 2010; Joy, 2001). Joy et al. administered pre and post surveys to a random sample of 10,991 FMNP participants in California. Of those, 2,000 surveys (18%) were chosen for analysis using a stratified sampling technique. The purpose of the study was to investigate F & V consumption practices, as well as views of the FMNP program among participants. The initial survey, given before FMNP coupons were issued, contained questions relating to demographics, experience shopping at farmers' markets, number of servings of F & V consumed the previous day and, finally, two open-ended questions requesting feedback. The follow-up survey, given one month later, had seventeen questions, including "Did FMNP encourage you to eat more fruits and vegetables?" Of the total respondents ($n = 2000$), 92% said it was their first time receiving FMNP coupons, while only 15% had previously been to a farmers' market. Between pre and posttest, there was a statistically significant increase in the amount of F & V consumed by almost one serving ($p < 0.05$). The total intake of F & V was 4.50 servings per day in the group that used coupons compared with 3.56 in the group that did not use coupons. The follow up survey revealed that 58.2% said the quality at the farmers' market was better than that at the grocery store. In terms of payment at the farmers' market, 51% percent said they spent their own cash, 11.7% used SNAP and 10.7% used both, in addition to FMNP coupons (Joy et al., 2001).

Anderson et al. (2001) evaluated the Michigan FMNP in one county in order to determine the effect of the program on F & V consumption. Pre- ($n = 564$) and post-assessment ($n = 455$) surveys assessed F & V intake, using items modified from the

BRFSS survey, in addition to attitudes about buying, preparing and eating F & V. This study compared three groups: families receiving FMNP coupons alone, those receiving nutrition education alone, and those receiving a combination of both coupons and nutrition education. The authors concluded that the reported change in servings of F & V was greatest among those receiving a combination of coupons and nutrition education ($p < .05$; $M = 3.70$). Furthermore, those receiving the education component had a significant association with change in attitude about F & V ($\beta = 0.17$); yet, the coupon component had a significant association with F & V consumption behavior ($\beta = 0.33$). Herman et al. (2008) compared women who received financial incentives to shop at farmers' markets versus the grocery store. Women ($n = 602$) at three WIC sites in Los Angeles were assigned to an intervention (farmers' market or supermarket, both with redeemable food vouchers) or control (a small incentive). The intervention group received bimonthly vouchers valued at \$10 per week. The control group was given coupons valued at \$13 to be used for disposable diapers. Interventions were carried out for 6 months, and participants' diets were followed for an additional 6 months, revealing an increase in their consumption of F & V among intervention participants. Farmers' market participants showed an increase of 1.4 servings per 1000 kcal ($p < .001$) from baseline to the end of intervention compared with controls. Supermarket participants showed an increase of 0.8 servings ($p = .02$), illustrating that women who used the financial incentives at farmers' markets significantly increased their F & V intake compared to women who used the incentives at grocery stores. Furthermore, those in the intervention group sustained the increase 6 months after the intervention

was terminated (model adjusted $R^2 = .13, p < .001$) (Herman DR et al., 2008). Kropf and colleagues (2007) assessed psychosocial indicators of F & V intake. They carried out a cross-sectional survey to estimate differences in dietary intake among women enrolled in Ohio WIC programs and receiving farmers' market coupon benefits compared to those receiving no coupons. Participants receiving FMNP coupons ($n = 65$) reported a significantly higher mean daily intake of vegetables (2.23 ± 1.18 servings) compared to women not receiving coupons ($n = 170, 1.91 \pm 0.98$ servings). However, fruit intake did not differ between groups.

A few studies have revealed barriers and facilitators to market usage and redemption of food assistance benefits at farmers' markets. Racine and colleagues (2010) examined farmers' market use among WIC participants in Washington, DC and Charlotte, NC. Mecklenburg County, where Charlotte is located, was not a WIC FMNP participating county and served as a comparison group for Washington DC. Overall, the results showed that women who redeemed FMNP coupons were more likely to visit farmers' markets to purchase fresh F & V. Previous participation in the FMNP (OR: 3.30; 95% CI: 1.57 to 6.93), previous redemption of FMNP coupons (OR: 4.96; CI: 2.15 to 11.45), and higher F & V intake (OR: 2.59; CI: 1.31 to 5.12) were associated with farmers' market use. Among women who did not shop at farmers' markets, lack of a farmers' market location near their home was the most frequently cited barrier, especially by participants in Charlotte (25%), along with lack of transportation. Moreover, study by Grace (2007) revealed that price was a main barrier keeping food stamp clients from shopping at the farmers' market, along with lack of

transportation, limited hours, and inconvenient market location. Schneider and colleagues (2012) further noted that non-Hispanic WIC clients were less likely to redeem vouchers if barriers such as lack of variety, parking, distance, and unfavorable weather existed. Joy et al. (2001) found that several FMNP participants asked for improvements in the location and operating times of the farmers' markets. One participant suggested that more farmers' markets are needed "because I had to take a bus across town to get to the one that used the coupons," while another asked that the markets stay open longer, as "it is hard to get there before 1 p.m."

Meanwhile, only one WIC FMNP study has directly investigated coupon redemption rates. Conrey et al. (2003) found that a coordinated effort of four different program components increased FMNP coupon redemption rates in New York State, one of the largest beneficiaries of the FMNP program. These program enhancements included hiring a statewide FMNP coordinator, increased collaboration among state and local agencies, local-level community capacity building (i.e. identifying and leveraging key stakeholders), and distribution of new nutrition education resources. Redemption rates from 1996-2000 were analyzed using linear regression, revealing that redemption decreased by an average of 2.36% each year ($p = 0.002$, $n = 5$) before the program enhancements. The post intervention rate of 59.7% was higher than the predicted redemption rate of 57.43%. The 2001 rate of 59.7% reflected an increase of up to \$316,000 for F & V purchases by WIC families (Conrey et al., 2003). The authors concluded that program enhancements at state and local levels are effective in

increasing coupon redemption, and in turn, revenue for local farmers. This study highlights the importance of leveraging resources at the local or community level in order to work towards addressing barriers to FMNP redemption.

While the results of these studies are promising, limitations are numerous. These studies were predominantly cross sectional and conducted in only a small number of states—Connecticut, Ohio, Michigan, New York, North Carolina, and California—and may not be generalizable to women in other states. Also, some participants had year round farmers’ market access while others did not, which could directly impact F & V intake. Furthermore, the majority of these studies offered an economic incentive, and it is unknown if simply increasing farmers’ market access would have the same results. None of these studies address the role of physical access (i.e. market location). In all of these studies, the farmers’ markets available to participants were already present in the community, and were not newly developed and introduced into the community, or as a program component specifically targeting the WIC population.

Farmers’ Markets

Due to the growing awareness and demand by consumers around the country for local, sustainable agriculture, the number of farmers’ markets is on the rise (Brown, 2001). The USDA reported a 9.6% increase in farmers’ markets from 2011 to 2012 alone, and there has been a 200% increase over the past 15 years (USDA, 2012). In 2009 the Centers for Disease Control and Prevention (CDC) called for an increase in the number of farmers’ markets, and the percentage of farmers’ markets that accept

electronic benefits transfer (EBT) and WIC FMNP coupons (Goodman, 2009). A farmers' market is defined as "a common facility or area where several farmers or growers gather on a regular, recurring basis to sell a variety of fresh F & V and other locally-grown farm products directly to consumers" (Hamilton, 2002). According to the Farmers' Market Coalition, a farmers' market is "organized for the purpose of facilitating personal connections that create mutual benefits for local farmers, shoppers and communities" (Farmers Market Coalition, 2012.). Farmers markets provide an excellent opportunity for farmers to establish relationships with their community members, cultivate loyalty, and to educate customers about local agriculture (Andreatta & Wickliffe, 2002; Corum, Rosenzweig, & Gibson, 2001; Fisher, 1999; Markowitz, 2010). According to the USDA National Farmers' Market Manager Survey, farmers' market sales generate over one billion dollars annually, and over 25% of farmers depend on the market as their only source of revenue (USDA, 2009). Yet, the benefits extend beyond economics when one considers the impact farmers' markets have on promoting sustainability and local agriculture. Fresh produce at a farmers' markets is known to be in season and at the peak of nutrient density as compared to produce sold at grocery stores. This is likely due to shorter transit, since nutrient density decreases as time elapses from harvest (Bourn & Prescott, 2002). Moreover, farmers' markets have been an important part of the efforts in improving intake of F & V among Americans who participate in food assistance programs like WIC (Anderson, et al., 2001; Anliker et al., 1992; Conrey et al., 2003; Dollahite, Nelson, Frongillo, & Griffin, 2005; Herman et al., 2008; Kropf et al., 2006). Farmers market managers and

direct marketing farmers are crucial in connecting nutrition assistance clients to quality fresh F & V. These groups arrange times and places for people to reap the benefits of local agriculture. Additionally, they are often the individuals who make decisions about participating in federal food assistance programs, and recruit farmers to sign up for those programs (Andreatta & Wickliffe, 2002; Holben, 2010).

Although the growth in new farmers' markets represents an exciting opportunity for farmers and consumers, the benefits of farmers' markets and their access to fresh F & V are disproportionately distributed. The average farmers' market customer is white, middle-aged, middle to high income, and well-educated. This customer profile tends to also reflect the overall communities in which the majority of farmers' markets are located (Leone et al., 2012; Wolf, Spittler, & Ahern, 2005). In a study examining characteristics of local food consumers ($n = 2932$) in North Carolina, Racine and colleagues revealed only half of families had purchased local produce in the last month. These families were more likely to be rural, white, lower income, or have children with health needs and/or a high daily consumption of F & V. The authors concluded that more interventions to promote local produce are needed, especially in African American communities (Racine, Mumford, Laditka, & Lowe, 2013).

Research by Andreatta and Wickliffe (2002) highlights benefits of farmers' markets, as well as barriers to market usage. The authors conducted an in-depth case study of a North Carolina farmers' market located in Guilford County. This study revealed facilitators to market usage - for example, many customers treated shopping at the market as a "nice outing" with their family and friends and valued the opportunity

to buy produce in season. Other facilitators noted were high quality products and the relationships with local farmers. However, the major barrier identified in this study was distance traveled to the farmers' market. Surveys found that 86% of customers traveled 6 or more miles, and 15% traveled over 20 miles to reach the market. Cost, conversely, was not considered a barrier of concern among customers, which illustrates how promoting farmers' markets can be a promising solution to the reducing the cost of fresh F & V for low-income groups. Analysis of prices for F & V at farmers' markets and supermarkets in twelve North Carolina counties revealed a cost savings of over 17% for produce at farmers' markets (McGuirt, Jilcott, Haiyong Liu, & Ammerman, 2011). A recent study with low-income women in eastern North Carolina examined the influence of price and accessibility on willingness to shop at farmers' markets, citing that participants were most motivated to shop at the farmers' market when the market was in close proximity to their home compared with the supermarket and when the farmers' markets offered discounts on produce. Participants were least motivated to shop at the farmers' market when the price savings was only 5% and the market was 15 minutes away from their home (McGuirt et al., 2013). Other studies have identified that people tend to have a positive attitude towards the quality of F & V at farmers' markets, including the idea that F & V at farmers' markets are less expensive than supermarkets (Leone et al., 2012; Treiman et al., 1996). Farmers' markets help to improve access to a variety of fresh F & V at a reasonable price and are known to have

higher quality and a better taste as compared to supermarket produce (Andreatta & Wickliffe, 2002; McGuirt et al., 2011; Wolf et al., 2005). This is key since increasing access to affordable and variety of quality F & V is emerging as a strategy for promoting public health.

Previous Farmers' Market Implementation Research

Another strategy to increase F & V intake among low-income groups is the development of new farmers' market locations. There are currently very few studies focused on the development of new farmers' markets though existing studies show promising results (Concannon, Martin, & Erauth, 2011; Evans et al., 2012; Freedman et al., 2011; Freedman et al., 2013). In these studies, community members were more satisfied with the quality, variety, and prices of F & V offered at the farmers' markets compared to options in local food stores. However, establishing markets in low-income neighborhoods presents a variety of challenges. Farmers' markets, in addition to providing affordable F & V, must be situated in convenient locations and provide viable business opportunities for farmers (Allen & Guthman, 2006; Fisher, 1999).

Markowitz (2010) explored access to and implementation of farmers' markets in low-income communities by examining the problems of farmers' market development in Louisville, Kentucky. The author stressed that local government can provide legitimacy and material support to farmers' market programs. Material support includes the extension of buildings and facilities, like parking lots. Furthermore, community outreach, including marketing and advertising is likely key to making these markets work. Markowitz sees subsidies for F & V, such as FMNP, as critical to both

establishing a market infrastructure and making fresh produce affordable for low-income individuals. These are all important considerations when developing a new farmers' market location. Larsen and Gilliland (2009) evaluated the impact of opening a farmers' market in London, Ontario. They were specifically interested in whether the market would have an impact on the price and availability of healthy foods in a food desert. The introduction of the farmers' market caused a 12% decrease in prices over a period of three years at the grocery stores in the surrounding neighborhood (Larsen & Gilliland, 2009). The market also increased the variety and accessibility of fresh F & V in an area previously classified as a food desert.

A case study by Freedman, Bell, & Collins (2011) examined a farmers' market execution, titled the Veggie Project. They developed on-site farmers' markets at Boys and Girls Clubs in the Nashville, Tennessee area. The authors asked one key question—if you build it, will they come? Over the course of the season, 34 on-site markets were held across four sites. Participants were provided with financial incentives in the form of vouchers (up to \$20) to shop at the market. Farmers' market utilization was determined based on detailed food receipts that were kept for each transaction. The vouchers represented 63% of all produce sold, and the remainder was cash. Prices of fresh F & V were recorded on a price per unit basis, with prices ranging from \$0.25 for a single Idaho potato and \$3.50 for one pint of blueberries. Of the adults surveyed who had never shopped at a farmers' market, 73% were “very interested” in the farmers' market and 27% were “somewhat interested.” Repeat customers came to the market up to eleven times. Furthermore, the authors conducted qualitative

interviews with project stakeholders who thought the markets were conveniently located, F & V were reasonably priced, and a wide-variety of seasonal produce was offered. Interviews with youth and parents involved in the Boys & Girls Clubs articulated that they were aware of barriers to accessing healthy foods in their community, including high costs and poor quality of fresh produce in their community and limited transportation options. One youth stated that food available at the farmers' market put his "taste buds back in business!" The authors concluded the project resulted in increased access to fresh F & V, especially among youth in the community, and that the economic incentives were particularly useful. However, this study has some limitations including use of a convenience sample and absence of a comparison group (Freedman et al., 2011).

Another more recent study by Freedman (2013) placed a farmers' market at a federally qualified health center in order to target low-income diabetics in rural South Carolina. This study utilized a Community-Based Participatory Research (CBPR) approach, including the development of a ten-member community action council to guide the implementation of the market. The on-site market operated once per week for 22 weeks and was managed by a hired community member. Accepted forms of payment included SNAP EBT, WIC FMNP, and SFMNP benefits and cash. Additionally, participants ($n = 41$) were provided with financial incentives (vouchers) to use at the market for fresh F & V, which were valued up to \$50. Participants were given these vouchers after completing two surveys. Results showed that 70.7% of participants paid for F & V with study vouchers and at least one other form of payment

(e.g. cash or SNAP) while 29.3% only used the study vouchers. Strengths of this study include the use of three data collection time points and validated tools to measure F & V intake, the primary outcome measurement. Overall, F & V intake increased by 1.6 servings between time 1 and time 2, though there was no statistical significance at time 3. The authors also stressed the importance of using a financial incentive program as those who used vouchers were significantly more likely to increase F & V consumption (Freedman et al., 2013).

One study by Evans et al. (2012) introduced two farmers' markets in ethnically diverse, low-income neighborhoods in East Austin, Texas. The purpose of this longitudinal study was to measure if a farmers' market alone would increase F & V intake without any other intervention components such as financial vouchers and advertisements in the community. Participants living in a 0.5-mile radius of the farm stands were recruited via door-to-door. The demographic profile was mostly female, African American or Hispanic, and had children. Of the 61 participants, 17% received WIC and 41% received SNAP. These markets accepted SNAP, WIC FMNP, and cash and specifically targeted individuals who lived in a walkable distance to the market (0.5 mile radius). The two farmers' markets occurred for 12 weeks, once per week outside of a local community site and offered a variety of F & V. Only F & V were allowed to be sold at the markets. Data collected before the farmers' markets revealed that the average F & V intake was 3.98 servings per day, with the largest contributors being "fruit juice" and "other vegetables." Significant increases in F & V intake were noted post intervention, especially for whole fruit, tomatoes, and green salad. Furthermore,

significant increases were seen for the percent of participants who were aware of the farmers' market in the neighborhood and reported purchasing F & V there (Evans et al., 2012). This study was limited by the lack of a control group and a small sample size, though was novel in its approach to focus only on market implementation instead of other intervention components.

There is only one study (Concannon et al., 2011) that has focused on farmers' market implementation in WIC clinic parking lots though the full results of the study have not been published. The author established a partnership with the University of Maryland Cooperative Extension, Baltimore Department of Public Health, and local farmers in order to locate a new farmers' market at the WIC clinic. These markets were not recurring on a weekly basis, and appear to have sporadically occurred over the course of six years. Based on results found in an abstract (2011) the market occurred only eleven times since 2005 as they were "1-day" farmers' markets. The author concluded that WIC participants were able to "experience" shopping at a farmers' market, improved farmers' market participation rates, and that local farmers increased revenue by approximately \$700-\$1000 during each of the 1-day WIC farmers' markets. Further details of this study are not available but these findings illustrate the need for evaluation of farmers' markets located at WIC clinics in order to determine their overall value as health promotion tools. The findings of these studies suggest that introducing farmers' markets to low-income neighborhoods, which previously had poor access to healthy foods, could potentially improve accessibility to affordable fresh produce while lowering the risk of chronic disease in the long term.

Approach for the Project: Community-Based Participatory Research

CBPR, a type of action research, is one potential approach to establishing farmers' markets in low-income neighborhoods, as demonstrated in the aforementioned study by Freedman et al. (2013). The beginnings of action research have been credited to Kurt Lewin, who developed the method in the 1940s as a way to use research for making planned social change (Lewin & Gold, 1999). A number of recent public and private national initiatives have invested in CBPR in public health, including the CDC's urban research centers and prevention research centers, the National Institute of Environmental Health Sciences' translational research grants, and the W.K. Kellogg Foundation's Community-Based Public Health Initiative. Israel et al defined CBPR as focusing on social, structural, and physical environmental inequities through active involvement of community members, organizational representatives, and researchers in all aspects of the research process. Partners contribute their expertise to enhance understanding of a given phenomenon and integrate the knowledge gained with action to benefit the community involved (Israel et al., 2001; Israel et al., 2008). The label CBPR is used to acknowledge the fundamental characteristic that emphasizes the participation, influence and control of non-academic researchers in the process of change.

Characteristics of the CBPR approach include: (a) recognizing the community as a unit of identity, (b) building on the strengths and resources of the community, (c) promoting co-learning among research partners, (d) achieving a balance between research and action that mutually benefits both science and the community,

(*e*) emphasizing the relevance of community-defined problems, (*f*) employing a cyclical and iterative process to develop and maintain community/research partnerships, (*g*) disseminating knowledge gained from the CBPR project to and by all involved partners, and (*h*) requiring long-term commitment on the part of all partners (Israel et al., 2008).

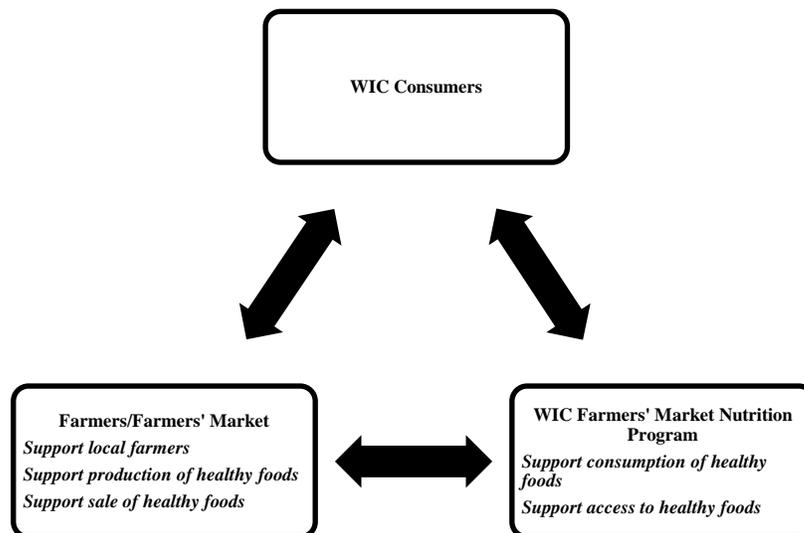
The strengths of CBPR are abundant. CBPR allows for innovative use of existing resources, leverages the knowledge of community members which increases credibility, empowers people by considering them change agents, address problems and provides workable solutions in the community, among other strengths. CBPR also helps join research participants and stakeholders with varied skills and expertise in addressing intricate problems in the community. A relevant example of a CBPR project focusing on farmers' markets is Freedman's (2013) study with low-income diabetics in South Carolina. This study used a group of community advocates and stakeholders to guide the implementation of the farmers' market. CBPR shows promise as an approach in working towards the reduction of health disparities since it addresses problems in a real world context, and provides achievable and sustainable solutions to those problems.

Conceptual Model for the Project

As shown in Figure 1, the proposed conceptual model for this project outlines the influence of both the WIC FMNP program and farmers' markets on improving access to healthy foods for WIC consumers. This model is informed by the model of Community Nutrition Environments by Glanz et al. (2005). In particular, the proposed model incorporates constructs of the consumer nutrition environment, including accessibility of farmers' markets and the production of healthy food options. The WIC

FMNP supports both the consumption of and access to healthy foods, while farmers' markets support the production and sale of healthy foods. These components of the model have the potential to positively influence the shopping and dietary habits of WIC consumers by increasing exposure to a variety of F & V and also by increasing intake. Thus, it is important to improve accessibility of farmers' market locations while also protecting the WIC FMNP and supporting local farmers. This model is used to inform the development of farmers' market locations in convenient places for WIC consumers, such as WIC clinic parking lots.

Figure 1. Food and Nutrition Resources for Healthy Foods



Summary

A significant knowledge gap remains for best practices to implement farmers' markets in low-income communities, particularly in food deserts and locations such as WIC clinics. Case studies reporting on market implementation and logistics would be useful to help communities located in food deserts create new market sites, specifically in locations such as local health departments, WIC clinics, Department of Social Services, and other places where social service benefits and healthcare are administered to low-income clients. In addition to outreach and dissemination of information about market locations, hours, and accepted forms of payment, environmental barriers to farmers' markets are often quoted as barriers for FMNP use in general yet little is known about how to effectively confront these barriers. In particular, market location, accessibility, and usage need to be addressed (Andreatta & Wickliffe, 2002; Leone et al., 2012; Markowitz, 2010). More studies are needed to not only understand but to also diminish or reduce these barriers at the community-level. There is currently no literature about addressing barriers to FMNP participation and coupon redemption in North Carolina. Given the low FMNP coupon redemption rates and the high risk of federal budget cuts, additional studies focusing on strategies to increase FMNP coupon redemption rates at the state and national level are also desperately needed.

CHAPTER III
PROCESS EVALUATION OF FARMERS' MARKET IMPLEMENTATION

Abstract

The present study planned and implemented a new farmers' market, the Catawba County Public Health Farmers' Market (CCPH FM) at the local WIC office in Catawba County, North Carolina, of which WIC Farmers' Market Nutrition Program (FMNP) participants were the main target audience. The purpose of this farmers' market was to provide convenience and improve access to locally grown fresh fruits and vegetables (F & V) in the community and to increase the FMNP coupon redemption rate. The main objective of this study was to describe the overall process and key strategies involved in implementing a farmers' market at a WIC office. This is the first study to assess a farmers' market operated in close proximity to a WIC clinic and helps to fill the knowledge gap concerning best practices to implement farmers' markets at sites such as WIC clinics. A community-based participatory research design using different formative methods documented the process and key inputs in farmers' market implementation. Multiple measurement methods included direct observation and semi-structured interviews with staff and farmers ($n = 13$). Interviews were analyzed using the constant-comparative method. Other formative methods included ground truthing, direct observation, and review of documents. A community partnership among WIC, Eat Smart Move More, local farmers, UNC Greensboro, and CCPH was key in implementing an

onsite farmers' market. The market occurred weekly over the course of 24 weeks. Overall, twelve WIC-approved farmers sold at the market and offered more than 50 types of locally grown F & V. The results demonstrate that a farmers' market can be successfully located near a WIC clinic with positive effects of increasing access to fresh F & V by a low-income population.

Key words: Farmers' market, WIC FMNP, implementation, process evaluation, CBPR

Introduction

Fruits and vegetables (F & V) are an essential component of a healthy diet due to their high nutrient density and abundant health promoting qualities. However, nearly all Americans fail to meet the recommended guidelines of at least "five a day" for F & V consumption (Blanck, Gillespie, Kimmons, Seymour, & Serdula, 2008; "Fruits & Veggies More Matters," 2013). Under-consumption of F & V is a major risk factor for chronic diseases, including obesity, heart disease, stroke, type 2 diabetes, and some cancers (Hung et al., 2004; Serdula et al., 1996). Despite a national public health focus on increasing F & V consumption through various programs and promotions like *MyPlate*, F & V intake remains suboptimal across all groups in the U.S. while rates of chronic diseases, such as heart disease and obesity, are on the rise.

Literature related to intake of fruits and vegetables indicates that limited access and availability of fresh produce along with the high price of fresh F & V are the two primary factors which contribute to under-consumption of F & V among low-income groups (Glanz, Basil, Maibach, Goldberg, & Snyder, 1998; Haynes-Maslow, Parsons, Wheeler, & Leone, 2013; Herman, Harrison, Afifi, & Jenks, 2008; Larsen & Gilliland,

2009). Consequently, it has been noted that low socioeconomic status (SES) is a major risk factor for inadequate consumption of F & V and chronic diseases (Dubowitz et al., 2008). Creating greater access to affordable, quality fresh F & V is one of the key strategies in improving diet quality and promoting health among low-income Americans in particular (CDC “Strategies to Prevent Obesity and Other Chronic Diseases,” 2011).

According to the U.S. Census Bureau, more than 46 million (15%) Americans live below the poverty line (U.S Census Bureau, 2012). One in seven Americans is food insecure, meaning they have anxiety about running out of money to buy food and may compromise on the quality of food and/or experience hunger (USDA ERS, 2013). These Americans face the greatest difficulty obtaining the full range of a healthy diet, especially fresh F & V. Improving physical and economic access to fresh F & V can increase intake (Grimm, 2010), and a number of studies have implemented strategies to foster access to healthy foods, including efforts to locate supermarkets in food deserts, promote healthy corner stores, offer economic incentives to purchase healthy foods, develop mobile farm stands and community supported agriculture programs, and to expand farmers’ markets (Freedman, Bell, & Collins, 2011; Grimm et al., 2010; Holben, 2010; Morton & Blanchard, 2007). Improving access to local farmers’ markets is one targeted approach for connecting low-income communities with produce at the peak of nutrient density.

In 2011, the Centers for Disease Control and Prevention (CDC) identified ten strategies to increase F & V consumption, including to “start or expand farmers’ markets in all settings” (CDC “Strategies to Prevent Obesity and Other Chronic Diseases,” 2011). The number of farmers’ markets has grown exponentially over the past 15 years, and the

USDA reported a 13.2% increase in farmers' markets from 2011-2013 (USDA, 2013). Moreover, farmers' markets have been an important part of the efforts to bring nutritious foods to Americans who participate in food assistance programs like the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and in 2009 the Centers for Disease Control and Prevention (CDC) called for an increase in the number of farmers' markets that accept WIC Farmers' Market Nutrition Program (FMNP) coupons (Anderson, et al., 2001; Anliker et al., 1992; Conrey et al., 2003; Dollahite, Nelson, Frongillo, & Griffin, 2005; Goodman, 2009; Herman et al., 2008).

The WIC FMNP was established by Congress in 1992 in order to encourage WIC participants to shop more frequently at farmers' markets and to keep the farmers' share of the food dollar in the local economy (WIC FMNP: United States Congress House Committee on Agriculture, 1992). In 2012, the FMNP program supplied fresh produce to more than 1.9 million WIC families, providing more than \$16.4 million in income for more than 18,000 small farmers (Farmers' Market Coalition, 2013). Thus, the creation of the FMNP increases accessibility to fresh produce for low-income families while stimulating the local economy - both important benefits, socially and politically.

Research indicates that participation in WIC FMNP is associated with increased access to local fresh produce, along with improved intake of F & V and a greater likelihood of shopping at farmers' markets (Anliker, Winne, & Drake, 1992; Conrey et al., 2003; Grace et al., 2007; Racine, Smith Vaughn, & Laditka, 2010). Farmers and farmers' market managers are crucial in connecting nutrition assistance clients to quality fresh F & V, and are the ones who arrange the times and places for the farmer's market

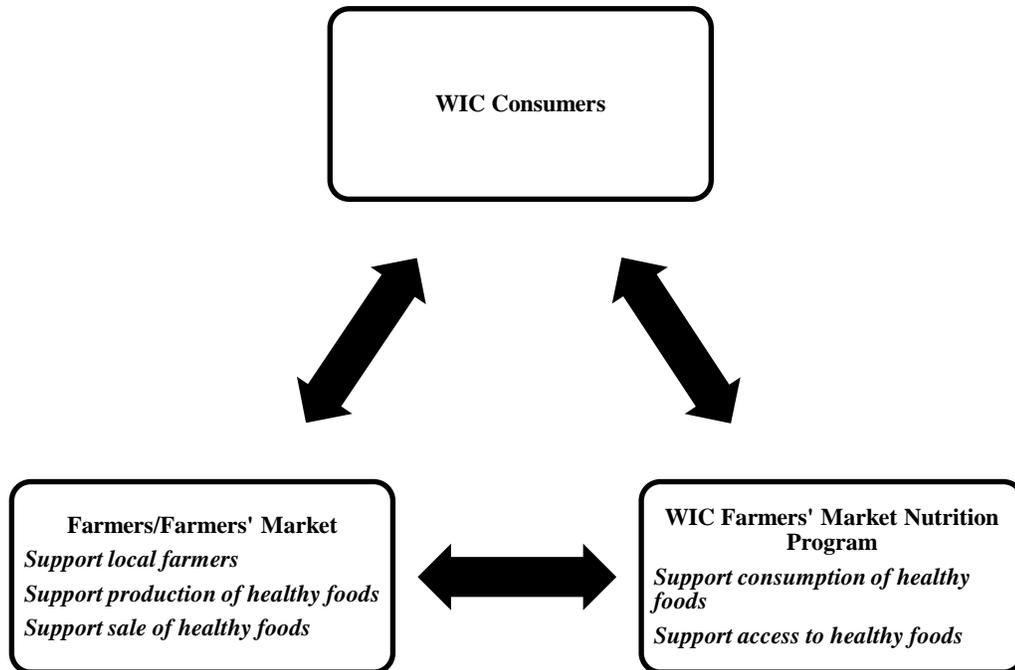
and setting up the system to redeem WIC FMNP coupons. However, multiple barriers prevent FMNP participants from redeeming coupons, such as lack of transportation to market locations and limited hours of market operation (Joy, Bunch, Davis, & Fujii, 2001; Racine et al., 2010; Schneider, McDonnell, & Neyman Morris, 2012). One strategy to address these barriers is the development of new farmers' market locations in convenient places where social services and/or healthcare are administered in the community (Concannon, Martin, & Erauth, 2011; Freedman et al., 2013).

Rationale for Establishing WIC Clinic Farmers' Markets

There are currently very few studies describing the process of setting-up new farmers' markets, and only one of those studies specifically targeted WIC participants (Concannon, Martin, & Erauth, 2011; Evans et al., 2012; Freedman et al., 2011; Freedman et al., 2013). Results of these studies indicate that community members were more satisfied with the quality, variety, and prices of F & V offered at the farmers' markets compared to options in local food stores. Markowitz (2010) explored access to and implementation of farmers' markets in low-income communities situated in Louisville, Kentucky. Results of this study indicated that local government plays an important role in supporting farmers' markets by legitimizing and providing material support such as the extension of buildings and facilities like parking lots. Furthermore, community outreach, including marketing and advertising is important to the success of these markets. These are all central considerations when developing a new farmers' market location, though establishing markets in low-income neighborhoods presents a variety of challenges. Farmers' markets, in addition to providing affordable F & V, must

be situated in convenient locations to improve physical access to local communities and provide viable business opportunities for farmers (Allen & Guthman, 2006; Fisher, 1999). The state of North Carolina is one of the most diversified agricultural states in the nation and one of the top ten states in agriculture production contributing \$70 billion annually to the state's economy (“NCDA&CS - Agricultural Statistics Division,” n.d.). However, access to local, fresh fruits and vegetables has not reached its full potential in this state and overall a significant knowledge gap remains for best practices to implement farmers’ markets in low-income communities. Furthermore, WIC FMNP has been implemented to encourage consumption of local, fresh F & V among low-income populations; however, redemption rates of FMNP coupons are low. One of the major barriers identified in the literature, along with personal communication and surveys from the State of North Carolina Nutrition Services Branch (NSB), is physical location (NSB, personal communication, 2012; Joy et al., 2001). Hence, to improve redemption rate and thereby intake of F & V among WIC participants, improving physical access has been recommended as one of the top strategies. As shown in Figure 2, the proposed conceptual model for this project outlines the influence of both the WIC FMNP program and farmers’ markets on improving access to healthy foods for WIC consumers. This model is informed by the model of Community Nutrition Environments by Glanz et al. (2005). In particular, the proposed model incorporates constructs of the consumer nutrition environment, including accessibility of farmers’ markets and the production of healthy food options. The WIC FMNP supports both the consumption of and access to healthy foods, while farmers’ markets support the production and sale of healthy foods.

Figure 2. Conceptual Model for the Project



This paper describes the process of organizing and locating a farmers' market at a local health department, Catawba County Public Health (CCPH), in Hickory, North Carolina, the site of the WIC clinic. This study used a community-based participatory research (CBPR) approach to identify key components of locating and implementing a farmers' market at a WIC clinic situated in a suburban county in the western part of North Carolina. The label CBPR is used to acknowledge the fundamental characteristic that emphasizes the participation, influence and control of non-academic researchers in the process of change (Israel et al., 2008). The main objectives of this study are to 1) describe the overall process and stakeholder's involvement and participation of local

farmers in planning a farmers' market at a WIC office; and, 2) to describe key strategies and inputs involved in implementing and promoting a farmers' market located at a WIC office specifically targeting its participants.

Methodology

Study Setting

Catawba County was chosen as the intervention site due to the high level of motivation at the local health department, fiscal resources from an Eat Smart, Move More Grant, and direct experience implementing another farmers' market during the 2012 season at a local church. Moreover, Catawba County is well-suited for farmers' market promotion projects and has over 700 farms that produced \$1.24 million of fruits, vegetables, nuts, and berries in 2011. The area has a long growing season and generally favorable availability of fruits and vegetables such as apples, strawberries, watermelon, tomatoes, squash, and greens ("NCDA&CS - Agricultural Statistics Division," n.d.). However, CCPH is situated in a food desert and lacks appropriate access to fresh F & V among the population living in its vicinity. According to the USDA Food Desert Locator, CCPH is in an area that has a low-income population with low access to food at 0.5, 1, and 10 mile radius, as well as low access to food if using a vehicle (ERS, 2014).

CCPH WIC clinic parking lot served as the location of the farmers' market. This location was chosen in order to maximize visibility from the road, provide flow of vehicle and foot traffic, and minimize congestion and hazards in the parking lot. CCPH serves the community through several clinics at this location besides WIC, including

Adult Preventive Health, Dental, and Prenatal clinics. CCPH is located in between Catawba Valley Medical Center and the Catawba County Human Services Complex, which houses Catawba County Social Services. Approximately 2,300 people are employed by Catawba Valley Medical Center, CCPH, and Catawba County Social Services. Therefore, it was expected that employees and clients from these locations would also provide support for the CCPH FM. Two bus stops also serve CCPH and the Catawba County Human Services Complex, providing access to the farmers' market for public transportation users.

CCPH's WIC program serves over 4,000 participants monthly. Of this group, 2,120 WIC participants were eligible to receive FMNP coupons in 2013 (NC Nutrition Services Branch, personal communication, 2013). FMNP participants were the main target audience for the new farmers' market. In order to qualify for FMNP benefits, participants must be pregnant, breastfeeding, or postpartum or children age three to five years that are currently eligible to receive regular WIC benefits (USDA, 2013).

Study Design

A CBPR design using different formative methods documented the process and key inputs involved in farmers' market implementation. A process evaluation was used to evaluate the different components of CBPR, including identifying key steps in the establishment of the farmers' market and formation of the Community Action Council (CAC), a group of stakeholders and community advocates united around the goal of improving access to fresh F & V in the community. A process evaluation looks at how program activities are delivered in order to determine the degree to which an

intervention or project was implemented as planned and the extent to which it reached the targeted participants. Process evaluation provides us with the tools to monitor quality in order to maximize the intended benefits and evaluate the intended strategy. It also provides the information needed to make adjustments to strategy implementation in order to strengthen effectiveness (Issel, 2004). Process evaluations are particularly fitting with the documentation and dissemination of information component (*g*) of CBPR principles—i.e., the whole process of market planning, implementation, and organization was measured using a logic model (Appendix A) and was shared with other stakeholders. All study protocols were approved by the university IRB.

Data Collection and Analysis

Multiple data collection methods were used to measure the process of development of the farmers’ market and formation of the community partnership. Multiple methods were also used to document the inputs involved in farmers’ market operation and key strategies in promoting the market. Table 1 outlines the three major data collection methods that were used to meet the aforementioned objectives of the study.

Table 1. Summary of Data Collection Methods

| Data Collection Methods | Examples |
|--------------------------------|--|
| Semi-structured interviews | <ul style="list-style-type: none"> • Interviews with the participating farmers at the end of the growing season • Interviews with the selected CCPH staff at the end of intervention |

| Data Collection Methods | Examples |
|--|---|
| Ground Truthing Such as: <ul style="list-style-type: none"> • Windshield tour • Observations • Record keeping • Field notes | <ul style="list-style-type: none"> • Visit surrounding areas and observation of vicinity to assess use of promotional materials • Farmers’ market operation and observation • Attendance tracking (tally counter) • Attend WIC FMNP training • Hot Wash meetings (after-action review) • Conversations with farmers and staff |
| Review of various documents | <ul style="list-style-type: none"> • Review of promotional materials, and records on how many were distributed • Meeting minutes of CCPH staff • Meeting minutes of WIC staff • Farmer recruitment script/e-mail • Copy of market operational rules • Observation on types, variety, and price of fruits and vegetables offered each week |

Semi-Structured Interviews with Key Stakeholders

In order to collect more in-depth information on the organization process, semi-structured qualitative interviews ($n = 13$) were carried out with key stakeholders i.e., eight staff from CCPH and five local farmers who sold at the market. The purpose of the interviews was to assess barriers and facilitators related to farmers’ market implementation and sustainability and viewpoints on the impacts of the project on these individuals, including connections and relationships formed as a result of the project. Interview guides were developed for staff (Appendix B) and farmers (Appendix C). Each interview guide was divided into five main sections, providing information on the following five topics: 1) personal role in organizing or participating in the CCPH FM,

2) key steps in organizing the CCPH FM, 3) key success factors in CCPH FM operation and sustainability of the market for future seasons, 4) perceived barriers and/or other factors that limited the success of the CCPH FM and recommendations for future seasons, and 5) social, environmental, health and program related outcomes associated with the CCPH FM. Appropriate prompts were listed and provided for each section. Of the 33 staff at CCPH involved in the market implementation and/or operation, eight core team members, including the Community Outreach Manager, Market Manager, WIC Director, and Assistant Health Director were interviewed. In addition, five local farmers who sold at the market were interviewed, for a total of thirteen interviews. Of the twelve farmers who participated in the market over the course of the season, only those who were present on a regular basis were selected for interviews. These interviews were carried out at the end of the farmers' market season in November 2013-January 2014. Interviews with staff last approximately 90 minutes each while interviews with famers lasted approximately 75 minutes each. Interviews with staff and some farmers were conducted in a private area of CCPH, while the remaining farmer interviews were conducted in their private homes. Informed consent was gained (Appendix D), and all interviews were audio-recorded and transcribed verbatim.

Semi-structured interviews were analyzed using the constant-comparative method for interpreting qualitative data (Strauss & Corbin, 1997). The constant-comparative method is typically used to develop a grounded theory, which is a theory rooted in the phenomenon or case being studied (Glaser & Strauss, 1967). Characteristics of grounded theory include open-ended analysis and the emergence of

themes and categories, which are drawn directly from the respondents. Open coding was utilized to breakdown and categorize the data into themes. Coding was done by hand, in the margins of the interview transcripts. Themes from the interviews, such as components of market planning, types of connections formed, and recommendations for future seasons, were organized as they emerged. Codes and themes were reviewed by a research assistant to ensure accuracy. In order to validate, the results were shared with the participants (i.e., staff and farmers). The participants agreed upon the results.

Ground Truthing and Review of Documents

Ground truthing is a method and verification process that allows for corroboration of direct observation data with secondary sources of data (Sharkey & Horel, 2008). Field notes were kept by the lead researcher for all planning meetings, including meetings with the CAC and local farmers. The lead researcher took minutes when present, or collected minutes for internal planning meetings from CCPH staff. Recruitment materials including a list of farmers' contacted, copies of emails and/or script used to recruit farmers, and a final list of farmers committed to market were also collected from CCPH staff. Documents such as community brochures and tracking of nutrition education components (i.e. number of children playing the game "Buddy Broccoli") were obtained directly from CCPH staff. Additionally, a copy of the complete marketing strategy was obtained. Marketing and promotion of the market was verified by collecting newspaper articles, television news features, copies of the advertisements, and photographs of advertisements in the community. Another verification method used was a windshield tour, which involved driving through the

community to observe the advertisements and overall setting. The windshield tour is a robust method because it allows the researcher to view contextual data first-hand (Farquhar, Parker, Schulz, & Israel, 2006).

Direct observation was also conducted at the CCPH FM for approximately four hours each week between FM operating hours of 11am-2pm. An observation form (Appendix E) was used to document or note down information such as number of farmers present/absent, produce availability, prices of fresh F & V, weather, and any problems encountered on that market operation day. Photographs at the CCPH FM were taken each week to further document the program and provide additional context.

Field notes, meeting minutes, and other documentation was also shared with staff at CCPH and reviewed for accuracy. Observation field notes were verified by a research assistant in attendance at the market, as well as the market manager or assistant market manager. Like the semi-structured interviews, the constant-comparative method was also used to organize themes from the observation field notes. Open coding was used, and codes were written in the margins of the field notes. Observation field notes were analyzed for market issues, such as early market closure, harsh weather, and problems with farmers and/or customers.

Farmers' market attendance was tracked each week using a metal tally counter. A research assistant stood near the farmers' market entrance and counted as customers arrived at the market. Attendance figures were entered into a spreadsheet at the end of each farmers' market and tracked over the course of the season. Attendance figures were also logged and averaged at the end of the season.

Results

Specific Aim 1: To describe the overall process and resources including stakeholder's involvement and participation of local farmers in planning a farmers' market at a WIC office.

Key Components of Farmers' Market Planning

To initiate the process, some key CCPH staff met regularly and were recognized as a core team in planning the market. Market planning was informed by the previous experience of CCPH in implementing a farmers' market at a local church during the 2012 season. Observation field notes, meeting minutes, and interviews with staff revealed that the main components of the initiative's market planning were: 1) gaining support and buy-in from the state and local officials, 2) forming the community partnership committee, 3) recruiting local farmers and staff support, 4) recruiting and training of the market manager, 5) funding and material support, 6) planning of general logistics, and 7) FMNP coupon issuance procedures.

Gaining Buy-In at the State and Local Level

As a first step, CCPH worked toward gaining support from the state and other local officials, including the county-level Health Director and state-level WIC Director. In planning and implementation of the farmer's market, the State of North Carolina NSB was a lead source of information about the logistics of implementing a food assistance program at the farmers' market. This was important because state-level employees at the NSB work closely with the North Carolina Department of Agriculture and Consumer Services (NCDA & CS), local level WIC directors and staff, farmers'

market managers, and individual farmers/vendors to implement and successfully administer the FMNP program each season. Over a six-month planning phase, several efforts were made to gain a full support from state and local-level management. NSB, along with the local-level Health Director, provided permission to use the parking-lot space at CCPH. Furthermore, an application to become a WIC-approved farmers' market was submitted to the NCDA & CS. Farmers are also key stakeholders in this initiative, and a high-level of support was obtained from farmers selling in the community. Farmers participating in the CCPH FM completed a WIC FMNP Vendor Application that was submitted to the market manager and sent to NCDA & CS for approval.

Staff at CCPH developed guidelines for market operation with guidance from staff at the NSB and NCDA & CS (Appendix F). These guidelines were closely modeled after federal/state FMNP guidelines and other farmers' markets in the area. Notably, these operational rules detailed requirements for produce such as 1) all produce must be grown within the North Carolina borders, and 2) farmers must grow at least 50% of the produce they are selling at the market. The rules stipulated that the remaining 50% could be sourced from other farmers in the area, as long as it was grown in North Carolina.

Establishing Community Partnership

An eight-member CAC was first established to bring together relevant stakeholders focused on the primary goal of improving convenient access to fresh produce in the community. The CAC was also brought together around the more

specific goal of providing convenient farmers' market access to WIC clients and increasing WIC FMNP redemption. Following CBPR principles, stakeholders, such as local farmers, were trained about the benefits of the project and guidelines for WIC FMNP but also provided direct expertise to the research team regarding local farming practices and farmers' market operation. This sharing of resources and knowledge was crucial to planning, implementation, and overall success of the project.

Recruiting Local Farmers

CCPH staff recruited local farmers to participate in the new market location. A local farmers' market manager who had current relationships with farmers in the community provided staff with a contact list and an attempt was made to recruit over 20 farmers selling at other farmers' markets. A total of 12 farmers participated in the market and gained WIC FMNP approval. In addition to their support and buy-in in advocating for use of WIC FMNP coupons, the results indicate that willingness to make changes in their business transactions was important. Only farmers willing to accept FMNP benefits were allowed to sell at the CCPH FM. In initial meetings and contacts, several local farmers expressed that Thursday would be the best market day for farmers because there are few opportunities for farmers to sell their produce on that day. Hence, the market day of Thursday was set up based on farmers' opinions and input from WIC staff.

Recruiting and Training of Market Manager

A health educator at CCPH was chosen to serve as market manager. This manager was selected due to her previous experience on community-based projects at

the health department. It was also noted that this employee had an approachable attitude that would set the tone for the market. The CCPH FM market manager was trained by the NCDA & CS about FMNP federal guidelines during a three-hour face-to-face training in April 2013. The manager provided the bridge between the vendors selling produce and customers, creating a more accessible and convenient space for the transactions to occur. Evidence of farmers' market manager training was obtained in two ways: a) conducting direct observation at the WIC FMNP training (attended by the appointed farmers' market manager from CCPH), and b) receiving a copy of the training and FMNP federal guidelines directly from NCDA & CS.

Funding Support

Startup funding for the market was obtained through an Eat Smart, Move More community grant. Material support, such as wagons, market tents, safety cones, and promotional items, were purchased with this funding, along with various advertisements and marketing components to publicize the CCPH FM and disseminate information in the community.

Planning of General Logistics and FMNP Coupon Issuance Procedures

Market planning was vital and began about six months before the market was expected to open. Mainly, during the planning phase logistics were discussed and finalized under the leadership of the community outreach manager at CCPH and market manager. Examples of planning included consulting with a local attorney and risk management, obtaining an event permit from the county, and completing a fire inspection.

The WIC clinic was responsible for conducting issuance of FMNP coupons to its eligible participants. The current process of FMNP coupon distribution relies on WIC participants coming to the local health department in-person to receive coupons. In line with state and federal guidelines, WIC FMNP benefits valued at total \$24 per participant (6 coupons x \$4) were allocated during a routine WIC appointment to each participant one time only. Participants were issued coupons on a first come, first serve basis though WIC staff encouraged those interested in FMNP coupons to make appointments on Thursdays to further maximize market usage. In addition, one \$4 WIC Bonus Buck incentive was given to each WIC client who was issued FMNP coupons, and that Bonus Buck could only be redeemed at the CCPH FM. This increased the total issuance from \$24 to \$28 per participant. A local business donated the funding to pay for the Bonus Buck program.

Specific Aim 2: To describe key strategies and inputs involved in setting and promoting a farmers' market located at a WIC office specifically targeting its participants.

Key Inputs of Farmers' Market Operation

Field notes, meeting minutes, review of documents, and interviews with staff and farmers revealed that the key inputs of market operation were: 1) market size and produce variety, 2) establishing certain market policies, 3) advertising and promoting the farmers' market, 4) adequate staffing, and 5) activities to engage consumers and build a rapport at the farmers' market.

Market Size and Produce Variety

The market occurred every Thursday from 11-2pm throughout May-October 2013 for a total of 24 markets. This time was chosen because of convenience for both farmers and staff at the WIC clinic who conduct issuance of coupons, along with considerations about seasonal produce variety. The market occurred during the lunch break hour for many nearby employees at the hospital and social services buildings, further optimizing business for farmers. On an average market day, six farmers were present and selling to 181 customers. From May-October, approximately 4,400 customers visited the farmers' market.

Establishment of Market Policies

All of the produce offered at the market was locally grown within the North Carolina borders. As indicated in Figure 3, the market policy required farmers to post prices for all available produce and visibly display the WIC FMNP poster and have a copy of the FMNP flyer at their booth so that WIC participants could identify them.

Figure 3. WIC FMNP Flyer



In line with WIC FMNP guidelines, farmers had to grow no less than 50% of the produce they were offering which gave them the ability to purchase produce from other vendors in the state as needed. Some farmers sought out additional types of produce due to demand from customers. Produce availability varied with the season, and overall more than 50 different F & V including over 10 types of Asian vegetables were offered. Other types of goods such as flowers, honey, jam/jelly, pickles, and eggs were also sold. According to farmers, some of the most popular items were tomatoes, green beans, corn, potatoes, strawberries and/or blackberries, and watermelon. Customers paid with cash, WIC FMNP coupons, Seniors Farmers' Market Nutrition Program coupons, and WIC Bonus Bucks.

Advertising and Promoting the Farmers' Market

Several marketing strategies were developed by staff at CCPH to promote the farmers' market. The strategies consisted of billboards, bus advertisements, road signs, mailed flyers, brochures, TV and radio advertisements, weekly e-mail newsletter, and a ribbon cutting with local government officials and news outlets present (see Appendix G for examples). A coloring contest for children was conducted at the WIC office in the spring in order to create a logo and marketing materials. A winner was chosen and marketing materials were developed that featured the winner. Road signs were placed along major roads near CCPH to inform the public of the farmers' market location and operating hours. Flyers and posters promoting the CCPH FM were disseminated throughout the community, including a direct mail to 10,000 households and 4,000 flyers distributed in local schools. The farmers' market was advertised on CCPH's website and Eat Smart Move More's website. Media coverage was obtained through the local newspapers, the Hickory Daily Record and Observer News Enterprise, and WHKY, the local television and radio news station. In addition, a ribbon cutting took place upon the release of FMNP coupons to mark the official opening of the CCPH FM. Local level decision makers, including county commissioners and CCPH Health Director, were present at the the ribbon cutting. Each Tuesday the farmers were contacted by the market manager and asked for a list of produce they were planning to bring to the market that week. An e-mail newsletter containing this produce list and other market details was then sent to over 500 registered subscribers the following day. Customers were given the opportunity to sign up for the e-mail newsletter at the

information booth each week, and subscribers included CCPH employees, employees at the nearby hospital and Department of Social Services, WIC clients, and community members who visited the farmers' market. The newsletter was fundamental in keeping customers up to date about produce in season, and reminding customers to attend the market each week.

Adequate Staffing

In addition to the manager, adequate staff support was vital to market operation, and there was a high level of motivation among staff to help with the market. Thirty-three staff members at CCPH were recruited for set up operation teams, tear down operation teams, and/or assistant manager roles. The market manager first developed a detailed schedule of staff roles and times. The main administrative volunteer sent reminders to staff on a weekly basis, and found substitutions for staff as needed. The time of the market conflicted with peak times for many clinics inside CCPH, leading to last minute schedule changes for market volunteers. Thursday morning the set-up of tents, safety cones and barricades for the parking lot, and placement of road advertisements occurred at 8am, while another set-up crew at 10am organized the information booth, including positioning of nutrition education materials. Farmers were instructed to arrive no later than 10am, and staff helped farmers unload produce from their vehicles as needed. The market ended at 2pm when farmers began to load their vehicles and a tear down crew arrived to remove materials. As it approached time for the market to close each week, the market manager would stamp FMNP coupons taken by each individual farmer and also pay that farmer cash for any Bonus Bucks.

Activities to Engage Consumers and Build a Rapport at the Farmers' Market

To engage and provide customer service, an information booth was situated near the entrance of the farmers' market. Furthermore, market staff made adequate efforts to educate clients about how to use FMNP coupons. For example, over 40 market tours were given to FMNP clients, and staff was always available at the information booth to provide customer service. WIC clinic staff also conducted follow up phone calls to encourage participants to spend their coupons.

Nutrition education components also helped to further educate clients. In addition, nutrition education materials and produce signs were available in both English and Spanish. In order to specifically engage children, staff at CCPH developed the game Buddy Broccoli. Buddy Broccoli was a cartoon broccoli that was hidden at a different farmers' stand each week. Children participating in the game were asked to find Buddy and were given a small prize (e.g. water bottle, jump rope, or toothbrush) for successfully finding Buddy. This game was played with an average of 20 children per market and allowed them to interact directly with the farmers and staff. Other types of nutrition education included recipe cards, handouts about seasonal produce, brochures about local area farmers' markets, and coloring books. A dietetic intern also conducted tasting demonstrations with various F & V inside the WIC clinic.

Discussion

The process and outcome indicators of this initiative are represented in a logic model (Appendix A). The major short and mid-term outcomes of this initiative were: 1) creation of farmer's market at the convenient location and day; 2) increase

convenient access to fresh produce in the community; 3) increase in shopping of a variety of locally grown produce, 4) increase in the use of FMNP coupons by WIC participants, and 5) increase in revenue for local farmers. Results indicated that close communication using CBPR principles was vital in building a partnership between WIC program staff and farmers to establish the CCPH FM. Interviews with staff and farmers revealed that the market was an overall success and achieved its primary goal of increasing access to fresh produce in the community and improving WIC FMNP coupon redemption.

Of staff and farmers interviewed, 100% indicated willingness or plans to participate in the market again next season. When asked how they would rate the market on a scale of 1 to 10 (1 being a “complete failure”, and 10 being a “total success”) the average score was 9 among the interviewees. The lowest rated score was 7 and the highest score was 10. The project was deemed a success by farmers because the infrastructure for FMNP guaranteed sales and increased profits, the number of customers was satisfactory, market personnel were extremely helpful, and it allowed farmers to meet new people and broaden this client base. Further, results indicated that farmers can be incentivized to participate in farmers’ markets serving low-income neighborhoods by ensuring the market is well-located, has ready access to a large clientele, and has minimal barriers for vendors (e.g. vendor fees, confusing guidelines, and burdensome paperwork). These results are consistent with findings in previous

implementation studies (Markowitz, 2010; Freedman, 2011). Subsidies for F & V, such as FMNP, are critical to both establishing a market infrastructure and making fresh F & V affordable for low-income individuals (Markowitz, 2010).

The primary barrier that kept farmers from participating at the level they would have liked to participate was the weather. The area experienced harsh weather, including flooding, throughout the season, which washed away many crops and/or made it impossible for farmers to harvest crops. This caused a few vendors to stop selling at the market prematurely. Staff thought the project was successful because it improved the image and brand of CCPH, boosted morale among staff, carried out the goals of the Eat Smart Move More Coalition, and allowed them to further connections both within their own agency and with outside organizations. Individual-level benefits among staff also included trying new F & V and improving F & V intake in their own families, while farmers benefited primarily through personal enjoyment and new friendships.

Several recommendations were made by staff and farmers to improve the market in future seasons. Farmers indicated a high willingness to accept SNAP EBT (formerly called food stamps) at the market during the 2014 season since it will give them an additional revenue stream and allow them to further broaden their client base. SNAP EBT will be implemented during the 2014 season as the market has gained SNAP vendor approval from the State and obtained a grant to pay for the EBT wireless technology. The majority of farmers interviewed would like assigned market spaces in order to make it easier for customers to locate them week-to-week though according to

staff this is only possible if farmers arrive on time. Some farmers also expressed disappointment about the quality of some of the produce supplied, and were concerned that some of the produce was obtained out of state or was wholesale—a direct violation of the market operational rules. Others expressed worries about market rules and guidelines not being enforced, and these concerns have prompted staff to review market guidelines and conduct farm site visits as needed to ensure that all produce at the market is North Carolina grown.

Interviews with staff revealed that rotating shift times and changing and/or unclear roles made it difficult to volunteer at the market. Recommendations for next season included set shift times and roles that reoccur throughout the season instead of roles that change each week. It is important for the market manager to be a consistent role, though this person needs an opportunity to take breaks from the hot weather. Accordingly, a more defined role for the assistant manager should be developed. It was noted that essential staff needed to operate the market include four volunteers for the set up team, one market manager, one assistant manager, one volunteer for nutrition education/information booth, and four volunteers for tear down team. Both farmers and staff expressed that more advertising in the local community is needed in order to attract new customers, along with active promotion to WIC clients such as follow up phone calls.

There were also unanticipated benefits of the CCPH FM. It was unanticipated that the market would serve as a tool to promote CCPH and its credibility in the community (i.e. where CCPH is located, and what types of services they offer besides

WIC). Staff also took ownership of the project, which generated pride and excitement amongst employees. The market fostered a wide variety of new connections and relationships. Interviews with staff indicated that partnerships and collaborations with the Catawba Valley Medical Center and Department of Social Services are now more likely due to the market. CCPH is invested in growing partnerships in the community, especially those that increase the amount of nutrition education offered to its clients. For example, a partnership with Cooperative Extension or the Expanded Food and Nutrition Education Program could provide an avenue for cooking demonstrations and cooking classes for WIC participants. A local foods coordinator in the county expressed interest in assisting with future nutrition education projects.

Results indicated that close communication using CBPR principles of promoting co-learning was vital in building a partnership between WIC program staff and farmers to establish the CCPH FM. Sharing of knowledge and expertise was also a key component of new connections and relationships formed. Staff indicated that the market was a great opportunity to contribute knowledge and learn from others, especially farmers. This expansion of knowledge created a greater understanding of needs in the community and the types of future projects CCPH can use to excite and engage the community. Overall, the market allowed CCPH to connect in a new, positive way with their clients in a community-centered environment.

Similar to Freedman's study (2013), which placed a farmers' market at a federally qualified health center, this study used a CBPR approach and included the development of a CAC to guide the implementation of the market. Likewise, the only

other study to locate a farmers' market at a WIC clinic relied on a multi-sectoral community partnership (Concannon, Martin, & Erauth, 2011). Organizing a farmer's market at the WIC office required similar intentions of improving health of the local community among the CAC and WIC staff, and CCPH showed high readiness and enthusiasm to implement a farmers' market.

Larsen and Gilliland (2009) evaluated the impact of opening a farmers' market in London, Ontario. They were specifically interested in whether the market would have an impact on the price and availability of healthy foods in a food desert. The introduction of the farmers' market caused a 12% decrease in prices over a period of three years at the grocery stores in the surrounding neighborhood. Like the present study, this market also increased the variety and accessibility of fresh F & V in an area classified as a food desert. Another study by Evans et al. (2012) introduced two farmers' markets in ethnically diverse, low-income neighborhoods in East Austin, Texas. The purpose of this longitudinal study was to measure if a farmers' market alone would increase F & V intake without any other intervention components such as financial vouchers and advertisements in the community. Like the CCPH FM, these markets accepted SNAP, WIC FMNP, and cash and specifically targeted individuals who lived in a short distance to the market. Similar to the present study, the two farmers' markets occurred on a recurring, weekly basis outside of a local community site and offered a variety of F & V. However, unlike the studies by Evans et al. (2012) and Freedman et al. (2013), the present study is limited by the lack of measurement of F & V intake. Evans et al. (2012) found significant increases in F & V intake post

intervention, especially for whole fruit, tomatoes, and green salad, while Freedman et al. (2013) reported an increase of 1.6 servings among study participants. Freedman et al. (2013) also stressed the importance of using a financial incentive program in order to increase F & V consumption. The present study offered a financial incentive in the form of a Bonus Buck valued at \$4, a figure that is much lower than incentives used in other studies. Evans et al. (2012) were novel in their approach to focus only on market implementation instead of other intervention components such as financial incentives.

Dollahite et al. (2005) identified three major strategies for strengthening WIC farmers' markets: 1) educating clients to use the FMNP, 2) providing markets accessible to the target audience, and 3) improving market quality. The present study provided a market directly accessible to the WIC audience and made efforts to educate clients, including market tours and ample nutrition education materials. Improvements to market quality will be made next season, including the addition of SNAP EBT as a payment method, a shortened season in order to maximize produce variety, more targeted advertisements in the community, and increased efforts to enforce market operational rules and guidelines.

Conclusions and Implications

This project joined public health staff, WIC staff, farmers, and community advocates in addressing a specific problem in the community. This study highlights the importance of leveraging resources at the local or community level to address barriers to FMNP utilization. Locating farmers' markets at WIC clinics, in particular, can reduce barriers for FMNP participants and increase redemption of coupons. Currently,

there is a significant knowledge gap about how to effectively confront barriers among FMNP participants, especially market location and accessibility (Caines, 2004; Holben, 2010; Leone et al., 2012; Markowitz, 2010). This is the first initiative to locate a farmers' market at a WIC clinic parking lot on a recurring, weekly basis. This approach for this study was strong because it eliminated the extra step required to redeem coupons by providing direct access to the farmers' market. In addition, the WIC clinic was able to promote and conduct the majority of weekly FMNP coupon distribution on the days in which the farmers' market was operating, further minimizing the barriers to WIC participants.

This initiative sought to decrease barriers and improve FMNP utilization by addressing market location and convenience in particular. This study helps to fill the knowledge gap concerning best practices to implement farmers' markets at sites such as WIC clinics and other places where social services are accessed. This study provides guidelines for establishing a farmers' market at the health department thereby providing a means of improving FMNP redemption and revenue for farmers. Establishing and locating farmers' markets at other convenient places such as the local health department, could help in connecting farmers and low-income families, and improve the sustainability of markets in low-income neighborhoods.

CHAPTER IV

IMPLEMENTATION OF A WIC CLINIC FARMERS' MARKET IMPROVES ACCESS AND CONVENIENCE TO FRESH FRUITS AND VEGETABLES AMONG WIC FMNP PARTICIPANTS

Abstract

Given that little is known about the effectiveness of locating farmers' markets at locations like WIC clinics and health departments, the purpose of this study was to examine the socio-demographic characteristics and fruit and vegetable (F & V) purchasing behaviors of visitors attending the farmers' market located at the WIC clinic and to examine motivators and enablers for visiting the farmers' market. A customer survey was developed and carried out in partnership with Catawba County Public Health. Surveys ($n = 415$) were collected using a convenience sampling technique. Descriptive frequencies were conducted to describe the socio-demographic profile and to understand farmers' market purchasing behaviors among the study population. Independent t-tests and chi-square were carried out to compare WIC FMNP visitors to non-WIC visitors. The associations were considered significant when the P value was .05 or less. The socio-demographic profile indicated that age range of most (61.8%) of the visitors was 25-54. Among the visitors, the majority was female (90.6%) and non-Hispanic white (74.9%). Overall, the primary enablers and motivators identified among visitors to the farmers' market included variety of the fresh F & V, quality of fresh F & V, and the

ability to purchase food grown locally. WIC FMNP participants were further motivated by low prices and the ability to easily spend FMNP coupons.

Key words: WIC FMNP, farmers' market, survey, motivators, barriers

Introduction

Due to the growing awareness and demand by consumers around the country for local, sustainable agriculture, the number of farmers' markets is on the rise (Brown, 2001; USDA, 2014). The United States Department of Agriculture (USDA) reported a 3.6% increase in farmers' markets from 2012-2013 alone, and there has been a 200% increase over the past 15 years (USDA, 2014). According to the Farmers' Market Coalition, a farmers' market is "organized for the purpose of facilitating personal connections that create mutual benefits for local farmers, shoppers, and communities" (Farmers Market Coalition, 2012). Farmers markets provide an excellent opportunity for farmers to establish relationships with consumers, cultivate loyalty, and to educate customers about local agriculture (Andreatta & Wickliffe, 2002; Corum, Rosenzweig, & Gibson, 2001; Fisher, 1999; Markowitz, 2010). The USDA estimates that farmers receive 19 to 20 cents on the dollar spent at grocery stores, versus the full dollar redemption at a farmers' market (Grace et al., 2008). Moreover, the benefits extend beyond economics when one considers the impact farmers' markets have on promoting sustainability and local agriculture (Markowitz, 2010). Fresh produce at a farmers' market is known to be in season and at the peak of nutrient density as compared to produce sold at grocery stores. This is likely due to a shorter transit time, since nutrient density decreases as time elapses from harvest (Bourn & Prescott, 2002). Surveys with

farmers' market consumers across the United States (U.S.) have cited multiple facilitators to farmers' market usage, most notably the variety of high quality products, the freshness of the fruits and vegetables (F & V), and the ability to support local farmers. However, like access to healthy foods or large grocery stores, farmers' markets are mainly found in middle or high-income neighborhoods. The average farmers' market shopper is female, white, well-educated, and has an above average income (Eastwood, 1999). Low-income Americans, in particular, face the greatest difficulty accessing farmers' markets.

One important program for connecting low-income Americans with fresh F & V is the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Farmers' Market Nutrition Program (FMNP) (Anderson, et al., 2001; Anliker et al., 1992; Conrey et al., 2003; Dollahite, Nelson, Frongillo, & Griffin, 2005; Herman et al., 2008; Kropf et al., 2006). FMNP was established by Congress in 1992, and reauthorized through 2015 as part of the Healthy, Hunger-Free Kids Act of 2010 (Catalog of Federal Domestic Assistance, WIC FMNP," n.d.; WIC FMNP United States Congress House Committee on Agriculture, 1992). The program was created to encourage WIC participants to shop more frequently at farmers' markets with the aim of increasing the consumption of fresh F & V among WIC participants. In 2012, the program supplied fresh produce to more than 1.9 million WIC families, and provided more than \$16.4 million in income for more than 18,000 small farmers (Farmers' Market Coalition, 2013). Research indicates that participation in WIC FMNP is associated with improved access to F & V and a greater likelihood of shopping at farmers' markets (Anliker, et al., 1992; Conrey et al., 2003; Grace et al., 2007; Racine, Smith Vaughn, & Laditka, 2010). The

National Association of Farmers' Market Nutrition Programs evaluated perceptions about WIC FMNP among participants ($n = 24,800$) and farmers ($n = 2,561$) in 2002. Findings indicated that 42% of program participants had never previously been to a farmers' market, 54% spent money at the market in addition to coupons, and 73% planned to continue shopping at farmers' markets once their coupons were gone (National Association of Farmers' Market Nutrition Programs, 2001). Another survey of WIC FMNP participants revealed that 58.2% thought the quality at the farmers' market was better than at the grocery store. In terms of payment at the farmers' market, 51% percent said they spent their own cash, 11.7% used SNAP and 10.7% used both, in addition to FMNP coupons (Joy et al., 2001).

Despite the positive benefits of the FMNP program, redemption rates of coupons remain low. Few studies have examined existing barriers to farmers' market utilization among the WIC population or addressed low redemption rates (Conrey et al., 2003; Racine et al., 2010; Schneider, McDonnell, & Neyman Morris, 2012). The results of these studies have shown that the distance to farmers' market has been a major barrier for WIC participants (Joy et al., 2001; Racine et al., 2010). At one North Carolina farmers' market, surveys revealed that 86% of customers traveled 6 or more miles, and 15% traveled over 20 miles to reach the market (Andreatta & Wickliffe, 2002). In addition to distance, the research on access to farmers' markets has shown that WIC participants experience multiple barriers, such as no or poor transportation, lack of time, and insufficient access and availability of farmers' market locations, consequently preventing them from redeeming FMNP coupons (Caines & Harvest, 2004; Joy et al., 2001).

With the current obstacles that prevail, one promising strategy to address barriers to FMNP utilization is the setting up farmers' markets in convenient locations such as WIC clinic parking lots (Concannon, Martin, & Erauth, 2011). The present study planned and implemented a new farmers' market, the Catawba County Public Health Farmers' Market (CCPH FM) at the local WIC office in Catawba County, North Carolina, of which WIC FMNP participants were the main target audience. The purpose of this farmers' market was to provide convenience and improve access to locally grown fresh F & V in the community and to increase the FMNP coupon redemption rate. The market occurred Thursdays from May-October 2013 for a total of 24 weeks. Overall, twelve WIC-approved farmers sold at the market, and offered a variety of locally-grown produce.

Given that little is known about the effectiveness of locating farmers' markets at locations like WIC clinics and health departments, the specific aims of this study are 1) to assess socio-demographic characteristics such as age, ethnicity and area of living of WIC and non-WIC visitors attending the farmers' market located at the WIC clinic, 2) to examine motivators and enablers for visiting the farmers' market located at the WIC clinic, and 3) to examine the F & V purchasing behaviors in terms of the total amount spent and variety of F & V purchased by WIC participants attending the farmers' market located at the WIC clinic. The hypotheses were that WIC FMNP participants who shop at the new WIC clinic farmers' market would: 1) purchase a variety of fresh

F & V, 2) shop at the market more than one time during the season, 3) spend their coupons at the CCPH FM versus other markets in the county, and 4) indicate that the new market location made it easier for them to spend their FMNP coupons.

Methodology

Farmers' Market Survey Development

In order to meet the study objectives, individual surveys were carried out with the farmers' market visitors. The survey was designed and implemented in partnership with CCPH. Initially, the survey was developed through an iterative and participatory process with staff at CCPH. The survey (Appendices H & I) was based on the previous surveys used by the Catawba County WIC office, the State of North Carolina Nutrition Services Branch, and a farmers' market survey from a nearby county. The survey was developed in both English (Appendix H) and Spanish (Appendix I). The Spanish survey was translated by a community health worker at CCPH, and verified by a second community health worker. The UNC Greensboro Institutional Review Board approved the final English and Spanish surveys along with data collection methods.

Key sections of the survey were: 1) socio-demographic information such as age, ethnicity, and zip code; 2) what drew visitors to the market (i.e. advertisements, quality and variety of produce, convenience, and support of local farmers); 3) shopping behaviors including payment method, amount of money spent, and variety of produce purchased; and 4) perceived benefits of the CCPH FM and suggestions for improvement. In addition, at the end of the survey, a section was included specifically for WIC FMNP participants. Under this section, questions were asked to collect

information on the convenience of the farmers' market location, use of FMNP coupons, and ways in which the market may have helped them spend their FMNP coupons. In this two-page survey, there were sixteen close-ended questions and six open-ended questions. For example, one open-ended question asked visitors to write the number of times they had been to the CCPH FM. Surveys were collected each Thursday from July 11 to October 3, 2013, for a total of thirteen weeks. This time period reflects when WIC FMNP coupons were available in the county.

Sampling and Data Collection

An information table near the entrance of the market served as a dedicated space for survey distribution. Surveys were administered in-person using a convenience sampling technique. Visitors were asked to complete a survey as they passed the information table or as they exited the farmers' market. However, some visitors were approached directly by the research team as they shopped at the farmers' market, and asked to complete a survey once they finished shopping. A total of 415 surveys were collected over the course of 13 weeks. Specifically, to ensure that 25% of the total sample was WIC clients, surveys were administered on a weekly basis when WIC FMNP coupons were available in the county, and up to 50 surveys were collected on those market days. Overall, the only selection criteria employed for the survey was that individuals must be 18 years of age or older, a visitor to the farmers' market, and had not previously completed a survey at the market. Upon indicating interest, participants were provided a survey to fill out and in the end a farmers' market tote bag was given as an incentive. Furthermore, each survey respondent was entered into a drawing for a

chance to win \$250.00 in free groceries from Food Lion. Those wishing to enter the drawing were asked to provide their first name only and a telephone or e-mail address where they could be reached. The winner of the drawing was selected during the last farmers' market, and contacted directly by the lead researcher. The surveys and information for the drawing were kept in a secure location near the information booth, and then stored and transported securely to UNC Greensboro after each market.

Data Analysis

Survey responses were coded with numeric values (e.g. yes=1; no=2) before being entered into Microsoft Excel. To ensure accuracy of data entry, data was first entered by one member of the research team and then verified independently by two other members. All of the data was analyzed using Microsoft Excel, Vassar Stats, and IBM SPSS version 19.0 software. Descriptive frequencies were conducted to describe the socio-demographic profile and to understand farmers' market purchasing behaviors among the study population. In addition, frequencies were run to analyze the WIC FMNP participation rate. Independent t-tests and chi-square were carried out to compare WIC FMNP visitors to non-WIC visitors. The associations were considered significant when the *P* value was .05 or less. For the purposes of the chi-square analyses, some of the categories were collapsed. For example, since only a few respondents were age 65 and older, this age category was combined with those 55 and older.

Results

Socio-Demographic Characteristics of Farmers' Market Visitors

Of the total survey ($n = 415$) participants, 29.9% ($n = 124$) reported receiving WIC FMNP. The socio-demographic profile indicated that age range of the most (61.8%) of the visitors was 25-54. Among the visitors, the majority was female (90.6%) and non-Hispanic white (74.9%). In comparison between WIC and non-WIC visitors, as indicated in Figure 4, the majority of WIC visitors were between the ages of 18-34 while the majority of non-WIC visitors were older than 34 years. Age was significantly different between WIC visitors and non-WIC visitors $X^2(4, n = 398) = 139.05, p < 0.0001$, as well as ethnicity $X^2(3, n = 398) = 13.7, p = 0.0033$ (Figure 5). The age categories compared were 18-24, 25-34, 35-44, 45-54, and 55 and older. The ethnicity categories compared were White, Black, Hispanic, and "Other" which was collapsed to include the Asian group.

Figure 4. Ages of WIC and non-WIC Visitors

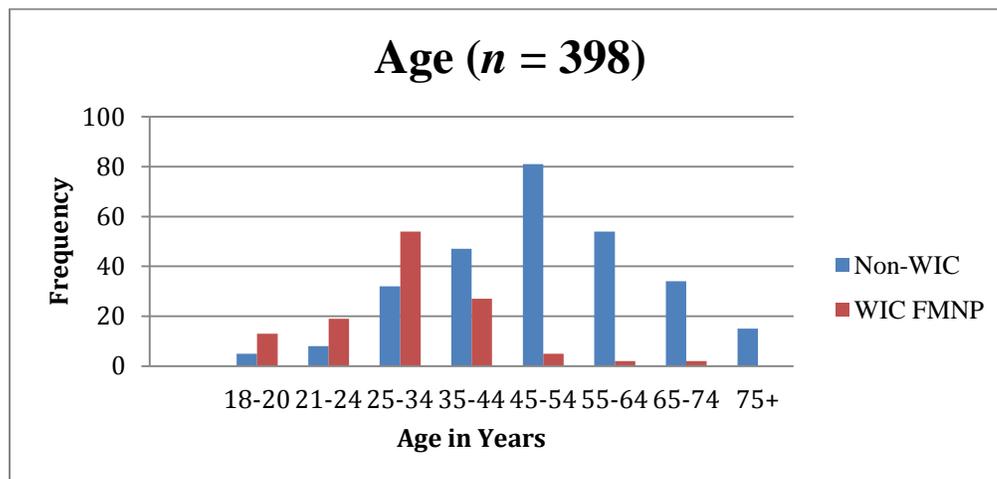
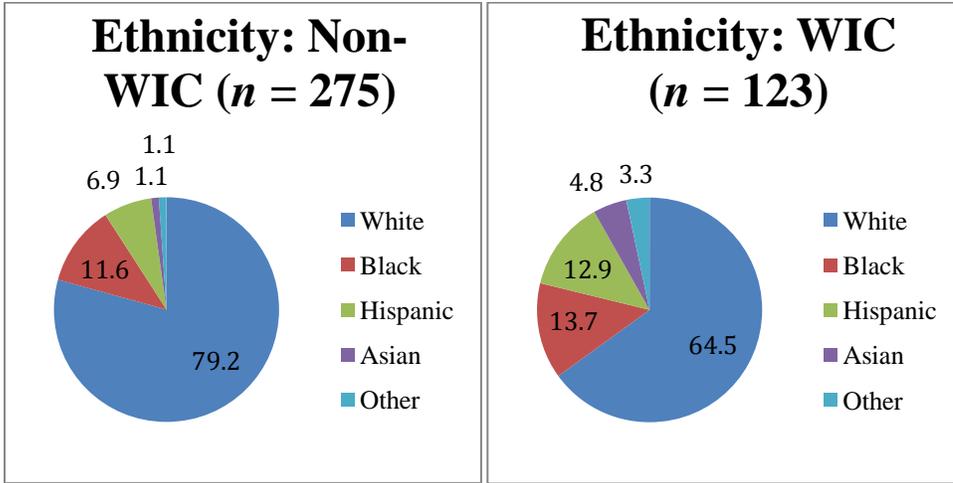
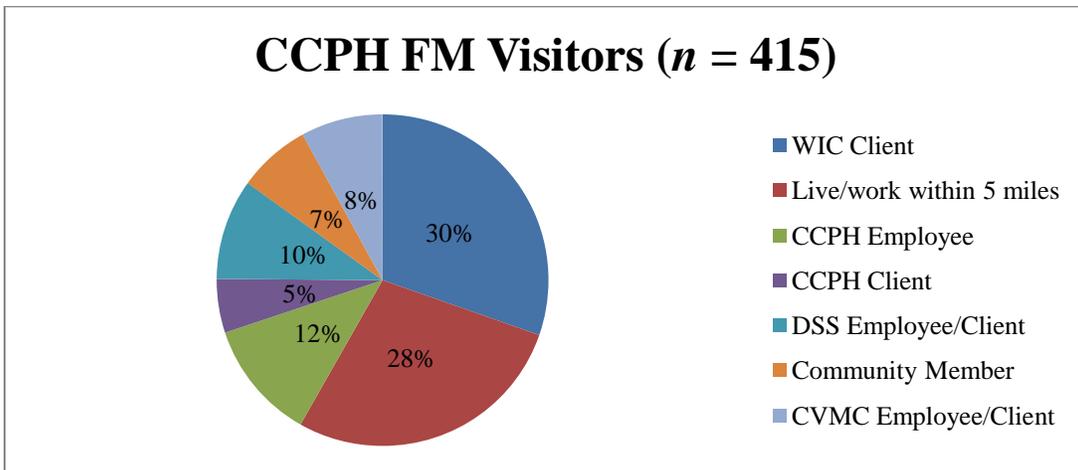


Figure 5. Ethnicity of WIC and non-WIC Visitors



As shown in Figure 6, the majority of visitors were either WIC clients (32.1%) or community members who lived or worked within five miles of CCPH (29.4%). The remaining one third of the visitors described themselves as general community members and clients or employees of: CCPH, Department of Social Services (DSS), or the Catawba Valley Medical Center (i.e. the local hospital).

Figure 6. Breakdown of CCPH FM Visitors



Furthermore, the majority of survey respondents indicated that they lived in the Catawba County area. Based on zip codes provided by respondents, 37% lived in Hickory, 19.3% in Newton, and 15.2% in Conover. The remaining respondents lived in more rural areas of Catawba County, such as Claremont, or in the surrounding counties of Burke, Iredell, and Lincoln.

What Drew Shoppers to the Farmers' Market: Motivators and Enablers

Approximately 60% of survey respondents ($n = 207$) were first time visitors to the CCPH FM. Of those who had previously visited the FM, the highest number of times visited was 20 for non-WIC and 10 for WIC FMNP. Overall, the average visitor came to the market 2.4 times. An independent sample t-test was carried out to compare the mean number of times WIC FMNP and non-WIC visitors came to the CCPH FM. There was a significant difference in the number of times non-WIC visitors ($M = 2.81, 95\% CI \pm 0.39$) came to the market versus WIC FMNP visitors ($M = 1.59, 95\% CI \pm 0.26$); $t(339) = 3.92, p < 0.0001$.

Visitors learned about the market mainly from the WIC clinic (35.4%) and advertisements in the community (55.7%). These advertisements included road signs near the market, bus advertisements, flyers, brochures, and billboards. The most frequently selected advertisement was road signs (29.6%). Another 25% heard via word of mouth from friends and family. Shoppers were also asked why they wanted to come to the farmers' market, and multiple responses were accepted. As outlined in Table 2, the main motivators or enablers for coming to the farmers' market were variety of fresh F & V, the ability to purchase food grown locally, the quality of the fresh F & V, and to

support local farmers. However, among the WIC FMNP visitors low prices and the ability to easily spend WIC FMNP were more of a motivation than to support local farmers.

Table 2. What Makes You Want to Come to This Farmers' Market?

| What makes you want to come to the farmers' market? | Non-WIC <i>n</i> = 291 | | WIC FMNP <i>n</i> = 124 | | Total <i>n</i> = 415 | |
|---|---------------------------|------|----------------------------|------|-------------------------|------|
| | <i>n</i> | % | <i>n</i> | % | <i>n</i> | % |
| Variety of fresh F & V | 218 | 74.9 | 96 | 77.4 | 314 | 75.6 |
| Purchase food grown locally | 180 | 61.9 | 63 | 50.8 | 243 | 58.6 |
| Quality of fresh F & V | 167 | 57.4 | 59 | 47.6 | 226 | 54.5 |
| Support local farmers | 131 | 45.0 | 43 | 34.7 | 174 | 41.9 |
| Low Prices | 112 | 38.5 | 55 | 44.4 | 167 | 40.2 |
| Convenience | 109 | 37.5 | 39 | 31.5 | 148 | 35.7 |
| Taste of fresh F & V | 102 | 35.1 | 39 | 31.5 | 141 | 34.0 |
| Easy to use WIC FMNP or SFMNP | 11 | 3.8 | 69 | 55.6 | 80 | 18.1 |
| Socialize with people from my community | 24 | 8.3 | 9 | 7.3 | 33 | 8.0 |

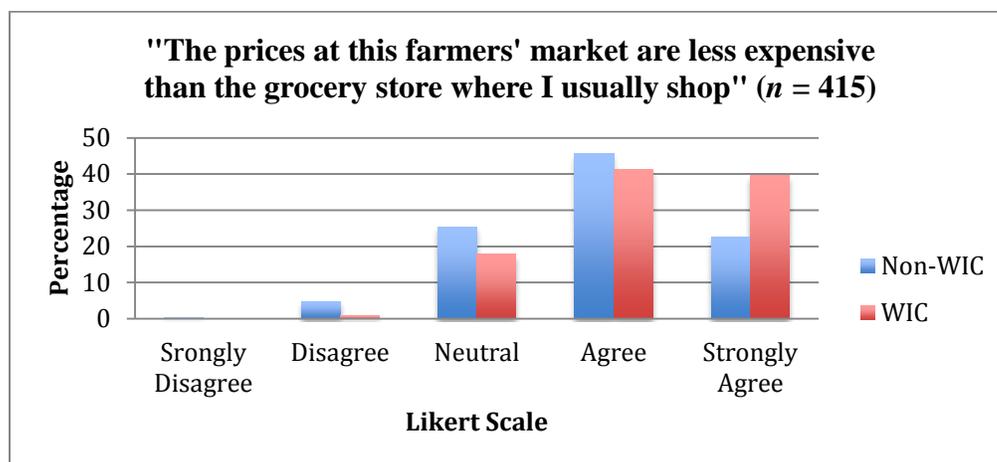
Farmers' Market Shopping Behaviors

Visitors used a variety of payment methods, of which cash (73.7%) was the most frequent method. However, WIC FMNP visitors spent mostly WIC FMNP coupons (79%) and Bonus Bucks (48.4%), though they also spent cash in addition to coupons

(24.2%). The average amount spent in one day at the market was \$10; the highest amount spent was \$40 and the lowest was \$1. Independent samples t-test was carried out to compare the mean amount spent between WIC FMNP and non-WIC visitors. There was a significant difference in the amount of money spent by non-WIC visitors as compared to WIC FMNP visitors. WIC FMNP visitors (M = 16.67, 95% CI ± 1.60) spent more money (including cash + FMNP coupons) than non-WIC visitors (M = 13.39, 95% CI ± 0.92); $t(452) = -3.51, p = 0.0002$. As shown in Table 2, WIC visitors wanted to come to the market because it was “easy to use FMNP coupons” and this may have contributed to their spending.

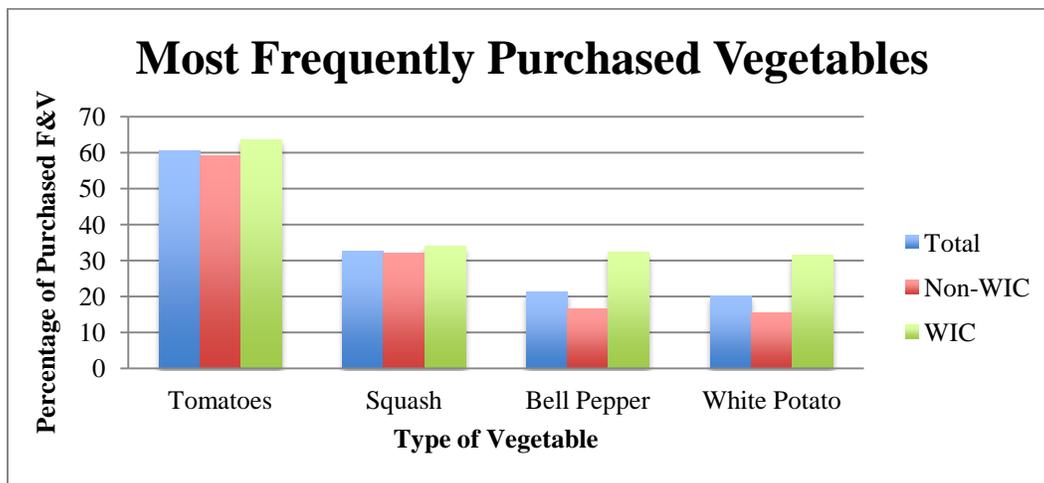
Shoppers were presented with the statement “The prices at this farmers’ market are less expensive than the grocery store where I usually shop” on a 5-point Likert Scale. As shown in Figure 7, the majority of visitors agreed or strongly agreed with the statement, with WIC FMNP visitors selecting “strongly agree” (39.5%) at a higher rate than non-WIC visitors (22.7%).

Figure 7. Prices at the Farmers’ Market



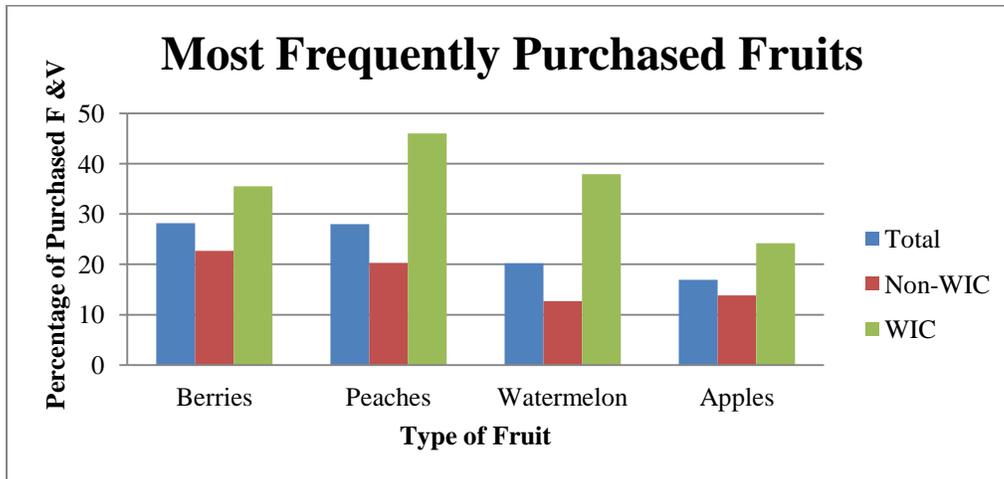
Shoppers were also asked to indicate which F & V they had purchased on that market day, and multiple responses were accepted. The most frequently purchased item was tomatoes i.e., 60.5% of shoppers indicated they had purchased tomatoes. Other frequently purchased vegetables appear in Figure 8.

Figure 8. Most Frequently Purchased Vegetables



Other less frequently purchased vegetables included corn, sweet potatoes, green beans, hot peppers, and okra. As shown in Figure 9, the most frequently purchased fruit was berries, a grouping which included strawberries, blueberries, and blackberries, closely followed by peaches.

Figure 9. Most Frequently Purchased Fruits



Additional fruits were also available, including muscadine grapes, scuppernong grapes, concord grapes, cantaloupe, and figs. Visitors were also asked if there were any F & V they would have liked to purchase at the market but were not available on that day. The majority of the suggestions were seasonally grown F & V with a limited window of availability including strawberries, corn, and okra. Regarding F & V consumption, a general statement “this farmers’ market helps me to increase the amount of fresh fruits and vegetables my family eats” was also rated on a 5-point Likert Scale. More than 88% of shoppers agreed with the statement, and of those 44% strongly agreed.

WIC FMNP Visitors

Approximately 60% of WIC FMNP participants were visiting the CCPH FM for the first time, and on average, FMNP participants visited the market 1.6 times.

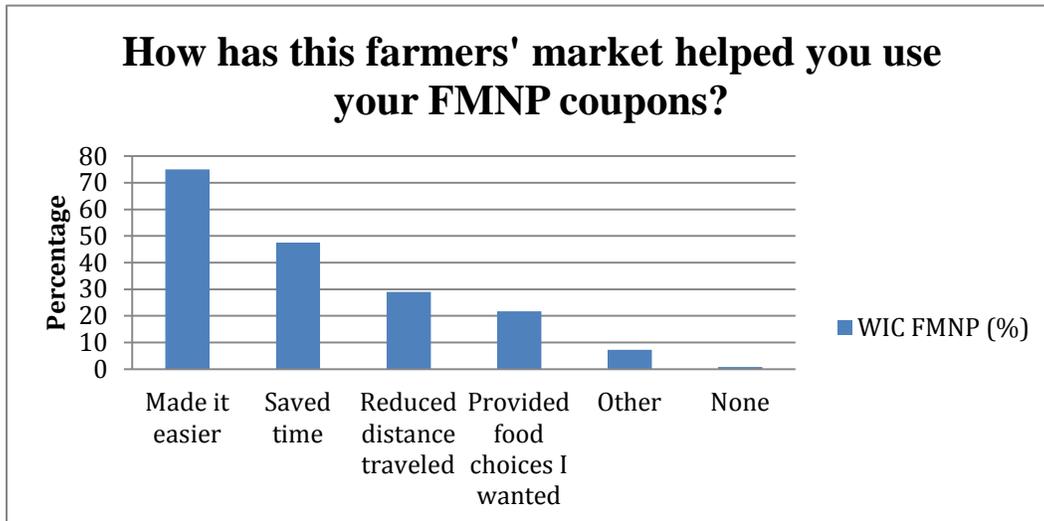
However, some FMNP participants visited the market up to 10 times. The majority (65%) of FMNP participants were shopping and spending their coupons for the first

time. Including those spending for the first time, the bulk (81%) spent their FMNP coupons at the CCPH FM, while others spent at the Downtown Hickory Farmers' Market (14%) or Conover Farmers' Market (13%). Only 18.5% noted that they received a phone call from the WIC clinic to remind them to spend their coupons.

As shown in Table 2, variety was the main motivator for WIC FMNP participants to come to the farmers' market. WIC FMNP participants purchased over twenty different types of F & V. As indicated in Figures 8 and 9, the most frequently purchased produce item was tomatoes, and 63.7% of FMNP visitors indicated that they had purchased tomatoes at the market that day. The next most popular items were peaches (48%), watermelon (38%), and berries (35.5%). The WIC FMNP visitors also requested that additional fruits be made available at the market. However, these suggestions were mostly fruits that have a short growing season in North Carolina, such as strawberries and grapes, and were available at the market for a limited amount of time. Other suggestions for fruits were those not grown in the region such as bananas and mangoes.

In general, WIC FMNP participants also thought that the new market location was convenient (31.5%) and made it easier for them to spend FMNP coupons (54%). This is reflected in Figure 10, which shows FMNP participants' responses to how the new farmers' market location at the WIC clinic helped them spend their coupons. Most (75%) indicated that the CCPH FM "made it easier" to redeem their coupons. Another 48% thought that the market location saved time, while 29% noted that it reduced their distance traveled.

Figure 10. WIC FMNP Participant Responses to Location of Farmers' Market



Furthermore, WIC FMNP participants indicated that the additional \$4 Bonus Buck incentive helped them to buy extra produce (63.7%), come to the CCPH FM for the first time (36.3%), and try a new fruit or vegetable (21%).

Conclusions and Implications

The results indicate that locating a farmers' market at the clinic helped WIC FMNP visitors in using coupons and improving intake of the variety of F & V. The hypothesis that FMNP participants would indicate that the new market location made it easier for them to spend their FMNP coupons was supported. The primary motivators among WIC FMNP visitors was the variety of fresh F & V, followed by the ability to easily spend WIC FMNP coupons. Overall, the quality of fresh F & V drew more visitors to the market than the prices of fresh F & V. These results support findings from multiple studies, including a case study conducted in Guilford County, North Carolina. Specifically, this study supports the findings that facilitators to market usage

include the opportunity to buy produce in season, purchase high quality F & V, and to support local farmers (Andreatta & Wickliffe, 2002; Evans et al., 2012; Freedman, Bell, & Collins, 2011).

This study also supports previous research indicating that WIC FMNP participants who shop at the farmers' market will spend their own cash in addition to coupons (National Association of Farmers' Market Nutrition Programs, 2001; Joy et al., 2011). Moreover, some WIC FMNP participants in this study also continued shopping at the farmers' market once their coupons were gone, and the hypothesis that FMNP participants would shop at the market more than one time during the season was generally supported. Furthermore, the hypothesis that FMNP participants would spend their FMNP coupons at the new market location versus other market locations was also supported, as more coupons were redeemed at the CCPH FM than other markets in the county. Sales data for FMNP coupons was tracked, and revealed that 48.1% of the total FMNP coupons issued in the county were spent at the CCPH (Ball et al., 2014). These results indicate that the new market location improved convenient access to farmers' markets among WIC FMNP participants.

Consistent with other studies at farmers' markets, low prices at the farmers' market were also a facilitator for shoppers (Larsen & Gilliland, 2009; McGuirt, Jilcott, Haiyong Liu, & Ammerman, 2011). Over 40% of shoppers noted that they wanted to come to the market because of low prices of fresh F & V. Furthermore, they perceived the prices at the farmers' market to be less expensive than the grocery store, though WIC FMNP visitors agreed at a higher rate than non-WIC visitors (80%). In fact, an

analysis of prices for F & V at farmers' markets and supermarkets in twelve North Carolina counties revealed a cost savings of over 17% for produce at farmers' markets (McGuirt et al., 2011). These findings illustrate how increasing access to farmers' markets can be a promising solution to reducing the cost of fresh F & V for low-income groups. The finding that cost is an important influence on food consumption for those with lower incomes (Glanz, et al., 1998) suggests that programs aimed at increasing F & V consumption among low-income Americans should address both the actual and perceived price of F & V.

Several visitors made the suggestion to include SNAP EBT as an accepted form of payment, particularly as some visitors to the market were DSS/SNAP clients. It is important to better accommodate those visitors going forward and SNAP EBT will be available as a payment method at the CCPH FM beginning in summer 2015. This change in business practices will also benefit farmers by allowing them to expand their client base and increase revenue (Holben, 2010). As suggested by Markowitz (2010) and Conrey (2003) it will also be key to conduct outreach to both the WIC and SNAP populations, and disseminate more information in the community about farmers' market hours and accepted forms of payment.

This study highlights the willingness and motivations of low-income Americans to shop at farmers' markets. The results of this study indicate that efforts are needed to improve convenience and physical access to the farmers' market in order for the FMNP program to be successful. However, there remains a significant knowledge gap about how to effectively confront these barriers, especially market location. New and

innovative strategies are needed to address these barriers and raise WIC FMNP coupon redemption rates. This study provides new knowledge about how minimizing barriers to farmers' markets can help WIC clients spend their FMNP coupons. This is key since utilization of FMNP coupons is associated with increased F & V intake (Anderson JV et al., 2001; Joy et al., 2001).

Lastly, there is a great need for nutrition education efforts focusing on local agriculture and farmers' markets. Results from this study indicate that these efforts should include more information about seasonal produce and peak times of availability as many visitors wished to purchase items that were not grown in North Carolina, or were unavailable due to seasonality. Additionally, cooking demonstrations at farmers' markets could help mitigate barriers to cooking fresh F & V and could be accompanied by taste tests within the WIC clinic. This could be accomplished through partnerships with Cooperative Extension and the Expanded Food and Nutrition Education Program. In the long term, it is important to improve cooking literacy among the WIC population, particularly as it relates to selection and preparation of fresh vegetables.

CHAPTER V

A FARMERS' MARKET LOCATED AT THE WIC CLINIC INCREASES FMNP COUPON REDEMPTION IN CATAWBA COUNTY, NORTH CAROLINA

Abstract

The present study tested if locating a farmers' market at a local health department WIC clinic increased redemption of FMNP coupons by improving convenience and physical access to the farmers' market in Catawba County, North Carolina. The primary outcome measure was FMNP coupon redemption rate, as measured by county-level redemption rate. Redemption data was analyzed using the pre-post comparison method, case control method, and by comparing Catawba County's past and current redemption ranking to other counties in the state. Rates from 2007-2013 were averaged and compared using a weighted ranking system (% redemption * % eligible individuals). The 2013 redemption rate increased from 51.3% to 62.9%. Specifically, results from this study can aid other local health departments and WIC clinics in implementing similar F & V promotion programs thereby reducing barriers, improving FMNP redemption rate, and increasing F & V intake among the WIC population in general.

Key words: WIC FMNP, redemption, farmers' market, food access, barriers

Introduction

Efforts have been made to address economic barriers to accessing fresh fruits and vegetables (F & V) through financial voucher programs that connect low-income

Americans with farmers' markets. These programs include the Seniors Farmers' Market Nutrition Program (SFMNP) for low-income senior citizens and the Special Supplemental Program for Women, Infants, and Children (WIC), which have offered seasonal incentives to visit farmers' markets for the last twenty years. In 2009 the Centers for Disease Control and Prevention (CDC) called for an increase in the number of farmers' markets, and the percentage of farmers' markets that accept Supplemental Nutrition Assistance Program (SNAP) electronic benefits transfer (EBT) and WIC Farmers' Market Nutrition Program (FMNP) coupons (Goodman, 2009). The WIC FMNP was established by Congress in 1992, and reauthorized through 2015 as part of the Healthy, Hunger-Free Kids Act of 2010 (Catalog of Federal Domestic Assistance: WIC FMNP," n.d.; WIC FMNP: United States Congress House Committee on Agriculture, 1992). The program was created to encourage WIC participants to shop more frequently at farmers' markets with the aim of increasing the consumption of fresh F & V among WIC participants. Research indicates that participation in WIC FMNP is associated with improved access to F & V, increased consumption of fresh F & V, and a greater likelihood of shopping at farmers' markets (Anliker, Winne, & Drake, 1992; Conrey et al., 2003; Grace et al., 2007; Racine, Smith Vaughn, & Laditka, 2010). Despite these important outcomes, redemption rates of FMNP coupons remain low across the U.S. (Conrey et al., 2003; National Association of Farmers' Market Nutrition Programs, 2001).

In order to qualify for FMNP benefits, you must be a WIC participant who is currently pregnant, breastfeeding, or postpartum, or an eligible child between the ages

of 3-5 years (“10.572 - WIC Farmers’ Market Nutrition Program (FMNP) - CFDA: Programs,” n.d.). The minimum federal benefit per participant is \$10 while the maximum benefit is \$30. Thus, the actual benefit amounts vary per state. For example, North Carolina allocates \$24 per individual (6 coupons x \$4 each). On average, the program benefit across the U.S. is \$19 per individual. Federal guidelines dictate that the benefit is only allocated one time per season per participant. In 2012, the program supplied fresh produce to more than 1.9 million WIC families, providing more than \$16.4 million in income for more than 18,000 small farmers (Farmers' Market Coalition, 2013).

Another goal of the program is to revitalize rural areas by keeping the farmers’ share of the food dollar local (WIC FMNP: United States Congress House Committee on Agriculture, 1992). The program has been successful at stimulating business for local farmers and creating greater awareness of farmers’ markets in local communities. Over 4,000 farmers’ markets in the U.S. accept WIC FMNP coupons and roughly 65 of those markets are in North Carolina (“NCDA&CS - Agricultural Statistics Division,” 2012; “USDA Directory,” 2014). Several studies have documented the positive impacts of FMNP on farmers (Andreatta & Wickliffe, 2002; Henry et al., 2003; Just & Weninger, 1997). Farmers directly benefit from the program since they receive the full face value of each FMNP coupon redeemed by participants. An economic evaluation of WIC FMNP using data from six states found that farmers gained 7-9% more than the check redemption via additional purchases (Just & Weninger, 1997). Furthermore, research shows that the majority of farmers are satisfied with the FMNP program since

it contributes money to the local economy and allows farmers to broaden their client base (Andreatta & Wickliffe, 2002; Holben, 2010; National Association of Farmers' Market Nutrition Programs, 2001). In fact, at farmers' markets in low-income areas, sales to WIC and SNAP clients account for the majority of total sales (Henry et al., 2003; National Association of Farmers' Market Nutrition Programs, 2001; Farmers Market Coalition, 2013). The National Association of Farmers' Market Nutrition Programs evaluated perceptions about WIC FMNP among participants ($n = 24,800$) and farmers ($n = 2,561$) in 2002. Nearly all responding farmers (90%) reported that participating in the FMNP increased their farmers' market sales (National Association of Farmers' Market Nutrition Programs, 2001).

Despite generating benefits for farmers and communities, the WIC FMNP program is constantly at risk of budget cuts. The federal appropriation for the program is \$20 million, in addition to state matching requirement of 30% for administrative costs only (Catalog of Federal Domestic Assistance: WIC FMNP," n.d.). According to the Federal Register, matching requirement means "state, local or private funds, or program income, equal to not less than 30 percent of the administrative FMNP cost for the fiscal year." The program was reduced to \$16.8 million in federal funds in 2012, and was further cut to \$15.3 million in 2013, a figure 24% lower than the appropriation established under the Healthy, Hunger-Free Kids Act (Farmers' Market Coalition, 2013).

One reason for budget cuts is the low level of coupon redemption, a measure of program utilization that reflects the number of coupons redeemed by WIC participants,

deposited by farmers, and processed through a central banking system. Redemption rates of FMNP coupons provide information about the number of WIC families that might be benefiting from the program (Conrey et al., 2003; Herman et al., 2008). As such, exploration of redemption rates can offer insights regarding the extent to which WIC participants visit farmers' markets to purchase fresh F & V. Typically, redemption rates for FMNP are much lower than that of the SFMNP, a similar program that supplies fresh produce to low-income seniors. The nationwide average redemption rate for FMNP from 1994-2006 was only 59% (Federal Register Interim Final Rule, 2008), compared to an average of 87% for SFMNP (National Association of Farmers' Market Nutrition Programs, 2011). A nationwide survey of participating states and tribal organizations by the National Association of Farmers' Market Nutrition Programs in 2011 revealed that 52% of participating agencies reported a redemption rate between 50-75%, while 35% of participating agencies reported a lower redemption rate between 28-49%. Moreover, only 7% of participating agencies reported the highest rates, between 76-100% (National Association of Farmers' Market Nutrition Programs, 2011). The aggregate redemption rate statewide in North Carolina for the 2012 WIC FMNP season was only 47% (NSB, personal communication, April 2013), a figure lower than the national average, further illustrating the need for effective solutions to increase coupon redemption.

Research has documented that WIC participants face multiple barriers, such as lack of transportation and limited operation hours of local farmers' markets, which prevent them from redeeming FMNP coupons (Joy et al., 2001; Caines, 2004). Caines

(2004) found that the main barriers among FMNP participants in Pennsylvania were lack of inconvenient market hours (lack of time), market location that was too difficult or distant to reach, and lack of transportation. A majority of respondents indicated they would shop at the farmers' market if a shuttle service were available (Caines & Harvest, 2004).

Meanwhile, only one WIC FMNP study has directly investigated coupon redemption rates. Conrey et al. (2003) found that a coordinated effort of four different program components increased FMNP coupon redemption rates in New York State, one of the largest beneficiaries of the FMNP program. These program enhancements included hiring a statewide FMNP coordinator, increased collaboration among state and local agencies, local-level community capacity building (i.e. identifying and leveraging key stakeholders), and distribution of new nutrition education resources. Redemption rates from 1996-2000 were analyzed using linear regression, revealing that redemption decreased by an average of 2.36% each year ($p = 0.002$, $n = 5$) before the program enhancements. The post intervention rate of 59.7% was higher than the predicted redemption rate of 57.43%. The 2001 rate of 59.7% reflected an increase of up to \$316,000 for F & V purchases by WIC families (Conrey et al., 2003). The authors concluded that program enhancements at state and local levels are effective in increasing coupon redemption, and in turn, revenue for local farmers.

The present study tested if locating a farmers' market at a local health department WIC clinic increased redemption of FMNP coupons by improving convenience and physical access to the farmers' market. In previous client surveys,

WIC participants in Catawba County, North Carolina indicated that long distance, lack of transportation, and limited hours of farmers' market operation made it difficult for them to spend their coupons. A new farmers' market, the Catawba County Public Health Farmers' Market (CCPH FM), was planned and located at the WIC office in Catawba County, North Carolina. Local farmers, program administrators, and community advocates worked together to plan and implement the CCPH FM. Overall, the CCPH FM represents community partnership among state and local level WIC, Eat Smart Move More, local farmers, and UNC Greensboro. The CCPH FM occurred on Thursdays from May-October 2013 for a total of 24 weeks. Overall, twelve WIC approved farmers sold at the market, and offered a variety of locally grown produce. The specific aims of this study were to examine: 1) the effectiveness of locating and improving access to the farmers' market at the WIC office in the use of WIC FMNP coupons in Catawba County using pre-post comparison method, 2) the effectiveness of locating and improving access to the farmers' market at the WIC office in use of WIC FMNP coupons in Catawba County by comparing its past and current redemption ranking to other counties in the state, and 3) the effectiveness of improved access to farmers' market in Catawba County in the use of WIC FMNP coupons using case-control method. The hypotheses were that the FMNP redemption rate in Catawba County would be significantly higher in 2013 than in previous seasons (2007 -2012), and that the redemption rate for 2013 in Catawba County would be significantly higher than the redemption rate in the control county of Cabarrus since the latter did not have an on-site farmers' market.

Methodology

Study Setting and Design

The CCPH WIC clinic parking lot served as the location for the farmers market. CCPH's WIC program serves over 4,000 participants monthly and these participants were the main target audience for the CCPH FM (NC Nutrition Services Branch, personal communication, 2014). A case study design was used to examine redemption rates for the 2013 WIC FMNP season. The outcome measure for this study was redemption rates of FMNP coupons, as measured by county-level redemption rates.

Data Collection

FMNP distribution process in North Carolina.

FMNP coupons are issued to WIC participants at the local WIC office during the summer month period from May 1 through September 30, on a rolling basis as coupons become available from the state. The issuance period for FMNP coupons varies by county based on peak produce times and availability of funding. For example, in Catawba County during the 2013 season, the issuance period was July 7-September 30. During these months, in total 6 coupons valued at \$4 each were issued to each eligible WIC participant and qualifying child between the ages of 3-5. Coupons can be redeemed at participating farmers' markets in the area. Individual farmers who have gained WIC FMNP approval from the state accept coupons and display a WIC FMNP poster in order for participants to identify them. For redemption, both the market

manager and the farmer stamps each redeemed coupon before it is deposited into the bank. Coupons are then processed through the state WIC banking system and farmers received the full face value of each coupon deposited (\$4 each).

Redemption data collection.

A report of redemption data from 2007-2013 was obtained directly from the State of North Carolina Nutrition Services Branch (NSB) at the state-level. Years 2007-2013 were chosen because 2007 is the first year that reliable redemption data was available in the state. Prior to 2007, redemption data for some counties was combined if those counties shared a farmers' market. Redemption rate for each county is calculated as: *(Number of coupons redeemed by farmers ÷ Number of coupons issued by WIC) x 100*. For Catawba County, this redemption data reflects use of FMNP coupon at the three participating farmers' markets i.e., CCPH FM, the Downtown Hickory Farmers' Market, and the Conover Farmers' Market. In addition, the redemption reports from 2009-2013 included data about program volume such as the total number of WIC FMNP eligible individuals and the number of eligible individuals who received coupons. Program volume data was not available for the years 2007 and 2008.

Sales data for each individual farmers' market was also obtained from NSB, though redemption data at the market-level is not available from the state due to the process of coupon allocation at the county-level. Thus, the redemption rate reflects coupon redemption overall in Catawba County, and not per farmers' market. However,

FMNP coupons at the CCPH FM were tracked each week by hand and then entered into a spreadsheet. This allowed the research team to know exactly how many FMNP coupons were redeemed at the CCPH FM.

Furthermore, Catawba was closely matched to the case-control county of Cabarrus. The two counties were matched on demographics from the U.S. Census, and program characteristics such as total number of WIC FMNP eligible individuals, percentage of eligible individuals served, number of coupons issued, and farmers' market availability. The main difference between the two counties is that, unlike Catawba County, Cabarrus County did not have a new farmers' market located at the WIC clinic.

Data Analysis

Specific Aim 1: To test the hypothesis that the 2013 redemption rate in Catawba County would be significantly higher than in previous years, redemption rates for Catawba County from 2007-2013 were first plotted and graphed before being averaged. Additionally, the actual 2013 redemption rate was compared to the predicted 2013 redemption rate. In order to calculate the 2013 predicted redemption rate, the number of coupons redeemed along with redemption rates from 2007-2012 were plotted and assessed for trend by linear regression.

Specific Aim 2: A ranking system was developed in order to compare redemption rates between Catawba County and the other participating FMNP counties in North Carolina. First, the 37 of 100 North Carolina counties that participate in the program were ranked each year from 2007-2013 based on redemption rate only. Counties were ranked from

1 to 37, with 1 being the highest redemption rate and 37 being the lowest redemption rate. Rates from 2009-2013 were further compared using a weighted ranking system, which accounted for not only redemption rate but also the percentage of eligible individuals served. Weighted rank was calculated as: (*% redemption * % eligible individuals served*). The main advantage of the weighed rank is that it provides information about program impact (i.e. the number of people receiving FMNP benefits) as well as redemption.

Specific Aim 3: To test the hypothesis that redemption rate in Catawba County was higher than a control, Catawba County was closely matched to the case control county of Cabarrus. In order to compare redemption between the two counties, the number of coupons redeemed by WIC FMNP participants in each county from 2007-2013 were plotted and graphed.

Results

Specific Aim 1: The WIC FMNP budget for coupon allocation in North Carolina was approximately \$215,000 for the 2013 season. Overall, the redeemed coupons represented \$105,480 in revenue for North Carolina farmers in 2013. In 2013 the redemption rate in Catawba County was 62.9%, representing an increase of 11.6 percentage points from 2012. The predicted 2013 redemption rate in Catawba County was only 52.4 ($r^2 = 0.0403$). Figure 11 shows the linear trend in redemption data for Catawba County, while Table 3 represents the percentage point change from the previous year and overall rank.

Figure 11. Coupon Redemption in Catawba County 2007-2013

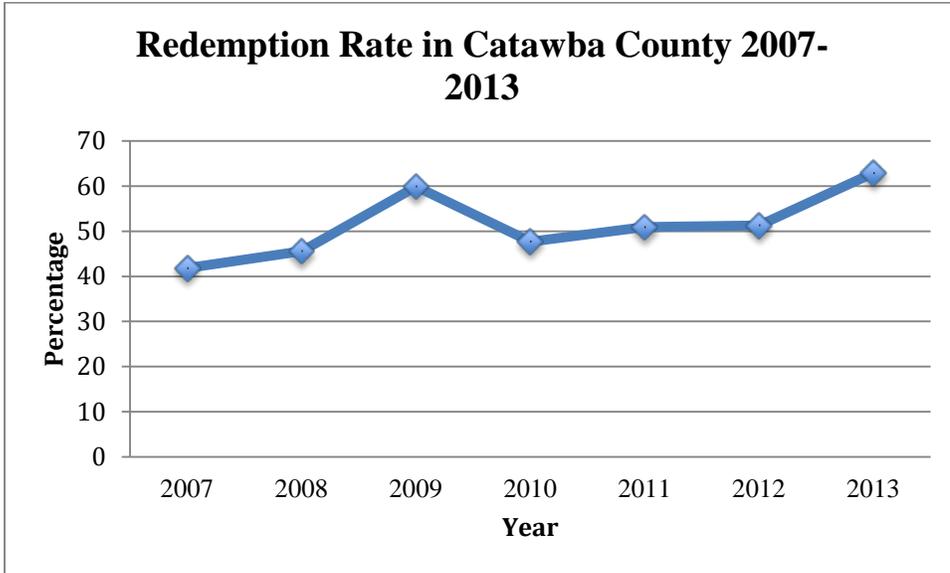


Table 3. Redemption Rates in Catawba County 2007-2013

| Year | Redemption Rate (%) | Percentage Point Change | Non-weighted Rank** |
|------|---------------------|-------------------------|---------------------|
| 2007 | 41.8 | +5.1* | 22 |
| 2008 | 45.6 | +3.8 | 23 |
| 2009 | 59.9 | +14.3 | 5 |
| 2010 | 47.7 | -12.2 | 17 |
| 2011 | 50.9 | +3.2 | 8 |
| 2012 | 51.3 | +0.4 | 11 |
| 2013 | 62.9 | +11.6 | 3 |

*Percentage point change from 2006-2007

**All participating counties in North Carolina

Furthermore, the CCPH FM sales represented \$4,888 in revenue for the twelve farmers who sold at the market. The CCPH FM redeemed 1222 out of 2538 coupons issued in Catawba County. This means that 48.1% of the issued coupons were spent at CCPH FM, while the remaining 51.9% of issued coupons were spent at the Downtown Hickory

Farmers' Market, Conover Farmers' Market, or nearby markets in Burke County.

Specific Aim 2: Of the 37 participating counties, the statewide average redemption rate in 2013 was 48.8%, while the lowest redemption rate was 24.6% in Haywood County, and the highest was 65.4% in both Wilkes and Union Counties. Historically, Union County has been the highest redeemer with an average rate of 66.4% since 2007. Table 4 represents 2007-2013 average redemption rates in the top 10 highest redeeming counties.

Table 4. Rate and Rank of the Top 10 Highest Redeeming Counties

| County | Average Rate (from 2007 to 2013) (%) | Ranking of Average Rate | Average of Rankings from (2007 to 2013) |
|----------|--------------------------------------|-------------------------|---|
| Union | 66.4 | 1 | 2 |
| Wake | 64.4 | 2 | 2 |
| Wilkes | 58.0 | 3 | 6 |
| Watauga | 55.6 | 4 | 7 |
| Robeson | 54.9 | 5 | 9 |
| Guilford | 54.8 | 6 | 7 |
| Pitt | 52.5 | 7 | 10 |
| Forsyth | 52.1 | 8 | 11 |
| Caldwell | 51.9 | 9 | 10 |
| Catawba | 51.4 | 10 | 11 |

Compared to the average redemption from 2007-2013 of the other 36 participating FMNP counties, Catawba County ranked 10th in overall average coupon redemption. In 2013, Catawba County ranked 3rd in overall coupon redemption. However, a weighted rank was also calculated in order to when take into account redemption along with percent of eligible individuals served. Data for eligible individuals served was only available starting in 2009. From 2009-2013, Catawba County had a weighted rank of 4th place. Table 5 represents the weighted rank of the top 10 redeeming counties from 2009-2013.

Table 5. Weighted Rank of the Top 10 Redeeming Counties 2013

| County | Average of (% eligible individuals * % redemption) from 2009-2013 | Weighted Rank from 2009-2013 | Weighted Rank 2013 Only |
|----------|---|------------------------------|-------------------------|
| Watauga | 0.21 | 1 | 2 |
| Union | 0.16 | 2 | 4 |
| Caldwell | 0.12 | 3 | 5 |
| Catawba | 0.12 | 4 | 3 |
| Pitt | 0.12 | 5 | 7 |
| Wilkes | 0.12 | 6 | 9 |
| Cabarrus | 0.12 | 7 | 8 |
| Davidson | 0.11 | 8 | 6 |
| Ashe | 0.11 | 9 | 1 |
| Wake | 0.11 | 10 | 16 |

Specific Aim 3: Catawba County was matched to the case control county of Cabarrus.

The below table reflects current U.S. Census Data for these counties, in addition to FMNP program characteristics. Most notably, these counties issue a similar number of FMNP coupons to WIC participants and reach a comparable rate of eligible individuals each season.

Table 6. County and Program Characteristics between Catawba (Case) and Cabarrus (Control)

| County Characteristics | Catawba | Cabarrus |
|----------------------------------|---------|----------|
| U.S. Census 2010 | | |
| Population | 154,358 | 178,011 |
| % Poverty | 13.4 | 11.9 |
| % White | 81.7 | 75.4 |
| % African American | 8.4 | 15.3 |
| % Hispanic | 8.4 | 9.4 |
| FMNP Eligible Individuals | 2,120 | 2,337 |
| FMNP Eligible Individuals Served | 423 | 444 |

| County Characteristics | Catawba | Cabarrus |
|------------------------------------|----------------|-----------------|
| % FMNP Eligible Individuals Served | 19.95 | 19.00 |
| Number of FMNP Coupons Issued | 2,538 | 2,664 |
| Number of FMNP Coupons Redeemed | 1,596 | 1,153 |

Moreover, these two counties had a similar level of farmers' market availability in previous seasons. Catawba County offered two farmers' market locations, which were available on one weekend day and two weekdays, for a total of 14.5 available hours of operation. Similarly, Cabarrus County offered three farmers' market locations, which were available on one weekend day and three weekdays, for a total 11 hours of operation.

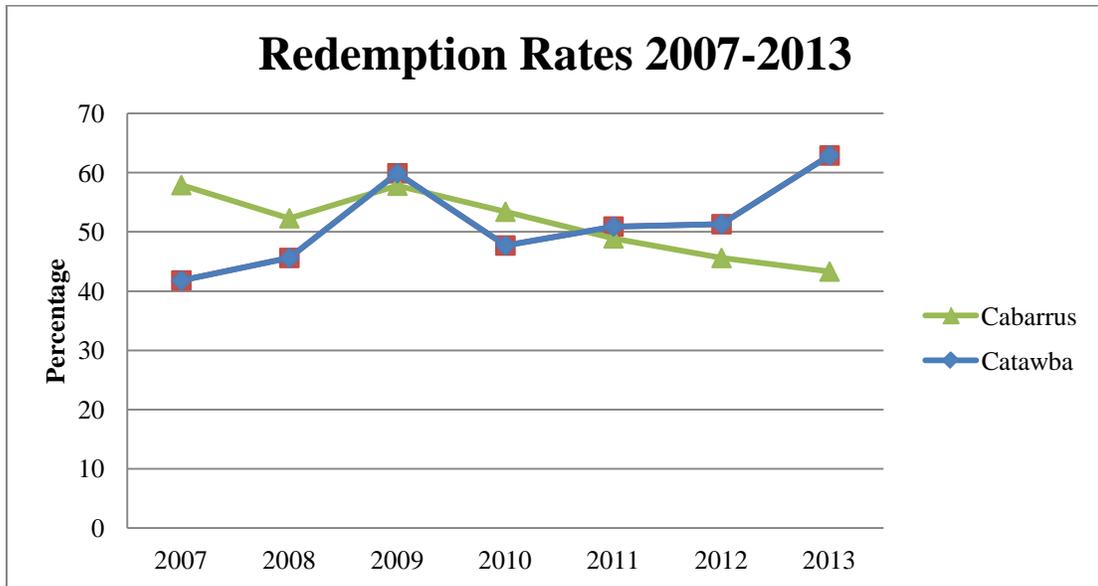
Redemption rates in these two counties were compared from 2007-2013. Table 7 compares redemption rate for 2013 and previous years between these counties.

Table 7. Case Control Redemption Data between Catawba (Case) and Cabarrus (Control) 2007-2013

| County | Year 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---------------|------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Catawba | 41.8 | 45.6 | 59.9 | 47.7 | 50.9 | 51.3 | 62.9 |
| Cabarrus | 57.9 | 52.3 | 57.8 | 53.4 | 48.9 | 45.6 | 43.3 |

In comparing the 2013 redemption data, the rate in Catawba County increased by 11.6 percentage points though the rate in Cabarrus decreased by 2.3 percentage points. Most notably, the 2013 rate in Catawba County is 19.6 percentage points higher than the rate in Cabarrus County. Figure 12 shows the linear distribution of redemption rates in Catawba County and Cabarrus County from 2007-2013.

Figure 12. Coupon Redemption in Catawba and Cabarrus Counties 2007-2013



Unlike in Catawba County, there is a decrease in linear trend for Cabarrus County.

Furthermore, rank and weighted rank were compared in each county. The 2013 rank by redemption rate only in Catawba and Cabarrus Counties were 3 and 24, respectively.

When taking into account program impact along with redemption, the 2013 weighted rank in Catawba County was 0.13 (3rd) and 0.08 (8th) in Cabarrus County. As a whole, these data present a strong case that the efforts to increase redemption in Catawba County have been succeeding.

Discussion

This study examined the impact of the implementation of an on-site WIC clinic farmers' market on FMNP coupon redemption rate. The hypothesis that a farmers' market located in the parking lot of the WIC clinic would increase FMNP coupon redemption in Catawba County was generally supported. Specifically, the hypotheses

that the FMNP redemption rate in Catawba County would be higher in 2013 than in previous seasons (2007 -2012), and that the redemption rate for 2013 in Catawba County will be higher than the redemption rate in the control county were supported.

This study highlights the importance of leveraging resources at the local or community level in order to work towards addressing barriers to FMNP redemption and to support the production and sale of healthy foods. Only one other study has demonstrated effective ways to increase FMNP redemption, including improved collaboration among state and local-level stakeholders and enhanced nutrition education efforts. However, that study did not investigate the physical location of farmers' markets or attempt to mitigate environmental barriers experienced by FMNP participants, such as lack of transportation (Conrey et al., 2003). For example, Schneider and colleagues found that non-Hispanic WIC clients were less likely to redeem coupons if barriers such as lack of variety, parking, long distances, and unfavorable weather existed (Schneider, McDonnell, & Neyman Morris, 2012). In another study, several FMNP participants asked for improvements in the location and operating times of the farmers' markets because the markets were difficult to access and only open for a limited number of hours during the workday (Joy et al., 2001). This is the first study to investigate the impact of physical market location on FMNP redemption rates.

However, a number of studies have implemented strategies to foster physical and economic access to healthy foods, including efforts to locate supermarkets in food deserts, promote healthy corner stores, offer incentives to purchase healthy foods, develop mobile farm stands (also known as “veggie vans”) and community supported agriculture

programs, and expand farmers' markets by increasing operating hours and locations (Freedman, Bell, & Collins, 2011; Holben, 2010; Morton & Blanchard, 2007). Results of farmers' market initiatives targeting low-income populations indicate that the addition of new farmers' market locations helps in improving access to F & V and increasing intake (Freedman et al., 2013; Evans et al., 2012). As suggested by Markowitz (2010) it is crucial that the markets located in low-income neighborhoods be situated in convenient locations and provide farmers with a built-in client base. The location of the CCPH FM was convenient for WIC clients, but also positioned near a hospital and Department of Social Services, giving farmers access to an adequate client base. Results from this study demonstrate that locating farmers' markets at WIC clinics, in particular, can decrease barriers for participants and increase redemption rates, while simultaneously providing farmers with a new stream of revenue. However, it is unknown if this type of model could be effective in a rural county, which has a smaller number of clients visiting the local health department and/or WIC clinic. Without a built-in client base, it would be difficult to make the market worthwhile for farmers in terms of increasing their revenue and access to a new customer base. Given that WIC FMNP participants experience multiple barriers in redeeming their coupons, it is likely that a series of program enhancements, including some strategies utilized by Conrey et al. (2003), would further improve redemption. Recommendations for WIC FMNP program enhancements in North Carolina include the addition of more WIC clinic farmers' markets, follow up phone calls to participants to remind them to spend their FMNP coupons, classes to improve cooking literacy, and farmers' market tours in order to show participants how to

spend their FMNP coupons. Thus far these strategies have only been implemented in a few FMNP counties in North Carolina; for example, during the 2013 season Caldwell County conducted farmers' market classes, while Pasquotank County targeted FMNP participants with reminder phone calls and a short survey to better understand why clients are not redeeming their coupons (NSB, personal communication, April 2014). It is especially important to have buy-in at the state and local level (Markowitz, 2010), particularly among local WIC Directors and Health Directors.

This study has some threats to internal validity, specifically the causal inference threats of history and confounding. For example, the increase in redemption rate could be attributed to other possible factors, such as reminder phone calls to WIC FMNP participants to encourage redemption and increased nutrition education efforts. In particular, WIC FMNP participants were asked and reminded to visit the on-site farmers' market on Thursdays, but were also given information about other local area farmers' markets. This would encourage redemption in general, and not only at the on-site farmers' market. This presents the inference threat of confounding of access to other farmers' market locations. However, it is unlikely that confounding of access to other markets presented an inference threat given that the county-level redemption rate includes all FMNP approved markets in the county. Also, the on-site farmers' market redeemed the most coupons of the three available markets.

Another possible explanation for yearly fluctuations in redemption rate is weather. However, weather is not a plausible explanation for increased redemption because the weather during the 2013 season was harsh, with severe flooding throughout the state and

in Catawba County in particular (WBTV 3 News, 2013). This made it difficult for farmers to provide the level of variety of produce they normally offer. The weather also made it challenging for some farmers to continue selling at the market, and two farmers had to discontinue selling at the market due to lost crops that were washed away in the floods.

Strengths of this study include the use of a case control design and the ability to validate redemption by tracking each redeemed coupon through the banking system. In order to ensure accuracy of redemption data, a quality check was conducted on each FMNP coupon processed through the banking system in order to account for and correct any errors, such as coupons returned to farmers by mistake. Adequate efforts were made to ensure farmers were paid for any redeemed coupons that were mistakenly rejected by the bank, including contacting those farmers and banks directly to resolve the issue. This quality check was in place to guarantee that each redeemed coupon was included in the final redemption report.

Despite the strengths of this study, it is not without limitations. The major limitation of this study is the use of only one county in the implementation of the on-site farmers' market. Researchers were unable to gain state-level buy-in for the implementation of multiple market sites, and future studies should evaluate the implementation and outcomes at multiple sites during the same season in order to strengthen the analysis. Another limitation of this study is the inability to better track

sales data at the market level. Providing farmers with a unique stamp for each market at which they sell, thereby making it easier to calculate and track redemption at the market level could solve this issue.

Conclusions and Implications

This study aimed to demonstrate that the implementation of a farmers' market targeted to WIC FMNP participants could increase redemption rates of coupons. Farmers' markets in North Carolina remain inaccessible to many WIC participants and solutions to barriers, such as lack of transportation and inconvenient market locations, have not been determined on account of limited fiscal resources and lack of appropriate infrastructure. More studies are needed to not only understand but to also diminish or reduce these barriers at the community-level. Farmers' markets located at WIC clinics, in particular, can enhance the FMNP program and increase redemption. The increase in redemption in Catawba County presents a strong case that efforts have been succeeding, and this model could be applied to other counties throughout the state. Specifically, this study could inform future WIC clinic market sites throughout the state, including best practices for market implementation and formation of community partnerships. For example, this program could be replicated at health departments in other counties with an adequate physical space for a market. There is also potential to replicate this program using fewer material resources and less start-up funding. Given that several FMNP counties in North Carolina have redemption rates at or below 30%, this study serves as a model to inform future initiatives in those counties in particular.

Primary decision-makers at the state level are invested in exploring new strategies to increase coupon redemption at the county level due to the success of this project (WIC Vendor Unit, personal communication, April 2014). In particular, these strategies need to be directed at mitigating future cuts to the FMNP budget in North Carolina. This is key since the program currently only operates in 37 of 100 North Carolina counties, and is in dire need of expansion funding in order to connect more WIC families with farmers' markets throughout the state.

Lastly, more studies are needed to explore and better understand barriers that prevent FMNP participants from redeeming coupons. New and innovative strategies are needed to address these barriers and raise WIC FMNP coupon redemption to the levels consistently seen in the SFMNP. This study contributes to the provision of new knowledge about how minimizing barriers to farmers' markets can help WIC clients, and in the long term may improve F & V intake. Additionally, this study has the ability to broadly influence nutrition policy, and may lead to advocacy efforts specifically targeting the expansion of WIC and SNAP at farmers' markets. For example, one key recommendation is the adoption of the WIC Cash Value Voucher (CVV), a food instrument specific to fresh F & V at grocery stores, at farmers' markets. This model has been effective in other states in increasing economic access to farmers' markets among the WIC population (Carlyn Hood, Martinez-Donate, & Meinen, 2012). Currently, the CVV is only accepted in grocery stores and supermarkets in North Carolina, and should

be expanded to farmers' markets. This is a win-win for both farmers and WIC participants since the FMNP program faces significant budget cuts, operates seasonally, and reaches only a small percentage of eligible individuals. Expansion of the CVV into farmers' markets would give WIC participants year-round access to local, nutritious foods.

CHAPTER VI

EPILOUGE

My involvement with the WIC Farmers' Market Nutrition Program (FMNP) first began in March 2011 when I was hired as a Public Health Program Consultant with the program. On behalf of the FMNP, I traveled to over sixty farmers' markets throughout the state and had conversations with hundreds of local farmers and over thirty-five WIC Directors. Based on these personal observations and conversations, I realized that FMNP participants face significant barriers in redeeming their coupons. For example, during my trips I would often have to drive greater than twenty minutes from the WIC office to the local farmers' market, a distance I felt was too far for a WIC participant who had already traveled for their appointment at the clinic. Farmers were also frustrated with the program because not enough WIC participants were coming to the farmers' market, and they viewed this as a lost opportunity to gain a new client base, not to mention a direct loss of profit. Despite awareness of these barriers at the state-level, there was nothing being done to help WIC participants better access the local farmers' markets and address the low levels of FMNP coupon redemption. I wanted to better understand this problem and began to have informal conversations with state and local-level WIC staff about potential solutions. Overwhelmingly, WIC Directors and their staff thought that

transportation was the main barrier keeping FMNP participants from spending their coupons, along with limited hours of market operation or the need for new locations in underserved areas. Market availability appeared to be central in addressing the problem, along with removing or mitigating the transportation barrier.

During the summer of 2011, I met with the WIC Director in Catawba County, on a routine FMNP visit. It was then we had the initial conversation about the idea of setting up a new farmers' market in the parking lot of the WIC clinic. The potential of setting up a new market seemed like no small feat, especially to a staff that is already stretched thin. The WIC Director, however, thought that the staff at Catawba County Public Health (CCPH) would be ready and willing to take on this challenge. At the end of the 2011 FMNP season, I started my PhD work but wanted to continue to be involved with FMNP in a research capacity. I had a series of meetings at the state-level, about the idea of setting up parking lot farmers' markets at WIC clinics. These meetings included individuals from WIC and the North Carolina Department of Agriculture and Consumer Services, the agency in charge of approving farmers' markets to accept WIC FMNP. The next, and most difficult, step in the process was to gain buy-in and support from the state-level Nutrition Services Branch (NSB). In fall 2011, I began this process and tried several times to gain permission before tabling the project and moving on to other research. Overall, it took two years to gain relevant support and begin to move the project forward.

I chose CCPH as my community partner for several reasons including the high level of buy-in from the county health director. CCPH was also invested in using the

implementation of the farmers' market to meet goals set by both the Eat Smart Move More Coalition and the CDC Community Transformation Grant program. In many ways, the timing was perfect, particularly since CCPH had received a grant from Eat Smart Move More that could be used as start-up funding for the farmers' market. The location of CCPH was also ideal, given that it is situated between a hospital and the Department of Social Services, and also houses many clinics in one building such as WIC and dental. This location gave the farmers more potential for a built-in client base despite the fact that CCPH is not visible from the main road.

Farmers' markets are inherently political, and it was difficult to plan for all of the unanticipated issues that arose throughout the season. This project taught me more about the value of teamwork and balancing the interests of multiple stakeholders. Community partnerships are often fraught with miscommunication and other problems, but I did not experience that during this project. Instead, the various community partners were focused on the primary goal of improving access to fresh produce, and we used this opportunity to learn from and support each other to ensure the success of the market. I had to learn to focus on the project as a whole, and not only the research activities. Each market day required an open-minded attitude because there were inevitably things that went wrong and we, as a team, had to be prepared to act. Some issues that arose included sudden rain, harsh heat that led to health and safety concerns, disputes between farmers, customers receiving subpar produce, farmers arriving late, staff that did not come for their shifts, smoking on the tobacco-free campus, and even one car accident in the parking lot.

The local farmers were also central to the success of the market, and at times the team relied on their expertise. As a whole, the farmers provided high quality produce and ample variety. All of them had to work long hours to prepare for the market, and often they did this work without the assistance of others. However, I was not pleased that some farmers brought produce that may have been grown out of state, or was wholesale. This was not a typical occurrence but did happen over the course of the season, and was not limited to one farmer. I hope that in the future CCPH is able to better enforce the market operational rules, even if this means conducting site visits at the farms. The farmers reminded us that, at the end of the day, the farmers' market was a business. I also appreciate the enthusiasm and kindness displayed by the farmers, especially towards the WIC participants. The farmers would often give WIC participants extra produce for free.

Although I am pleased with the overall outcomes of this project, there remain several things I would have done differently. Specifically, this was my first time writing a survey and I had to balance the interests of CCPH against my research. I was ultimately not happy with the format of the survey since it was limited to two pages. This length was chosen as not to overburden visitors with a long list of questions. This means that some important questions were not asked, and I would have liked to include more questions pertaining to WIC FMNP barriers. Also, the instructions of the survey were unclear to some visitors, leading them to skip questions or choose only one response. In the future, I would revise the survey to make the questions and instructions more clear, in addition to expanding the section on WIC FMNP. Also, I would have liked to collect more interviews with farmers but it was difficult to schedule them after the season ended.

One major barrier throughout the project was distance traveled. CCPH is located approximately 300 miles roundtrip from my home, and over the course of the project I drove over 12,000 miles to participate in the market, attend meetings, and conduct interviews with staff and farmers.

This project also helped me improve my research skills and I am now on a more solid path to becoming an independent investigator. In particular, I had the opportunity to build a community partnership from scratch and hone my qualitative interview techniques. I have previous experience with qualitative interviews, but interviews in this project were challenging because the questions had to be tailored to the various groups of stakeholders (i.e. farmers or CCPH staff). I also learned how to be consistent when taking notes during interviews and direct observation, and how to juggle many research tasks at once. At times, it was difficult to operate independently and finish all of the tasks on each market day. I was also able to involve four research assistants on various tasks. This also taught me how to manage research assistants, while also training and teaching them new research skills.

I was, and continue to be, highly motivated to improve the FMNP program. I currently have several counties interested in planning markets at their WIC clinic. During the 2015 season, I hope to organize more WIC-based markets and develop further partnerships throughout the state. I will also continue to push state-level WIC administrators to adopt the Cash Value Voucher (CVV), a food instrument used to purchase fresh fruits and vegetables in grocery stores, at farmers' markets. Currently the CVV is only accepted at grocery stores in North Carolina though other states have

demonstrated that the CVV is appropriate for farmers' markets as well. I believe that the adoption of the CVV at farmers' markets would increase economic access to fresh, local produce among the WIC population in general, and not only those receiving FMNP coupons.

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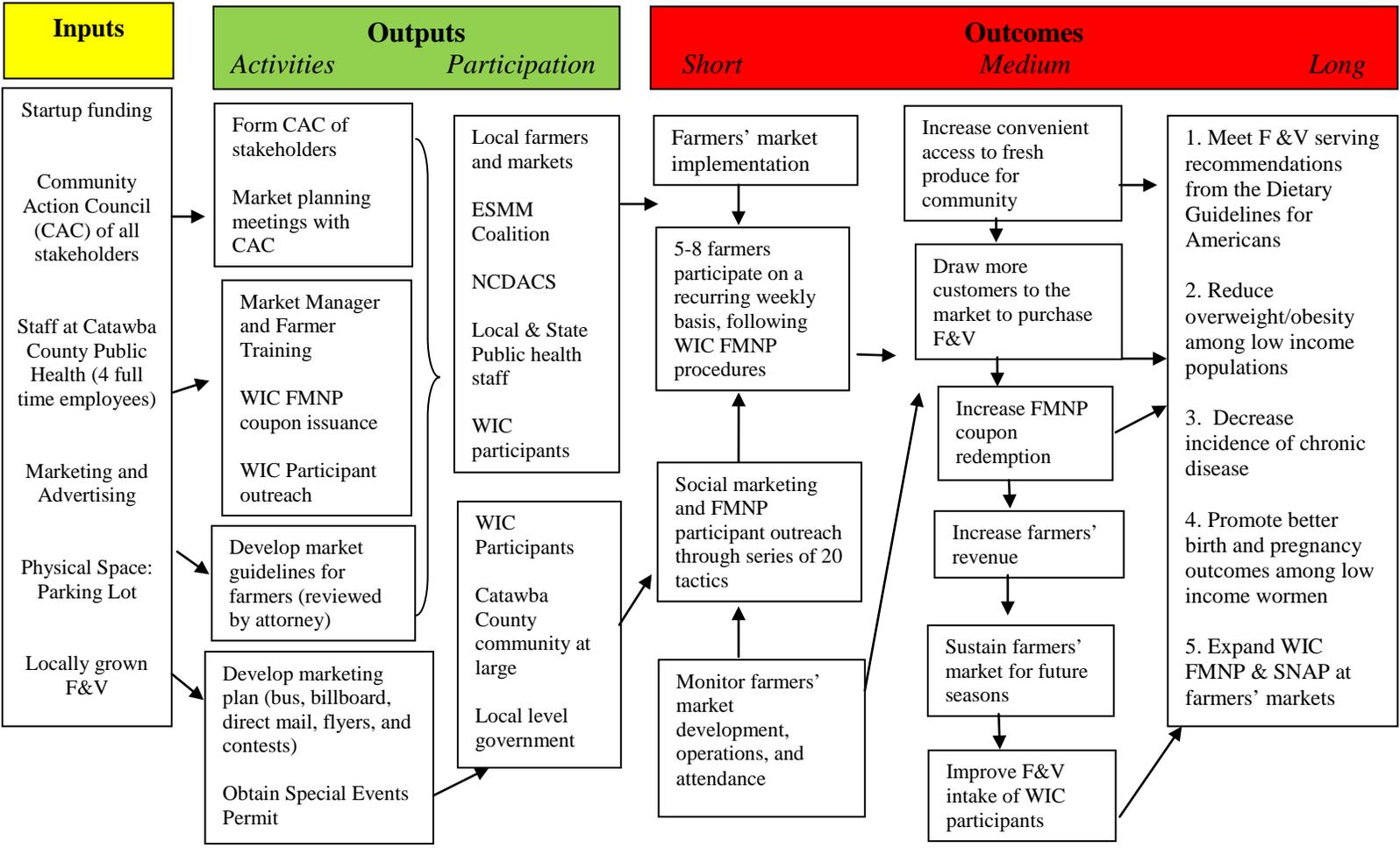
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APPENDIX A

LOGIC MODEL

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APPENDIX B

INTERVIEW GUIDE--STAFF

Name: _____ Date: _____ Start time: _____
End time: _____ Interviewer: Lanae Ball

**Catawba County Public Health Farmers' Market
Staff Interview**

Topic: Personal role in organizing or participating in the CCPH FM

1. What is your role in the Catawba County Public Health Farmers' Market?
 - a. What is your job title?
 - b. What is your role in the farmers' market?
 - c. On average, how much time do you devote to the CCPH FM on a weekly basis during the season?
 - d. What about before the season?
2. How did you first become involved in your role in the CCPH FM?

- a. Prompts: How did you hear about the project? Who told you?

3. Why did you want to participate in the CCPH FM?

4. From your perspective, what is the main purpose of the CCPH FM?

Topic: Key steps in organizing the CCPH FM Staff:

5. Were you involved in the planning process for the market?
 - a. What was your main role?

 - b. When was your first involvement in market planning?

6. From your perspective, what were the key components and/or steps in planning the market?

a. Prompt: organizing staff, recruiting farmers, market logistics (i.e. permits, permissions, maps/layout, etc.), marketing/advertising, WIC FMNP, nutrition education

7. Who helped you plan and/or organize the market?

8. If you were not involved in planning the market, when did you personally start working on the market?

a. What was your main job/duty at the market?

9. How much time did you devote to this market on a weekly basis?

10. From your perspective, what were the key components and/or steps in running the market week to week? Prompt: set up, tear down, info table, WIC

11. From your perspective, which staff/volunteers are key/essential in running the market from week to week?

Topic: Key Success Factors and Market Sustainability/ Perceived Program Barriers and Recommendations

12. Did you experience any challenges or barriers (e.g., competing priorities, organizational challenges, job role changes, technological challenges) that kept you from participating in the market at the level that you would have liked to participate?

Prompt, as necessary:

a. Were you able to participate in as many of the market events as you wanted to participate in? If not, why?

13. Can you think of anything the CAC/CCPH FM could do differently to address the challenges or barriers that might keep people from participating fully?

14. What made it difficult to operate the market week to week?

15. What resources are essential to operating the market?

16. Do you have any changes/recommendations for future farmers' market seasons?

a. What would you do differently next season? Prompt about personal role.

b. Do you have any recommendations to make the market more successful?

17. Do you think this farmers' market can operate again next season? Why or why not?

18. Are you personally planning to participate in the farmers' market again next season? Why or why not?

19. On a scale of 1 to 10 (1 being a complete failure, and 10 being a total success) how would you rate the CCPH FM?

20. Do you think the current level of resources (grant funding, staff support, etc) was adequate to operate the market this season?

a. Could the market operate on fewer resources in the future?

Topic: Social, Environmental, Health, and Program Related Outcomes

21. What did you hope to achieve by joining the project?

a. What benefits did you expect to receive as a result of participating in the project?

b. When you joined the project and/or CAC, were you looking for a solution to a specific problem or were you more broadly interested in expanding your knowledge or expertise around the topic of connecting local foods and public health?

22. As you became involved in the project and/or CAC, did you discover other reasons for participating that you did not initially anticipate?

23. In what way(s) has the market met your expectations and/or needs?

24. In what way(s) has the market failed to meet your expectations and/or needs?

25. Has participation in the market and/or CAC helped you make connections with other people or organizations? If so, what types of connections and with whom?

Prompt, as necessary:

a. Has participation in the market and/or CAC helped you make connections with people within your own organization? If so, please describe.

b. Has participation in the market and/or CAC helped you make connections with people in other organizations and/or agencies? If so, please describe.

26. In what way(s) do you think your new connections with people or organizations made through the market and/or CAC have benefitted individuals, organizations, and public health in general?

Prompt, as necessary:

a. Do you think you have benefitted on an individual or personal level from these new connections? If so, please explain.

27. Can you think of ways in which your organization has benefitted from the new connections made through the market? If so, please explain.

i. Prompt as needed for increased individual knowledge that has been shared with others in their home organization, individual knowledge gained in the market that was applied in their home organization, organization to organization sharing, and efficiencies gained by learning from others

28. Do you think the new connections have had (or will have) an impact on public health in general? If so, please explain.

i. Prompt as needed for changes in public health systems, infrastructure, and changes that have allowed the organization to communicate with other organizations and agencies, etc.

29. In your opinion, what are the most important outcomes or benefits that have resulted from the CCPH FM?

30. Those are all the questions I have for you today. Are there any other comments you would like to provide?

APPENDIX C

INTERVIEW GUIDE--FARMER

Name: _____ Date: _____ Start time: _____
End time: _____ Interviewer: Lanae Ball

**Catawba County Public Health Farmers' Market
Farmer Interview**

Topic: Personal role in organizing or participating in the CCPH FM

1. What is your role in the Catawba County Public Health Farmers' Market?

2. Where do you grow your produce?

3. Do you sell at any other farmers' markets? If so, where?
 - a. How long have you been selling at that market?

4. How did you first become involved in your role in the CCPH FM?
 - a. Prompts: How did you hear about the project? Who told you?

5. Why did you want to participate in the CCPH FM?

6. From your perspective, what is the main purpose of the CCPH FM?

Topic: Key steps in organizing CCPH FM

7. What preparation is required to sell produce at the CCPH FM?

a. If not, did you need more help?

8. Did you have help preparing and selling at the market?

9. What would you typically sell at the market each week?

a. What kinds of fruits and vegetables would you bring?

b. How much would you bring?

- c. Did you change the amount of fruits and vegetables you brought based on demand?

- d. Did you decide to stop bringing certain items due to no interest from customers?

- e. Did you sell any items that were not fresh fruits and vegetables?

- f. On average, how much did you sell at the market each week?

- g. What was your most popular item(s)?

Prompt: What did you like/dislike?

10. Did you like participating in WIC Farmers' Market Nutrition Program?

11. Was it easy for you to accept the WIC FMNP coupons? Why or why not?

- a. Of your total sales, how much do you think was WIC FMNP?
- b. Did you experience any difficulty depositing your coupons in the bank?

12. Was it easy for you to accept the \$4 green WIC bonus bucks? Why or why not?

Topic: Key Success Factors and Market Sustainability/ Perceived Program Barriers and Recommendations

13. Did you experience any challenges or barriers (e.g., competing priorities, organizational challenges, job role changes, technological challenges) that kept you from participating in the market at the level that you would have liked to participate?

Prompt, as necessary:

a. Were you able to participate in as many of the market events as you wanted to participate in? If not, why?

14. Can you think of anything the CAC/CCPH FM could do differently to address the challenges or barriers that might keep people and/or other farmers from participating fully?

15. What made it difficult to operate the market week to week?

16. What resources are essential to operating the market?

17. What do you think about the market accepting SNAP EBT next season?

a. Would you be willing to accept SNAP tokens? Why or why not?

18. Do you have any changes/recommendations for future farmers' market seasons?

a. What would you do differently next season?

b. Do you have any recommendations to make the market more successful?

19. Would you sell at this market again next season? Why or why not?

20. Do you think this farmers' market can operate again next season? Why or why not?

21. On a scale of 1 to 10 (1 being a complete failure, and 10 being a total success) how would you rate the CCPH FM?

22. Do you think the current level of resources (grant funding, staff support, etc) was adequate to operate the market this season?

a. Could the market operate on fewer resources in the future?

Topic: Social, Environmental, Health, and Program Related Outcomes

23. What did you hope to achieve by joining the project?

a. What benefits did you expect to receive as a result of participating in the project?

b. When you joined the CAC, were you looking for a solution to a specific problem or were you more broadly interested in expanding your knowledge or expertise around the topic of local foods?

24. As you became involved in the CAC, did you discover other reasons for participating that you did not initially anticipate?

25. In what way(s) has the market met your expectations and/or needs?

26. In what way(s) has the market failed to meet your expectations and/or needs?

27. Has participation in the market and/or CAC helped you make connections with other people or organizations? If so, what types of connections and with whom?

Prompt, as necessary:

a. Has participation in the market and/or CAC helped you make connections with people within your own organization? If so, please describe.

b. Has participation in the market and/or CAC helped you make connections with people in other organizations and/or agencies? If so, please describe.

28. In what way(s) do you think your new connections with people or organizations made through the market and/or CAC have benefitted individuals, organizations, and public health in general?

Prompt, as necessary:

a. Do you think you have benefitted on an individual or personal level from these new connections? If so, please explain.

29. Can you think of ways in which your organization/farm has benefitted from the new connections made through the market? If so, please explain.

i. Prompt as needed for increased individual knowledge that has been shared with others in their home organization, individual knowledge gained in the market that was applied in their home organization, organization to organization sharing, and efficiencies gained by learning from others

30. Do you think the new connections have had (or will have) an impact on public health in general? If so, please explain.

i. Prompt as needed for changes in public health systems, infrastructure, and changes that have allowed the organization to communicate with other organizations and agencies, etc.

31. In your opinion, what are the most important outcomes or benefits that have resulted from the CCPH FM?

32. Those are all the questions I have for you today. Are there any other comments you would like to provide?

APPENDIX D

CONSENT FORM FOR INTERVIEW

UNIVERSITY OF NORTH CAROLINA AT GREENSBORO CONSENT TO ACT AS A HUMAN PARTICIPANT

Project Title: Catawba County Public Health Farmers' Market (IRB #13-0203)

Project Director: Jigna M. Dharod

Student Researcher: Lanae Ball

Participant's Name: _____

What is the study about?

This is a research project. This study is conducted to describe the process of organizing and locating a new farmers' market at Catawba County Public Health.

Why are you asking me?

This study is specifically interested in your personal role in organizing the farmers' market at Catawba County Public Health. Since you participated in the farmers' market and/or the Community Action Council for planning the farmers' market, you are being asked to participate.

What will you ask me to do if I agree to be in the study?

If you agree, we would like you to allow Lanae Ball (the student researcher) to conduct an interview with you about your role in organizing the farmers' market. The interview will take about one hour of your time.

Is there any audio/video recording?

This interview will be audio-recorded but your identifying information (name, address, etc.) will be kept confidential and not shared with anyone. The information you provide will be kept **strictly confidential** and interview transcripts will be stored only with a pseudonym and an identification number, not with your name. You will not be identified directly in any report or publication of this study or its results.

How will you keep my information confidential?

Your privacy will be protected. You will not be identified by name or other identifiable information as being part of this project. All information obtained in this study is strictly confidential unless disclosure is required by law. Copies of interview files will be stored under lock and key in Stone Building 339 at the University of North Carolina at Greensboro.

What are the dangers to me?

The Institutional Review Board at the University of North Carolina at Greensboro has determined that participation in this study poses minimal risk to participants. But, if you have any concerns about your rights, how you are being treated, or if you have questions, want more information or have suggestions, please contact the Director in the Office of Research Integrity at UNCG toll-free at (855) 251-2351. Questions, concerns, or complaints about this project or benefits or risks associated with being in this study can be answered by Jigna M. Dharod who may be contacted at (336) 334-9708.

Voluntary Consent by Participant

Your participation in this study is completely **voluntary**. You have the right to withdraw your consent or stop your participation at any time without penalty. You also have the right to refuse to answer particular interview questions and ask that the audio-recorder be turned off at any point during the interview.

By signing this consent form you are agreeing that you read, or it has been read to you, and you fully understand the contents of this document and are openly willing consent to take part in this study. All of your questions concerning this study have been answered. By signing this form, you are agreeing that you are 18 years of age or older and are agreeing to participate in this study to described to you by

_____.

Signature: _____ **Date:** _____

APPENDIX E
OBSERVATION FORM

Catawba County Public Health Farmers' Market: Observation Form
Date _____

Farmer Attendance

| Name | Notes |
|------|-------|
| | |
| | |
| | |
| | |
| | |
| | |
| | |

Farmers' Market Customer Attendance

(Attendance tracking will begin at 10:45 AM, before the official start time of 11 AM and continue until 2 PM)

| 11:30 | 12:00 | 12:30 | 1:00 | 1:30 | 2:00 |
|-------|-------|-------|------|------|------|
| | | | | | |

Problems Encountered

Notes

Notes (cont'd.)

Produce Availability and Pricing (attach additional sheet if necessary)

| Produce Item | Farmer/Price | Farmer/Price | Farmer/Price | Comments |
|--------------------|--------------|--------------|--------------|----------|
| | | | | |
| Apple | | | | |
| Beets | | | | |
| Bell pepper | | | | |
| Blueberry | | | | |
| Broccoli | | | | |
| Cabbage | | | | |
| Cantaloupe | | | | |
| Cauliflower | | | | |
| Corn | | | | |
| Cucumbers | | | | |
| Eggplant | | | | |
| Green beans | | | | |
| Hot pepper | | | | |
| Leafy greens | | | | |
| Lettuce | | | | |
| Mixed salad greens | | | | |
| Okra | | | | |
| Onion | | | | |
| Other beans | | | | |
| Peach | | | | |
| Peas | | | | |
| Potato | | | | |
| Pumpkin | | | | |
| Radish | | | | |
| Strawberry | | | | |
| Sweet Potato | | | | |
| Tomato | | | | |
| Watermelon | | | | |
| Yellow Squash | | | | |
| Zucchini | | | | |

APPENDIX F

CATAWBA COUNTY PUBLIC HEALTH FARMERS' MARKET 2013 OPERATIONAL RULES

Participation

In order to participate, a vendor must complete an application and receive approval from the Market Manager. Vendors must commit to regular attendance at the market. In order to effectively promote the market, vendors are required to notify the market manager of their plans to attend by noon Tuesday of each market week. Catawba County Public Health Farmers Market will handle all marketing and promotion for the farmers market.

Rules/Regulations/Policies:

1. All vendors must be certified to accept WIC FMNP vouchers by the North Carolina WIC Office. WIC FMNP certified farmers are held accountable for understanding all procedures and rules of the WIC FMNP Program and are responsible for training all other persons who will be acting on their behalf at the market.
2. Vendors must abide by all applicable federal, state, and local health and label regulations and provide a copy of all required certification, inspections and licenses prior to selling at the market.
3. All vendors are expected to arrive no later than 10:30 a.m. and remain until closing at 2:00 p.m. even if they have sold all their goods. Exceptions to this policy must be approved in advance by the Market Manager.
4. There will be no moving vehicles in the market area during market hours. If you arrive late or receive permission to leave early, you must park in an adjacent area and walk your merchandise and supplies (tents, tables, etc.) to and from your vendor space.
5. Farmers must allow on-farm visits to verify product sources. Farmers must produce at least 50% of the produce they are selling. All produce sold at the market must have been grown in North Carolina.
6. All vendors must have easy to read signs with the name of their farm, location and prices of their products listed at their space.
7. Each vendor must display a WIC Farmers Market Nutrition Program poster at all times.

8. Tent shall be properly anchored/secured to prevent blowing over or up-lifting.
9. Combustible materials such as hay, straw, or shavings shall not be located within any tent.
10. The Market Manager has the continuing authority to conduct inspections of vendor spaces on market day and deny any person the privilege of operating at the market for any conduct that is detrimental or contrary to market policies.
11. Vendors at the market must not approach a buyer for the purpose of making a sale while said buyer is in conversation with another vendor.
12. Market tenants shall confine the piling and display of produce to the space provided to them.
13. Children under 14 years of age shall not be permitted to roam or wander around the market or inside the Public Health building unless accompanied by an adult who shall be responsible for their conduct.
14. The Market Manager may require that all produce sorted out as culls or otherwise considered of no commercial value shall be placed in containers and destroyed or removed from the market premises. The disposition of such product(s) shall be the responsibility of the person or firm in whose possession the product may be.
15. Other than market-sanctioned community outreach programs, the market does not allow solicitations for products, services or charitable contributions on market grounds. However, vendors are allowed to display printed promotional materials for enterprises or events related to their farm or business.

Prohibited Activities and Behaviors

1. Cooking, slicing, or serving produce that is not whole.
2. The use of electricity and generators.
3. The use of profane, abusive, or discourteous language.
4. Gambling or the consumption of alcohol.
5. Smoking or the use of other tobacco products, including electronic cigarettes. The use of any tobacco product is prohibited on the grounds, buildings, parking lot, and within vehicles.

6. The use of fireworks or firearms.
7. Selling produce or products that fail to meet the standards or requirements of federal, state or local laws and regulations (e.g., selling canned produce without state certification).
8. Topping or facing of containers with best products exposed and poor products concealed.
9. Abandonment of produce, vehicles or other articles.
10. Fraudulent, dishonest or deceptive practices.
11. Accepting tips or gratuities.
12. Riding bicycles, skateboards or other similar devices.
13. Animals, with the exception of service animals for the handicapped.
14. Holding space by use of parked vehicles, belongings, etc..
15. Dumping produce (charging significantly less than current market rates for a product with the objective of gaining an advantage over other producers).

APPENDIX G
MEDIA EXAMPLES

Catawba County Public Health
July 12

Catawba County Public Health celebrated the official summer kick off of its farmers market with a ribbon cutting yesterday.

The kick off coincided with the Women, Infants, and Children (WIC) program's distribution of WIC Farmers Market Nutritional Program vouchers to WIC participants.

Read more: <http://bit.ly/178UQ70>



Photo courtesy of ©2013 Pat Appleson Studios, Inc.

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441 people saw this post

Boost Post

APPENDIX H

CATAWBA COUNTY PUBLIC HEALTH FARMERS' MARKET CUSTOMER SURVEY

The purpose of this survey is to understand the purchasing behaviors of customers at the Catawba County Public Health Farmers' Market and to help us improve the farmers' market for future seasons. This survey is conducted in partnership with the University of North Carolina at Greensboro Department of Nutrition. Thank you for your time and shopping at our market!

1. Which of the following describes you: *(You may check more than one answer)*

- | | | |
|--|---|---------------------------------------|
| <input type="checkbox"/> Public Health employee | <input type="checkbox"/> WIC client | <input type="checkbox"/> DSS client |
| <input type="checkbox"/> CVMC employee | <input type="checkbox"/> Public Health client | <input type="checkbox"/> DSS employee |
| <input type="checkbox"/> Live or work within 5 miles | <input type="checkbox"/> CVMC (hospital) client | <input type="checkbox"/> Other |
-

2. How did you hear about this farmers' market? *(You may check more than one answer)*

- | | | |
|--|---|--|
| <input type="checkbox"/> Word of mouth/ Family & friends | <input type="checkbox"/> WIC Clinic | <input type="checkbox"/> Catawba County Farmers Markets brochure |
| <input type="checkbox"/> Flyer | <input type="checkbox"/> Banner | <input type="checkbox"/> Other farmers' markets |
| <input type="checkbox"/> Roadside "campaign" signs | <input type="checkbox"/> Email | <input type="checkbox"/> Been here before |
| <input type="checkbox"/> Bus advertisement | <input type="checkbox"/> Billboard | <input type="checkbox"/> Other: |
| <input type="checkbox"/> Drove by the market | <input type="checkbox"/> Postcard in the mail | |
-

3. What makes you want to come to this farmers market? *(Check all that apply)*

- | | |
|---|--|
| <input type="checkbox"/> Variety of fresh fruits and vegetables | <input type="checkbox"/> Purchase foods grown locally |
| <input type="checkbox"/> Quality of fresh fruits and vegetables | <input type="checkbox"/> Easy way to redeem WIC FMNP coupons |
| <input type="checkbox"/> Low prices | <input type="checkbox"/> Easy way to redeem Senior FMNP coupons |
| <input type="checkbox"/> Taste of the fruits and vegetables | <input type="checkbox"/> Socialize with people from my community |
| <input type="checkbox"/> Convenience | <input type="checkbox"/> Support local farmers |
| | <input type="checkbox"/> Other: |
-

4. The prices at this farmers market are less expensive than at the grocery store where I usually shop:

- | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> |
| Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |

5. How did you pay for fruits and vegetables at the farmers' market today? (You may check more than one answer)

- Cash WIC FMNP Senior FMNP WIC Bonus Bucks Other _____

6. Today, approximately how much money (personal and WIC/Senior FMNP coupons) did you spend buying produce?

\$ _____

7. What did you purchase at the market today (Check all that apply):

- | | |
|---|--|
| <input type="checkbox"/> Tomatoes | <input type="checkbox"/> Lettuce or salad greens |
| <input type="checkbox"/> Yellow Squash/Zucchini | <input type="checkbox"/> Cabbage |
| <input type="checkbox"/> Leafy greens (mustard, turnip, etc.) | <input type="checkbox"/> Sweet Potatoes |
| <input type="checkbox"/> Broccoli/Cauliflower | <input type="checkbox"/> Apples |
| <input type="checkbox"/> Potatoes | <input type="checkbox"/> Berries |
| <input type="checkbox"/> Onions | <input type="checkbox"/> Peaches |
| <input type="checkbox"/> Bell Peppers | <input type="checkbox"/> Watermelon |
| <input type="checkbox"/> Hot Peppers | <input type="checkbox"/> Other: _____ |

8. This farmers' market helps me to increase the amount of fresh fruits and vegetables my family eats.

- Strongly Agree Agree Neutral Disagree Strongly Disagree

9. Counting today, how many times have you visited this farmers' market at Public Health?

10. Please list any fruits and vegetables that were not available (if any) you would like to see at the market:

11. What additional suggestions or improvements will help make this farmers market successful?

12. What is your age? 18-20 21-24 25-34 35-44 45-54 55-64 65-74 75+

13. Are you: Male Female

14. What best describes your race or ethnicity? *(You may check more than one)*

- | | |
|--|---|
| <input type="checkbox"/> White | <input type="checkbox"/> Native Hawaiian or other Pacific Islander, |
| <input type="checkbox"/> Black or African American | <input type="checkbox"/> American Indian or Alaskan Native |
| <input type="checkbox"/> Hispanic/Latino/ Spanish | <input type="checkbox"/> Bi-racial/Multiracial |
| <input type="checkbox"/> Asian | <input type="checkbox"/> Other: _____ |

15. What is your home zip code? _____

If you are a WIC client, please fill out the following questions:

16. Do you or your child receive WIC Farmers' Market Nutrition Program (FMNP) coupons? *(If not, please skip questions 17-22)*

- Yes No Does not apply

17. Is this your first time using WIC FMNP Coupons? Yes No

18. Where do you usually spend your FMNP coupons?

- | | | | |
|--|---|---|--|
| <input type="checkbox"/> This market | <input type="checkbox"/> Downtown Hickory Farmers' Market | <input type="checkbox"/> Caldwell County Farmers' Market (Lenoir) | <input type="checkbox"/> Hildebran Farmers' Market |
| <input type="checkbox"/> Conover Farmers' Market | <input type="checkbox"/> Morganton Farmers' Market | <input type="checkbox"/> Valdese Farmers' Market | <input type="checkbox"/> Other _____ |

19. Prior to coming here today, did you receive a phone call to remind you to use your coupons?

- Yes No

20. How has this farmers' market helped you use your FMNP coupons? *(Check all that apply)*

- | | | |
|--|--|--|
| <input type="checkbox"/> Made it easier to redeem my coupons | <input type="checkbox"/> Saved time | <input type="checkbox"/> Provided me food choices I wanted |
| <input type="checkbox"/> Reduced distance traveled | <input type="checkbox"/> I can take the bus here | <input type="checkbox"/> None |
| <input type="checkbox"/> I did not have a way to get to the other farmers' markets | <input type="checkbox"/> I learned new recipes to cook | <input type="checkbox"/> Other: _____ |

21. The \$4 WIC Bonus Bucks helped me to:

- | | |
|---|--|
| <input type="checkbox"/> Buy extra produce I planned to buy already | <input type="checkbox"/> Shop at this farmers' market for the first time |
| <input type="checkbox"/> Try a new fruit or vegetable | <input type="checkbox"/> Shop at this farmers' market more often |
| <input type="checkbox"/> None | <input type="checkbox"/> Other: _____ |

22. What did you buy today with the \$4 WIC Bonus Bucks?

Thank you for completing the survey!

APPENDIX I

ENCUESTA DEL CONSUMIDOR DEL MERCADO DE AGRICULTORES DEL CONDADO DE CATAWBA

El propósito de este estudio es comprender los comportamientos de compra de los clientes en el Mercado de Agricultores del Condado de Catawba para ayudar a mejorar el mercado en las próximas temporadas. Esta encuesta se realiza en colaboración con la Universidad de Carolina del Norte en el Departamento de Nutrición de Greensboro. Gracias por su tiempo y sus compras en nuestro Mercado!

1. Cuál de los siguientes te describe: *(Puede marcar más de una respuesta)*

- | | | |
|---|--|--|
| <input type="checkbox"/> Empleado de Salud Pública | <input type="checkbox"/> Cliente del WIC | <input type="checkbox"/> Cliente de DSS |
| <input type="checkbox"/> Empleado del CVMC (hospital) | <input type="checkbox"/> Cliente de Salud Pública | <input type="checkbox"/> Empleado de DSS |
| <input type="checkbox"/> Vive o trabaja a menos de 5 millas | <input type="checkbox"/> Cliente del CVMC (hospital) | <input type="checkbox"/> Otro _____ |

2. Cómo se enteró de este mercado? *(Puede marcar más de una respuesta)*

- | | | |
|---|--|--|
| <input type="checkbox"/> Familia y amigos | <input type="checkbox"/> Clínica del WIC | <input type="checkbox"/> Folletos del Condado de Catawba |
| <input type="checkbox"/> Volantes | <input type="checkbox"/> Pancarta | <input type="checkbox"/> Otros mercados |
| <input type="checkbox"/> Anuncios en la calle | <input type="checkbox"/> Correo electrónico | <input type="checkbox"/> He estado aquí anteriormente |
| <input type="checkbox"/> Anuncios en el bus | <input type="checkbox"/> Cartelera | <input type="checkbox"/> Otro: _____ |
| <input type="checkbox"/> Condujo por el Mercado | <input type="checkbox"/> Postal en el correo | |

3. Qué hace que usted quiera venir a este mercado de los agricultores? *(Marque todas las que apliquen)*

- | | |
|---|--|
| <input type="checkbox"/> Variedad de frutas y vegetales frescos | <input type="checkbox"/> Compra de alimentos cultivados localmente |
| <input type="checkbox"/> La calidad de frutas y vegetales frescos | <input type="checkbox"/> Manera fácil de cambiar los cupones de WIC y FMNP |
| <input type="checkbox"/> Precios bajos | <input type="checkbox"/> Manera fácil de cambiar los cupones |
| <input type="checkbox"/> El sabor de las frutas y vegetales | <input type="checkbox"/> Socializar con personas de mi comunidad |
| <input type="checkbox"/> Conveniencia | <input type="checkbox"/> Apoyar los agricultores locales |
| | <input type="checkbox"/> Otros: _____ |

4. Los precios en el Mercado de los agricultores son más baratos que en la tienda que suelo comprar:

- | | | | | |
|---|-------------------------------------|----------------------------------|--|--|
| <input type="checkbox"/> Muy de acuerdo | <input type="checkbox"/> De acuerdo | <input type="checkbox"/> Neutral | <input type="checkbox"/> En desacuerdo | <input type="checkbox"/> Muy en desacuerdo |
|---|-------------------------------------|----------------------------------|--|--|

5. Cómo pagó por sus frutas y vegetales el día de hoy? *(Puede marcar más de una respuesta)*

- | | | | | |
|-----------------------------------|-----------------------------------|--------------------------------------|--|--------------------------------------|
| <input type="checkbox"/> Efectivo | <input type="checkbox"/> WIC FMNP | <input type="checkbox"/> Senior FMNP | <input type="checkbox"/> WIC Bonus Bucks | <input type="checkbox"/> Otros _____ |
|-----------------------------------|-----------------------------------|--------------------------------------|--|--------------------------------------|

6. Hoy, aproximadamente cuanto dinero gasto comprando productos (personal, cupones)?

\$ _____

7. Qué compró en el Mercado el día de hoy? (Marque todas las que apliquen):

- | | |
|--|---|
| <input type="checkbox"/> Tomates | <input type="checkbox"/> Lechuga |
| <input type="checkbox"/> Calabacín /calabaza de cuello largo | <input type="checkbox"/> Repollo |
| <input type="checkbox"/> Lechuga verde (nabo , etc.) | <input type="checkbox"/> Papas dulces/ batata |
| <input type="checkbox"/> Brócoli / Coliflor | <input type="checkbox"/> Manzanas |
| <input type="checkbox"/> Papas | <input type="checkbox"/> Arándanos, moras |
| <input type="checkbox"/> Cebollas | <input type="checkbox"/> Melocotón |
| <input type="checkbox"/> Pimiento verde | <input type="checkbox"/> Sandía |
| <input type="checkbox"/> Pimiento picante / Chile | <input type="checkbox"/> Otro: _____ |

8. El Mercado de agricultores me ha ayudado a aumentar la cantidad de frutas y vegetales frescas que come mi familia.

- | | | | | |
|---|-------------------------------------|----------------------------------|--|--|
| <input type="checkbox"/> Muy de acuerdo e | <input type="checkbox"/> De acuerdo | <input type="checkbox"/> Neutral | <input type="checkbox"/> En desacuerdo | <input type="checkbox"/> Muy en desacuerdo |
|---|-------------------------------------|----------------------------------|--|--|

9. Incluyendo hoy, cuántas veces ha visitado este Mercado de Agricultores en la Salud Pública?

10. Por favor escriba el nombre de las frutas y vegetales que no estaban disponibles que le gustaría ver en el mercado:

11. Qué otras sugerencias o mejoras ayudarían a que este Mercado de Agricultores fuera más exitoso?

12.Cuál es su edad? 18-20 21-24 25-34 35-44 45-54 55-64 65-74 75+

13. Usted es: Masculino Femenino

14. Qué describe mejor su raza u origen étnico? (Puede marcar má de una respuesta)

- | | |
|---|--|
| <input type="checkbox"/> Blanco | <input type="checkbox"/> Nativo de Hawaii o de otra isla del Pacífico, |
| <input type="checkbox"/> Afroamericano | <input type="checkbox"/> Indio Americano o Nativo de Alaska |
| <input type="checkbox"/> Hispano/Latino | <input type="checkbox"/> Bi-racial/Multiracial |
| <input type="checkbox"/> Asiático | <input type="checkbox"/> Otro: _____ |

15.Cuál es el código postal de su domicilio? _____

Si es un cliente del WIC, por favor respond a las siguientes preguntas:

16. Usted o su hijo/a reciben cupones de WIC del Programa del Mercado de Agricultores (FMNP) ? (Si no, por favor no responda las preguntas 17-22)

- Sí No No aplica

17. Es esta su primera vez que utiliza los cupones del WIC o FMNP?

- Sí No

18. Dónde suele cambiar sus cupones de FMNP?

- | | | | |
|---|---|---|---|
| <input type="checkbox"/> En este mercado | <input type="checkbox"/> Downtown Hickory Farmers' Market | <input type="checkbox"/> Mercado de Agricultores del Condado de Caldwell (Lenoir) | <input type="checkbox"/> Mercado de Agricultores de Hildebran |
| <input type="checkbox"/> Mercado de Agricultores de Conover | <input type="checkbox"/> Mercado de Agricultores de Morganton | <input type="checkbox"/> Mercado de Agricultores de Valdese | <input type="checkbox"/> Otro _____ |

19. Antes de venir aquí hoy, recibió una llamada telefónica para recordarle que debe usar sus cupones?

- Sí No

20. Cómo le ha ayudado este Mercado de Agricultores utilizar sus cupones de FMNP? (Marque todas las que apliquen)

- | | | |
|--|--|---|
| <input type="checkbox"/> Es más fácil cambiar mis cupones | <input type="checkbox"/> Me ahorra tiempo | <input type="checkbox"/> Me dio seleccion de alimentos que quería |
| <input type="checkbox"/> Reduce la distancia que viajo | <input type="checkbox"/> Puedo venir en bus aquí | <input type="checkbox"/> Ninguno |
| <input type="checkbox"/> No tenia otra forma de ir a otros Mercado de Agricultores | <input type="checkbox"/> Aprendí nuevas recetas para cocinar | <input type="checkbox"/> Other: _____ |

21. Los \$4 WIC Bonus Bucks me ayudaron a:

- | | |
|---|--|
| <input type="checkbox"/> A coprar productos adicionales a lo que planeaba | <input type="checkbox"/> A comprar en este Mercado de Agricultores por primera vez |
| <input type="checkbox"/> A tartar una fruta o vegetal nuevo | <input type="checkbox"/> A comprar en este Mercado de Agricultores más seguido |
| <input type="checkbox"/> Nada | <input type="checkbox"/> Otro: _____ |

22. Que compró con su Bonus Buck de \$4.00 del WIC? _____

Gracias por completar este estudio!