

## **Implementation of a WIC clinic farmers' market improves accessibility and consumption of fresh fruits and vegetables among WIC farmers' market nutrition program participants**

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### **Abstract:**

Few data are available concerning the socio-demographic characteristics and fruit and vegetable (F&V) purchasing behaviors of visitors attending the farmers' markets sponsored by the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Farmers' Market Food and Nutrition Program (FMNP). The objectives of this cross-sectional study were to compare socio-demographics, food purchasing behaviors, and motivators for visiting a new WIC-based farmers' market among convenience samples of WIC FMNP participants (n = 124, 30%) and non-participants (n = 291, 70%) using a customer survey (n = 415). Frequency counts and percentages were obtained while independent t-tests and Chi-square were carried out to compare WIC FMNP participants to non-WIC participants ( $p \leq 0.05$ ). The age range of most (62%) of the visitors was 25–54 and the majority were female (91%). The primary motivators for market attendance included variety of F&V (76%), quality of F&V (55%), and to purchase food grown locally (59%). The majority of the total sample agreed (88%) that shopping at the WIC-based farmers' market increased their F&V consumption. WIC FMNP participants were further motivated by low prices (44%) and the ability to easily spend FMNP coupons (75%). Additionally, the study finds that location and convenience play a critical role in increasing FMNP coupon redemption rates.

**Keywords:** WIC FMNP | farmers' market | food access | motivators

### **Article:**

#### **Introduction**

Due to the growing awareness and demand by consumers for local sustainable agriculture, the number of farmers' markets in the United States is on the rise.<sup>1</sup> The United States Department of Agriculture (USDA) reported a 2.3% increase in farmers' markets from 2015–2016 alone, and there has been a 200% increase over the past 15 years.<sup>2</sup> 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."<sup>3</sup>

Farmers' markets provide an excellent opportunity for farmers to establish relationships with consumers, promote customer loyalty, and educate the public about local agriculture.<sup>3-5</sup> 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.<sup>6</sup> Moreover, the benefits extend beyond reduction in consumer prices. Fresh produce found at farmers' markets is known to be at the peak of nutrient density as compared to produce sold at grocery stores.<sup>7</sup> Research also indicates farmers' markets are important tools for promoting both the sustainability and long-term viability of local agriculture.<sup>1</sup>

Surveys of farmers' market consumers across the United States 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.<sup>4,8,9</sup> However, like access to healthy foods or full-sized grocery stores, farmers' markets are disproportionately found in middle- or high-income neighborhoods. Unsurprisingly, the demographics of farmers' market shoppers reflect their spatial distribution, as research indicates that the modal farmers' market shopper is female, white, well- educated, and has an above average income.<sup>8,9</sup> Conversely, low-income Americans face the greatest difficulty accessing farmers' markets.<sup>5,9,10</sup>

These access issues have been recognized by the USDA and several programs have been created to increase the access of low-income populations to fresh F&V. One important program for connecting these populations with fresh F&V is the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Farmers' Market Nutrition Program (FMNP).<sup>11-13</sup> The FMNP was established by Congress in 1992, and is administered by the USDA Food and Nutrition Services through grants to state-level agencies.<sup>14</sup> 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 Fiscal Year 2015, the program supplied fresh produce to more than 1.7 million WIC families, providing more than \$14 million in income for over 18,000 small farmers. To qualify for FMNP benefits, participants must be pregnant, breastfeeding, postpartum, or have children ages 3-5 years that are currently eligible to receive regular WIC benefits. Benefit levels vary by state. In North Carolina, FMNP coupons are valued at \$24 per participant (6 coupons × \$4 each) and are allocated once per season.<sup>15</sup>

A growing body of research indicates that the WIC program is effective. Participation in WIC FMNP is associated with improved access to F&V, increased F&V intake, and a greater likelihood of shopping at farmers' markets.<sup>6,12,16,17</sup> The National Association of Farmers' Market Nutrition Programs evaluated perceptions about WIC FMNP among participants (n= 24,800) and farmers (n= 2561) in 2002. Findings indicated that 42% of program participants had never previously shopped at 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 used.<sup>18</sup> Another survey of WIC FMNP participants revealed that 58.2% thought the quality of food at the farmers' market was better than at the grocery store. In terms of payment at the farmers' market, 51% percent indicated they spent their personal funds, 11.7% used Supplemental Nutrition Assistance Program (SNAP), and 10.7% used both, in addition to FMNP coupons.<sup>19</sup>

Despite the well-documented benefits of the FMNP program, redemption rates of the coupons have remained low. A few studies have examined existing barriers to farmers' market utilization among the WIC population or addressed low redemption rates.<sup>12,17,19,20</sup> The results of these studies have shown that the distance to farmers' markets is a major barrier for WIC

participants.<sup>17,19</sup> In addition to distance, research on farmers' markets has indicated that WIC participants experience additional barriers to market access, including lack of time to visit markets and insufficient access to farmers' market locations, all preventing recipients from redeeming FMNP coupons.<sup>19,21</sup>

Scholars have tested several promising strategies to address barriers to FMNP utilization, such as setting up farmers' markets in convenient locations, most notably in WIC clinic parking lots.<sup>22,23</sup> This study reports the findings of a survey conducted among both WIC FMNP participants and non-participants attending a new WIC-based market planned and implemented jointly by a WIC office and health department in an urban county in North Carolina. The farmer's market was targeted at WIC FMNP participants in order to provide an accessible location, greater access to locally grown fresh F&V, and to increase FMNP coupon redemption rates. An analysis of redemption data from the present study reported an 11.6 percentage point increase in FMNP coupon redemption rates.<sup>22</sup> Accordingly, the objectives of this study were to compare the sociodemographic characteristics, shopping behaviors, motivators/barriers for market attendance, and information sources of WIC FMNP participants and non-participants attending the new farmers' market. The market was held weekly on Thursdays from May to October 2013 for a total of 24 weeks, and featured a variety of locally grown produce sold by 12 WIC-approved farmers.

## **Methodology**

### **Study setting and participants**

The market site is located in Catawba County, North Carolina. Catawba County is in the western portion of the Piedmont region of the state and in 2010 had a population of approximately 150,000. Per the 2010 Census, the county was primarily White (87.1%) with 9.4% of the total population identifying as Hispanic. The median household income was approximately \$44,000 and 9.1% of the population were classified as below the poverty line.<sup>24</sup> The location of the WIC clinic is situated in an area that has a low-income population with low access to nutritious foods within a 10-mile radius even if using a vehicle.<sup>25</sup> The health department is situated between a hospital and the county's Department of Social Services. The WIC clinic parking lot served as the location of the farmers' market and Figure 1 provides a visual of the market location.

FMNP participants were the priority population to be served by the new market location. At the time of the study, 2120 WIC participants were eligible to receive FMNP coupons in Catawba County (NC Nutrition Services Branch, personal communication, 2013). FMNP participants in Catawba County received a benefit of \$24 in FMNP coupons (6 coupons valued at \$4 each) along with one Bonus Bucks coupon (\$4 value). A local business donated the funds to pay for the Bonus Bucks program. The Bonus Buck program increased the total FMNP benefit per participant for the 2013 season to \$28.

### **Farmers' markets survey development**

To meet the study objectives, individual, anonymous surveys were conducted with farmers' market visitors. The survey was designed and implemented in partnership with the local health department and WIC clinic. Initially, the survey was developed through an iterative and participatory process with the local health department staff. The survey was also partially based

on surveys previously conducted by the local health department, the State of North Carolina Nutrition Services Branch, and a farmers' market survey from a near by county. The survey was developed in both English and Spanish. The Spanish language survey was translated by a community health worker at the health department, and in turn verified by a second community health worker. An informed consent statement was included at the top of the survey and the University Institutional Review Board approved the final English and Spanish surveys along with data collection methods.

Surveys were collected on each market operation day from July to October 2013 for a total of 13 weeks. The collection period coincided with WIC FMNP coupon availability in the county. The two-page survey contained 16 multiple choice questions and 6 open-ended questions. Sections of the survey included: (1) socio-demographic information such as age, ethnicity, and zip code; (2) what attracted visitors to the market (e.g. advertisements, quality and variety of produce, convenience, and support of local farmers); (3) shopping behaviors including payment method, amount spent, and the variety of produce purchased in addition to produce consumption; and (4) perceived benefits of the market and suggestions for improvement.

Additionally, at the end of the survey, a section was included specifically for WIC FMNP participants. In this section, we collected information on the convenience of the farmers' market location, the ease of use of FMNP coupons, and solicited recommendations to improve the farmers' market for FMNP participants.



Figure 1. WIC-based farmers' market location.

Sampling and data collection

A prominently labeled space 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 if they would like to participate in the survey as they passed the information table or as they exited the farmers' market. Alternatively, some visitors were approached directly by the research team as they shopped at the farmers' market, and asked to complete the survey once they finished shopping. A total of 415 surveys were collected over the course of 13 weeks. In order to ensure an adequate sample of WIC clients, surveys were administered on a weekly basis when WIC FMNP coupons were available in the county. Overall, the only selection criteria employed for administering the survey was that individuals must be 18 years of age or older, a visitor to the farmers' market, and had not previously completed the survey.

Upon completion of the survey, a free farmers' market tote bag was provided to the participant. Furthermore, survey respondents were eligible to enter a drawing for a \$250.00 gift card redeemable at a local grocery store chain. The respondents who opted to participate in the drawing were asked to provide their first name and a telephone number or e-mail address. The winner of the drawing was selected during the last farmers' market, and contacted directly by the lead researcher.

## Data analysis

The survey responses were coded with numeric values (e.g. yes = 1; no = 2). To ensure the accuracy of the data, figures were entered by a member of the research team and then verified independently by two additional team members. The data were then analyzed using Microsoft Excel and IBM SPSS version 19.0 software. Descriptive frequencies were compiled from the study population to describe the socio-demographic profile and to understand farmers' market purchasing behaviors. 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 participants to non-WIC participants. The associations were considered significant when the p-value was 0.05 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, 30% (n= 124) reported receiving WIC FMNP. The socio-demographic profile indicated that age range of most (62%) of the visitors was 25–54. Among the visitors, the majority were female (91%) and non-Hispanic white (75%). When comparing the two groups we found that most WIC affiliated visitors were between the ages of 18–34 while the majority of non-WIC participants were older than 34 years. Age was significantly different between WIC participants and non-WIC participants  $X^2(4, n= 398) = 139.05, p < 0.0001$ , as well as ethnicity  $X^2(3, n= 398) = 13.7, p = 0.0033$ . The majority of visitors were either WIC clients (32%) or community members who lived or worked within five miles of the health department (29%). This includes clients, patients, and employees of the local health

department, Department of Social Services, and a regional hospital located adjacent to the market.

### Motivators for attending the WIC farmers' market

Approximately 60% of survey respondents (n= 207) were first time visitors to the market. Of those who had previously visited the market, the greatest number of visits 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 participants came to the market. A significant difference emerged between the mean number of times non-WIC participants (M= 2.81, 95% CI  $\pm$  0.39) came to the market versus WIC FMNP participants (M= 1.59, 95% CI  $\pm$  0.26);  $t(339) = 3.92$ ,  $p < 0.0001$ .

Visitors learned about the market primarily from the WIC clinic (35%) and advertisements in the community (56%). These advertisements included road signs near the market, bus advertisements, flyers, brochures, and bill- boards. The most frequently mentioned advertisements were road signs (30%). Another 25% heard of the market via word of mouth. Shoppers were also asked why they came to the farmers' market; multiple responses were accepted. The main motivators or enablers for coming to the farmers' market were the variety of fresh F&V (76%), the ability to purchase food grown locally (59%), the quality of the fresh F&V (55%), to support local farmers (42%), and low prices (40%). However, among the WIC FMNP participants, low prices (44%) and the ability to easily redeem WIC FMNP coupons (75%) were more of a motivation than to support local farmers (35%). WIC FMNP participants also indicated that setting up the market in a WIC clinic parking lot saved them time (48%), was convenient (32%), and decreased the distance they had to travel to get to a market (29%). Furthermore, WIC FMNP participants specified that the additional one- time \$4 Bonus Buck incentive provided at the WIC clinic allowed them to buy extra produce (64%), attend the WIC farmers' market for the first time (36%), and try a new fruit or vegetable (21%).

### Farmers' market shopping behaviors by WIC FMNP participants and non-participants

Visitors used a variety of payment methods including cash, WIC FMNP coupons, and Bonus Bucks. A few vendors also accepted credit cards and personal checks though SNAP Electronic Benefit Transfer (EBT) was not accepted for the 2013 season. Cash (74%) was the most frequent method of payment. However, the principle payment methods among the WIC FMNP participants were WIC FMNP coupons (79%) and Bonus Bucks (48%), while cash was less frequently used (24%). When asked both formally and informally about how the market could improve, many visitors suggested that the market should include SNAP EBT as an accepted form of payment. These responses encouraged the market manager to follow this suggestion and accept SNAP EBT payment beginning the following season.

The majority (65%) of WIC FMNP participants were spending their coupons for the first time. Among first-time shoppers, 81% spent their coupons at the WIC farmers' market, while the remainder spent their coupons at the farmers' markets in surrounding communities. The average amount spent at the WIC farmers' market in one day was \$10.00 with a range of \$1.00 to \$40.00. There was a significant difference in the amount of money spent by non-WIC participants as compared to WIC FMNP participants. WIC FMNP participants (M= 16.67, 95% CI  $\pm$  1.60) spent more money (including cash + FMNP coupons) than non-WIC participants (M= 13.39, 95% CI  $\pm$

0.92);  $t(452) = -3.51, p = 0.0002$ . WIC participants attended the market because it was “easy to use FMNP coupons” and this may have contributed to their spending. When visitors to the market were asked to rate how strongly they agreed or disagreed with the statement: “The prices at this farmers’ market are less expensive than the grocery store where I usually shop,” the majority (72%) of visitors agreed or strongly agreed with the statement, with WIC FMNP participants selecting “strongly agree” more frequently (40%) than non-participants (23%).

Variety was an important motivator for WIC FMNP participants to attend the market. WIC FMNP participants purchased over twenty different types of F&V. Visitors were asked to indicate which F&V they had purchased on that market day. The most frequently purchased item was tomatoes (61%), followed by squash (32%), bell pepper (21%), and white potato (20%). Among the less frequently purchased vegetables were sweet potatoes (10%), lettuce (6%), greens (5%), hot peppers (5%), and broccoli (3%). The most frequently purchased fruits were peaches (28%) and berries (28%). Additional fruits were also available, including several varieties of grapes, cantaloupe, apples, 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. Most of the suggestions were seasonally grown F&V with a limited window of availability including strawberries, corn, and okra. Interestingly, numerous suggestions were fruits that were not grown in the region such as bananas and mangoes. When the WIC FMNP participants and non-participants were asked to rate how strongly they agreed or disagreed with the statement: “This farmers’ market helps me to increase the amount of fresh fruits and vegetables my family eats,” 88% of visitors agreed, and of those, 44% strongly agreed. Almost all (95%) of WIC FMNP participants agreed with the statement.

## Discussion and conclusions

Our results indicate that locating a farmers’ market at the clinic assisted WIC FMNP participants in redeeming coupons and improved intake of the variety of F&V. The primary motivators among WIC FMNP participants were access to a variety of fresh F&V and the ability to conveniently spend WIC FMNP coupons. Overall, we found the quality of fresh F&V drew more visitors to the market than the prices of fresh F&V. These findings are similar to those of other investigators who reported that motivators to attend farmers’ markets include the opportunity to buy produce in season, purchase high quality F&V, and to support local farmers.<sup>4,26-28</sup>

More coupons were redeemed at the WIC FMNP market than at other markets in the county, despite the modest size and limited operating hours of the market. Moreover, some WIC FMNP participants in this study also continued shopping at the farmers’ market once they had exhausted their supply of coupons. Sales data for FMNP coupons were tracked, and revealed that 48.1% of the total FMNP coupons issued in the county were spent at the WIC clinic market.<sup>22</sup> These results strongly indicate that the new market location proved the most convenient among WIC FMNP participants.

Convenience and freshness were not the only reasons that people indicated for why they attended the market. Over 40% of shoppers indicated they attended the market because of low prices for fresh F&V. Furthermore, shoppers perceived prices at farmers’ markets to be less expensive than grocery stores. WIC FMNP participants agreed with this sentiment at a higher rate than non-WIC participants (80%). These perceptions are supported by recent scholarship. A comparison of F&V prices at farmers’ markets and supermarkets in 12 North Carolina counties revealed a cost savings of over 17% for produce at farmers’ markets.<sup>29</sup> This finding

along with our own illustrates how increasing access to farmers' markets can make F&V more affordable to low-income groups.

Although the market was successful in increasing FMNP participants' access to fresh F&V, there were aspects of the market that the staff, vendors, and market attendees thought could be improved. For example, the inclusion of SNAP EBT as an accepted form of payment was frequently suggested. The desire to use EBT benefits at the market was not surprising as there is a significant overlap between SNAP EBT and WIC usage.<sup>30,31</sup> Two additional studies support this suggestion, as the inability to use SNAP EBT was commonly cited as a barrier to farmers' market visitation among low-income participants.<sup>28,32</sup> It is important to note, the expansion of payment methods not only improves access for low-income visitors to the market but also can be a boon to farmers. As studies suggest, accepting additional forms of payment benefit farmers by allowing them to expand their client base and revenue.<sup>33</sup> Several studies have also suggested that conducting outreach to both the WIC and SNAP populations along with disseminating information in the community about farmers' market hours and accepted forms of payment is needed.<sup>5,12,34</sup>

Our study highlights the willingness of low-income Americans to shop at farmers' markets provided with the proper conditions. Crucially, we find that making markets more convenient for FMNP participants, in terms of location and hours of operation can significantly improve FMNP coupon redemption<sup>22</sup> and thereby F&V consumption in low-income households. We hope this study provides a model, by relaying important information on how minimizing barriers to farmers' markets can assist WIC clients to fruitfully spend their FMNP coupons.

Additionally, we found that there is a 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 locally, or were unavailable due to seasonality. Also, notably, we found that participants desired more knowledge of proper preparation techniques for many of the F&V offered at the market. Fortunately, a market, such as the one in this study, is ideally located to educate participants on both preparation and seasonal availability of local produce. For example, markets could organize cooking demonstrations involving a partnership with Cooperative Extension. Markets located near local government services, such as the one in this study, potentially have access to large number of underutilized governmental resources. By concentrating these resources in single locations, hopefully we can help overcome numerous barriers currently inhibiting farmers' market usage among low-income individuals.

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