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## Low-income individuals' perceptions about fruit and vegetable access programs: A qualitative study

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### Abstract

**Objective**—To examine how fruit and vegetable (F&V) programs address barriers to F&V access and consumption as perceived by low-income individuals.

**Design**—From 2011–2012 thirteen focus groups were used to better understand low-income individuals' perceptions about F&V programs.

**Setting**—Five North Carolina counties at community-serving organizations.

**Participants**—Low-income participants ages 18 or older were included in the study. A majority were African American females with a high school education or less and received government assistance.

**Phenomenon of Interest**—Low-income individuals' perceptions about how F&V access programs can reduce barriers and increase consumption.

**Analysis**—A socioecological framework guided data analysis, and 2 trained researchers coded transcripts, identified major themes, and summarized findings.

**Results**—A total of 105 participants discussed that mobile markets could overcome barriers such as availability, convenience, transportation, and quality/variety. Some were worried about safety in higher crime communities. Participants' opinions about how successful food assistance programs were at overcoming cost barriers were mixed. Participants agreed that community

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gardens could increase access to affordable, conveniently located produce, but worried about feasibility/implementation issues.

**Implications for Research and Practice**—Addressing access barriers through F&V programs could improve consumption. Programs have the potential to be successful if they address multiple access barriers. (200 words).

### Keywords

Food access; focus group; low-income; fruit; vegetable

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## INTRODUCTION

Mobile markets, farmers' markets accepting food assistance benefits, and community gardens are all strategies to improve access to – and consumption of – fruits and vegetables (F&V). Consumption of healthy foods, including F&V, can help reduce the risk of chronic diseases, including heart disease, diabetes, and some cancers.<sup>1</sup> Unfortunately, most individuals, especially those with lower incomes, do not consume the recommended amount of F&V per day.<sup>2,3</sup> One reason low-income individuals struggle to meet these standards is because they experience unique barriers to accessing and consuming F&V.<sup>2</sup> These barriers can include distance to food stores, lack of transportation, cost, convenience of preparing F&V, and poor quality F&V.<sup>4</sup>

Mobile markets can reduce transportation barriers to F&V as they often locate in convenient places for low-income individuals to shop. The Supplemental Nutrition Assistance Program (SNAP), a federal needs-based program, helps low-income families and individuals purchase food. At some farmers' markets, SNAP recipients can use Electronic Benefit Transfer (EBT) cards, similar to a debit card, to purchase produce. Electronic benefit cards reduce the stigma associated with SNAP by making it look like a debit card instead of the traditional paper-based food voucher.<sup>5</sup> These cards are supposed to make farmers' markets more accessible for recipients since they can use SNAP benefits to purchase local produce. However, not all farmers' market vendors have EBT terminals to process transactions. A more recent strategy to improve F&V access and consumption is community gardens – shared spaces for neighbors to grow fresh produce. Neighbors can benefit from gardens placed directly in their community as they are easily accessible and affordable. However, implementing community gardens has been a challenging process for some lower-income communities.<sup>6</sup>

Few studies have examined low-income individuals' perceptions about whether mobile markets, EBT at farmers' markets, and community gardens reduce access barriers and/or improve consumption. Therefore, the purpose of this study was to examine the relative strengths and weaknesses of mobile markets, EBT at farmers' markets, and community gardens as perceived by low-income individuals. Understanding low-income individuals' perceptions can help identify opportunities that can be used to strengthen F&V strategies and improve program acceptability and implementation.

## Methods

### Study Setting

In 2010, North Carolina was listed as one of the top 10 agricultural producing states in the country<sup>7</sup> yet it also ranked in the top 10 for food insecurity<sup>8</sup>, thus making it a useful study setting. Focus groups were conducted across five NC counties (see Table 1). These counties were selected to help ensure geographical representation from the state's three agricultural regions – the coastal plains, Piedmont, and mountains. All counties were a mix of urban and suburban communities. Predominantly rural communities were not included due to difficulties of arranging easily accessible focus groups for all participants.

### Study Design

Focus groups were used to describe low-income individuals' perceptions about F&V access strategies and how they can reduce barriers. The focus groups encouraged participants to present and defend their views to others in the group.<sup>9</sup> They also offered researchers the opportunity to learn about issues from those directly affected. Focus groups took place at locations convenient for participants. Thirteen focus groups were conducted with 6–10 low-income individuals per group between 2011 and 2012. Prior to the start of each focus group, participants provided informed consent and completed a demographic survey. Focus groups lasted approximately 60 minutes. Participants were compensated with a \$25 gift card. All groups were moderated and digitally recorded by a trained qualitative researcher (LHM). This study was approved by the University of North Carolina Institutional Review Board.

### Moderator Guide

Recognizing that many factors influenced F&V access and consumption, the socio-ecological framework (SEF) informed the development of the moderator guide, with the understanding that multiple factors might affect perceptions of F&V access. The SEF suggested that various individual, inter-personal, community, and public policy-level factors interact with each other to influence F&V access, and in turn, consumption.<sup>11</sup> Questions were written to elicit discussions about purchasing produce from mobile markets; usability of EBT at farmers' markets; interest in community gardens; and additional strategies for improving F&V access. The moderator guide was tested in a pilot focus group with 6 participants in a low-income housing site to ensure that questions were appropriately worded.

### Recruitment

Participants were recruited with the help of staff at 11 community-serving organizations that provided services to, and/or advocated for low-income individuals. Staff were asked to (1) provide information about the dietary concerns of people served by their organization; (2) recruit low-income individuals willing to participate in focus groups; and (3) facilitate scheduling of focus groups. Staff used word-of-mouth and flyers to disseminate study information to potential focus group participants. Researchers asked staff to recruit 10–12 individuals for each focus group in anticipation of a 30% no-show rate.<sup>9</sup> The goal for the

study's total sample size was to continue conducting focus groups until no new thematic information was revealed (i.e., data saturation).<sup>10</sup>

## Data Analysis

Analysis involved three phases: coding, within-group analysis, and between-group analysis. Focus group data were transcribed verbatim and analyzed using Atlas.ti 7.0 (Atlas.ti Scientific Software Development, Berlin Germany). A general inductive approach was used to identify focus group themes. This allowed researchers to capture themes that might be overlooked if they had used an established codebook.<sup>12</sup> The SEF guided data analysis, with the understanding that multiple levels of influence might affect perceptions of F&V access, including personal food preferences (individual-level factors), food environment barriers to F&V (community-level factors), and the role of EBT cards in promoting F&V access (policy-level factors).

To improve the study's rigor, a second coder (LA) helped with coding. In the initial coding phase, the lead author (LHM) and the second coder (LA) independently applied open coding to two transcripts to identify main topics. Researchers compared open codes, reconciled discrepancies through discussions, and created a final code book. The final codebook was applied to all focus groups. To ensure inter-rater reliability, any code discrepancies were discussed until consensus was reached.<sup>10</sup>

Code frequency (i.e., how often a code appeared in a transcript) and code correlation (i.e., which codes were likely to appear in the same sentence or topic) for each focus group were used to identify patterns and themes. These themes were compared within each group (within-analysis) and between-group analysis was used to determine whether themes were consistent across focus groups. After within- and between- analysis, the researchers concluded that data saturation was reached because of the lack of new and/or original ideas.

## Results

Table 1 includes the focus group demographics. Most participants were African American (71%), women (74%), with a high school education or less (53%). The majority of participants (71%) had an annual household income of less than \$20,000. More than half received SNAP benefits or other government assistance. Most participants had 2 to 3 adults (61%) and 0 children (53%) living in their household. Across the 13 focus groups, participants discussed barriers to accessing F&V. They also discussed how mobile markets, EBT at farmers' markets, and community gardens addressed access barriers, as well as introduced new barriers or unintended consequences (see Table 2). Each topic is described below.

### Barriers to Fresh Fruits and Vegetables

Table 2 lists the top 10 barriers to purchasing F&V based on the number of times the barrier was referenced and the number of focus groups that referenced it. These barriers (listed in order of frequency) were: cost, cooking and nutrition knowledge, convenience, quality, personal food preferences, availability, transportation, perishability, variety, and safety. (A

more in-depth discussion of F&V access barriers among the focus group participants is described elsewhere in another study.<sup>4)</sup>

### Mobile Markets

**Community-Level Barriers Addressed**—Mobile markets, such as farmers' markets and food trucks, were described to participants as alternate food outlets that would travel directly to their neighborhoods, schools, or community organizations selling F&V. Generally, the idea of mobile markets was well-received. Transportation was a concern for participants who did not own cars; thus, having markets come to convenient locations would make it easier to purchase F&V by addressing community-level geographic barriers (see Table 3).

In terms of how the mobile market would work in their community, a majority of focus groups discussed the need for it to be easily accessible with respect to location and hours of operation. Most participants felt that operating at the same time each week was crucial for accessibility. However, participants working nights and weekends argued that having flexible hours would allow more people to shop at these markets. Supplemental Nutrition Assistance Program recipients stressed the importance of having mobile markets that accept SNAP. All participants agreed that mobile market produce needed to be high quality and fresh—unlike donated produce from organizations that many were used to receiving. As one woman commented, “*We don't want them to bring no leftovers.*”

Good customer service, trusting vendors, building relationships with vendors/farmers, and having tips for storing and cooking produce would increase the likelihood of people shopping at mobile markets. The feeling of not being labeled a ‘low-income’ customer was very important to participants across the majority of focus groups. As one participant said, “*We don't want them to come through our neighborhood because we are low income realty.*” Other participants commented that having information available at farmers' markets about how to select, properly store, and cook with produce would be helpful. This suggestion was discussed more frequently among younger participants than older ones.

**Individual- and Community-Level Barriers Not Addressed**—While many barriers could be addressed using mobile markets (availability, convenience, quality, variety, and transportation), participants brought up issues that might arise due to mobile markets in their community. Many participants were skeptical that mobile markets would sell affordable produce, as they often compared mobile markets to farmers' markets, which participants perceived as ‘expensive’. Additionally, after purchasing produce from a mobile market, participants were still concerned about perishability. Younger participants wondered if vendors/farmers could show them how to extend the shelf life of produce. The topic of having vendors/farmers show or teach focus group participants how to use the produce came up frequently with younger individuals since many were unsure of how to prepare certain produce. Additionally, some participants were hesitant about the taste of F&V from the markets, as one woman commented, “*Where I grew up, everything's from the store, so fresh food tastes funny to me.*”

**Community-Level Barriers Introduced**—Several focus groups talked about how mobile markets could possibly introduce new barriers to F&V access. Community safety was a concern for focus groups in higher crime neighborhoods. Participants were worried about cash-on-hand that market vendors and customers might be carrying, as participants felt this was an opportunity for robberies or pick-pocketing. Participants in focus groups from higher crime areas seemed to be much more concerned about safety than other focus groups.

### Food Assistance Programs at Farmers' Markets

**Community-Level Barriers Addressed**—Almost 60% of focus group participants received SNAP benefits. When asked how much interest participants would have in farmers' markets that accepted EBT, half of participants said that they would be more likely to shop there. Yet, when discussing strategies for purchasing F&V in the community, most participants said EBT acceptance would be an important component of any program.

**Individual-, Community- and Policy-Level Barriers Not Addressed**—There were mixed opinions among focus group participants about whether EBT at farmers' markets would reduce the cost burden of purchasing F&V. Many participants talked about their monthly food budgets and while some felt that EBT at farmers' markets was a good idea, others questioned how far they could stretch their monthly SNAP benefits purchasing fresh produce there (see Table 4). There was an overall perception that farmers' market produce was more expensive than produce sold in grocery stores or supermarkets.

Some participants felt they could not afford to shop at farmers' markets – especially those with the lowest household incomes. When asked why they did not shop at farmers' markets, one woman responded, *“I'm sure everybody that receives EBT would if it was affordable; I would give it a try if it was affordable because I like fresh fruits and vegetables.”* Even after one farmers' market began accepting EBT several women perceived the price of F&Vs to be so high it was not worth their time to shop there. Regardless of whether farmers' markets accepted EBT, participants in several focus groups felt they were not geographically close enough to purchase produce from a farmer's market. One participant commented that all the 'good produce' was at the downtown farmers' market, which was not easily accessible. Participants also noted that EBT would not address other issues, including cooking and nutrition knowledge, personal food preferences and perishability and safety.

**Individual-Level Barriers Introduced**—Older participants felt there was a stigma associated with using EBT at farmers' markets. While EBT cards looked like debit cards, they had to be swiped in a USDA authorized terminal, thus requiring EBT recipients to ask the vendor if they accepted EBT. When asked what would be a reason people would not use their EBT at farmers' markets, one woman responded that some people were embarrassed. As one elderly woman commented about her recent experience at the farmers' market: *“I just always go to the vendor and ask, ‘Do you take this?’ which is kind of creepy...But, it's better than having them fill up the bag and then say they can't take it.”*

## Community Gardens

**Individual- and Community-Level Barriers Addressed**—In general, community gardens were thought of as a convenient method for getting more community members involved in healthy behaviors, including physical activity and improved mental health. As one participant commented, *“It’s therapeutic for some people to work in gardens.”* Additionally, gardens were seen as an affordable strategy to obtain wide variety of fruits and vegetables.

When asked how to get more people involved in the community garden, most mentioned ‘knowledge’ as being the solution, such as making more people in the community aware of the garden, promoting it in the neighborhood, and teaching gardening skills (see Table 4). Many of the older focus group participants were more knowledgeable about gardening than the younger participants. Younger participants agreed that it would be helpful to have gardening lessons or workshops to prepare them for working in the community garden.

**Previous Community Garden Experience**—Four of the 13 focus groups included participants with previous community garden experience. Two of the focus groups with active community gardens in their neighborhoods had more positive feedback than the two focus groups with inactive gardens. A participant in one of the focus groups with an inactive garden commented, *“It’s not been kept up and it’s not - it just doesn’t look like it should.”* Another woman felt that the space dedicated to the community garden was too small and it was difficult for multiple people to work in the garden simultaneously.

The more active community gardens had dedicated community members to oversee, coordinate, and work in the garden. In another community garden, two of the eight focus group participants were garden organizers. They helped coordinate planting and harvesting days. A majority of the focus group participants had tasted F&V from the garden and felt the produce’s taste was superior to what they could purchase in the grocery store. Additionally, many participants emphasized that community gardens helped overcome convenience barriers. Participants discussed the benefits of having the opportunity to walk to the garden, select what they needed, and cook with it in meals.

**Community-Level Barriers Introduced**—Although participants mentioned that community gardens could address barriers to F&V access (availability, cost, transportation, quality and variety) many expressed concerns about the logistics. Participants also felt that community gardens would be more successful if community members were involved in the garden (not just the organizations developing them). In multiple focus group discussions, it became clear that participants wanted a guarantee that they could harvest F&Vs after all the front-end work. Many participants said they would be skeptical of a community garden unless it was stated up front what produce they were ‘getting out of it’ and how much. One participant commented, *“What would be the benefits for working in this garden? Suppose you work in this garden and you end up with a half a bushel of potatoes and a couple carrots?”*

Many participants in the focus groups were worried about the possibility of new barriers being introduced as the result of the community gardens. Safety issues were raised

frequently among focus groups in higher crime areas. One participant described a recent vandalism experience of a church community garden close to them. Just as with the mobile markets, some participants were afraid that community gardens would attract unwanted negative attention to their neighborhood.

## Discussion

Many low-income individuals experience barriers to accessing and consuming F&Vs.<sup>2</sup> To address access and consumption issues mobile markets, EBT at farmers' markets, and community gardens are supposed to overcome specific barriers. Among these three strategies, mobile markets received the most positive comments with the least amount of barriers.

According to participants, mobile markets can be used to overcome community-level barriers such as availability of F&V, convenience of purchasing/preparing F&V, transportation, and produce quality and variety. These results mirror findings from a recent survey among lower-income individuals across 14 NC counties in which participants endorsed the idea of having a mobile market to increase F&V consumption.<sup>13</sup> Recent studies have begun to examine the effectiveness of mobile markets in low-income communities. In a study involving the *Veggie Mobile*, a van that sells discounted produce in low-income senior housing sites in New York, researchers found that participants increased their F&V intake after shopping at the *Veggie Mobile*.<sup>14</sup> Going forward, mobile markets should consider options for addressing safety issues, such as not having large amounts of cash-on-hand, having a safety officer, or locating markets in highly visible and well-lit sites.

When discussing EBT at farmers' markets, there were mixed opinions among focus group participants about how successful EBT cards would be in overcoming community-level cost barriers. Even with food assistance benefits, some participants felt they lacked the appropriate funds to overcome the SNAP monthly allowance – a policy-level barrier for purchasing F&V at farmers' markets. However, when discussing strategies for purchasing F&V in the community, most participants said their participation would be contingent on EBT acceptance. While research surrounding EBT acceptance at farmers' markets is limited, some studies show promising results. In a 2008 pilot project involving a Philadelphia farmer's market, researchers found that after farmers began accepting EBT, redemptions from the SNAP program increased 33% in one season.<sup>15</sup> Similarly, after EBT implementation at 23 of New York City's 49 farmers' markets, redemptions doubled from 2008 to 2009.<sup>16</sup> One new barrier that participants discussed surrounding EBT cards was the stigma associated with using the card. EBT cards require vendors using credit card terminals to confirm with the customer what type of card it is (Credit/Debit/EBT). Additionally, not all farmers accept EBT and some participants are embarrassed about inquiring about farmer's transactional practices.

Among the three F&V access strategies, community gardens had the greatest uncertainty, mostly related to feasibility and implementation. While the concept of community gardens is not new<sup>17</sup>, its use in lower-income communities is more recent. Previous studies have shown community gardens can increase F&V consumption. A study involving 766 urban

adults revealed that individuals with household members participating in community gardens consumed F&V more frequently than individuals whose household did not participate (4.4 servings versus 3.3 servings daily).<sup>18</sup> In a small cross-sectional survey involving community garden participants in eastern Washington, more than half of the participants reported an increase in F&V consumption while participating in the garden. Additionally, 80% of the gardeners said they used the community garden to stretch their food dollars.<sup>19</sup>

In this study, while participants agreed that community gardens could be a great place for accessing fresh, affordable, conveniently located produce, they worried that their neighborhoods would not be the best fit. There was great concern regarding the issue of community safety. Fears of vandalism were brought up multiple times. However, one positive outcome resulting from gardens can be community development. Community gardens can lead to civic engagement, neighborhood beautification, and relationship building – all which could potentially alleviate fears about garden safety.<sup>20</sup> One important factor that was attributed to the successful implementation of community gardens was having a “community champion”, an individual from the community that supports the garden and encourages others to participate as well. This is consistent with another study that showed community gardens were more likely to succeed when they involved the community using a “bottom-up” approach.<sup>21</sup>

### Limitations

Several limitations exist in this study. First, the small sample size and narrow geographic location limits generalizability of the findings. This study focuses only on urban/suburban communities in NC. Rural communities might experience F&V access barriers that differ from other communities. Additionally, individuals living in other states might endure food access and consumption issues that are unique to their state or region.

### Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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### References

1. Centers for Disease Control and Prevention (CDC). [accessed January 20, 2015] Chronic diseases: The power to prevent, the call to control: At a glance. 2009. Online at <http://www.cdc.gov/chronicdisease/resources/publications/AAG/pdf/chronic.pdf>
2. Lin B. Diet quality usually varies by income status. *US Amber Waves*. 2005; 3(4):4–5.

3. Centers for Disease Control and Prevention (CDC). State-specific trends in fruit and vegetable consumption among adults - United States, 2000–2009. *MMWR Morb Mortal Wkly Rep.* 2010; 59(35):1125–1130. [PubMed: 20829745]
4. Haynes-Maslow L, Parsons SE, Wheeler SB, Leone LA. Understanding barriers to fruit and vegetable consumption among low-income individuals: A qualitative study. *Prev Chronic Dis.* 2013; 10:1202–06.
5. Bertmann FMW, Barroso C, Ohri-Vachaspati P, Hampi JS, Sell K, Wharton CM. WIC cash value voucher (CVV) use in Arizona: A qualitative exploration of barriers and strategies related to fruit and vegetable purchases. *JNEB.* 2014; 46(3):S53–S58.
6. Castro DC, Samuels M, Harman AE. Growing healthy kids: A community-based obesity prevention program. *Am J Prev Med.* 2013; 44(3S3):S193–99. [PubMed: 23415183]
7. NC Division of Agriculture and Consumer Services. *Agricultural Statistics - 2010 Annual Statistics Book.* 2010.
8. Food Research and Action Center. *Food hardship in America - 2010: Data for the nation, states, 100 MSAs, and every congressional district.* 2011.
9. Bloor, M.; Frankland, J.; Thomas, M.; Robson, K. *Focus groups in social research.* London: Sage; 2001.
10. Strauss, ACJ. *Basics of qualitative research: Techniques and procedures for developing grounded theory.* Thousand Oaks, CA: Sage; 1998.
11. Sallis, JF.; Owen, N.; Fisher, EB. Chapter 20: Ecological models of health behavior. In: Glanz, K.; Rimer, BK.; Viswanath, K., editors. *Health behavior and health education: Theory, research and practice.* 4. Joesy-Bass; 2008.
12. Finfgeld-Connet D. Use of content analysis to conduct knowledge-building and theory-generating qualitative systematic reviews. *Qualitative Research.* 2013; 0(0):1–12.
13. Leone LA, Beth D, Ickes S, MacGuire K, Nelson E, Smith RA, et al. Attitudes towards fruit and vegetable consumption and farmers' market usage among low-income North Carolinians. *JHEN.* 2012; 7(1):64–76.
14. Abusabha R, Namjoshi D, Klein A. Increasing access and affordability of produce improves perceived consumption of vegetables in low-income seniors. *J Am Diet Assoc.* 2011; 111:1549–55. [PubMed: 21963022]
15. Young C, Karpyn A, Uy N, Wich K, Glyn J. Farmers' markets in low income communities: Impact of community environment, food programs and public policy. *Community Development.* 2011; 42(2):208–20.
16. Council of the City of New York. Office of Communications. More low income New Yorkers accessing healthy foods: Council funding of EBT machines shows huge gains at the city's greenmarkets. New York, NY: 2009. [http://council.nyc.gov/html/pr/ebt\\_11\\_22\\_09.shtml](http://council.nyc.gov/html/pr/ebt_11_22_09.shtml)
17. Pennsylvania Horticultural Society. [Accessed January 28, 2015] Community gardens of the 21st century. Growing for the future. Strategies for a green city. Pennsylvania Horticultural Society website. [www.Pennsylvaniahorticulturalsociety.org/phlgreen/community21stcent.pdf](http://www.Pennsylvaniahorticulturalsociety.org/phlgreen/community21stcent.pdf)
18. Alaimo K, Packnett E, Miles RA, Kruger DJ. Fruit and vegetable intake among urban community gardeners. *J Nutr Educ Behav.* 2008; 40:94–101. [PubMed: 18314085]
19. Johnson DBSL. Testing the recommendations of the Washington state nutrition and physical activity plan: The Moses Lake case study. *Prev Chronic Dis.* 2006; 3:A64. [PubMed: 16539805]
20. McCormack LA, Laska MN, Larson NI, Story M. Review of nutritional implications of farmers' markets and community gardens: A call for evaluation and research efforts. *J Am Diet Assoc.* 2010; 110:399–408. [PubMed: 20184990]
21. Corrigan MP. Growing what you eat: Developing community gardens in Baltimore, Maryland. *Applied Geography.* 2011; 31:1232–1241.

## Appendix 1: Focus Group Moderator Guide

1. Are you able to buy and prepare as many F&V as you would like for yourself or your family?

- a. What makes it harder?
  - b. What would make it easier?
2. Where do you most often buy fresh F&V?
  - a. Why do you buy F&V at this location?
  - b. What is most important to you when choosing F&V?
3. Would you like to see more options in your community for purchasing fresh F&V?
  - a. What types of programs would help you to eat more F&V?
1. A farmers' market is a group of farmers and producers who sell fresh fruits, vegetables and other food directly to consumers. Last year they started accepting EBT cards. How much interest would the people in your community have in purchasing F&V at the farmer's market?

**Probe:** Why would they like it? Why would they not like it?

  - a. What would make it more likely for people to use the farmer's market?
2. In addition to the farmer's market some people have suggested the idea of a **Veggie Van** that would deliver bags of fresh, local F&V to community organizations such as [*your organization*]. Each week there would be different F&V, but everyone who gets a bag would get the same thing. How much interest would the people in your community have in a Veggie Van?

**Probe:** Why would they like it? Why would they not like it?

  - a. What would make it more likely for people to use the Veggie Van?
3. Community gardens provide shared space for people to grow fruits and vegetables.
  - a. Does your neighborhood have a community garden? If so, do you use it? Why or why not?
  - b. How much interest would people in your community have in using a community garden?
  - c. What would make it more likely for people to use the community garden?
4. Are there other ideas that you have for helping people to eat more produce?
5. What is the best way to promote F&V programs in your community?

### IMPLICATIONS FOR RESEARCH AND PRACTICE

Improving access to and consumption of healthy foods, including F&V, is important in promoting the health of low-income communities. Although several studies have examined the impact of mobile markets<sup>14</sup>, EBT at farmers' markets<sup>15-16</sup>, and community gardens<sup>18-19</sup>, research focusing on low-income individuals' perceptions about these programs is still lacking. Strategies to address access to F&Vs are most likely to succeed when they simultaneously address multiple access barriers. Lower-income individuals can offer suggestions to help mitigate barriers that may not be addressed by one single strategy, such as lack of cooking and nutrition knowledge, cost, stigma, and customer safety. Engaging with community members before implementing strategies should not be overlooked, as collaboration during the development phase may offer insight into how strategies can work best. Future research should examine the impact of bottom-up approaches to addressing access barriers in the community.

**Table 1**

Site-Specific Focus Group Characteristics: Geographic Region, County, Site Location, and Number of Participants

Geographic Region	County	Site Location	Participants (#)
Mountains	Buncombe	Resident Council Office	6
Mountains	Buncombe	Church	5
Mountains	Buncombe	Community Center	8
Piedmont	Durham	Community Center	6
Piedmont	Durham	Recovery Shelter	10
Piedmont	Durham	Small Grocery Store	9
Piedmont	Durham	Latino Resource Center	8
Piedmont	Guilford	Church	7
Piedmont	Orange	Senior Center	11
Piedmont	Orange	Senior Center	10
Piedmont	Orange	Family Resource Center	6
Piedmont	Orange	Family Resource Center	8
Coastal	New Hanover	Community Center	7

**Table 2**

Demographic Characteristics for Low-Income Focus Group Participants in North Carolina (N = 105)

Characteristic	n (%) <sup>a</sup>
<i>Sex</i>	
Male	27 (25.7)
Female	78 (74.3)
<i>Age</i>	
19–39	36 (34.3)
40–59	41 (39.1)
60	23 (21.9)
NR <sup>b</sup>	5 (4.8)
<i>Adults living in household (not including self)</i>	
0	17 (16.2)
1–2	64 (60.9)
3–4	11 (10.5)
5	4 (4.8)
NR	9 (8.6)
<i>Children living in household</i>	
0	56 (53.3)
1–2	31 (29.5)
3–4	14 (13.3)
5	1 (0.95)
NR	3 (2.9)
<i>Education</i>	
Less than high school	23 (21.9)
High school/GED	33 (31.4)
Some college	31 (29.5)
College graduate	11 (10.5)
More than college	7 (6.7)
<i>Marital Status</i>	
Never been married	38 (36.2)
Married/living with partner	36 (34.3)
Divorced	21 (20)
Widowed	9 (8.6)
NR	1 (1.0)
<i>Household Income</i>	
\$10,000	50 (47.6)
\$10,000–\$29,999	34 (32.4)
\$30,000 – \$49,999	9 (8.6)

Characteristic	n (%) <sup>a</sup>
\$50,000	3 (2.9)
NR	9 (8.6)
<i>Race and Ethnicity</i>	
White	19 (18.1)
African American	74 (70.5)
Hispanic	8 (7.6)
Multi-racial	3 (2.9)
NR	1 (1.0)
<i>Receive SNAP Benefits<sup>c</sup></i>	
No	45 (42.9)
Yes	59 (56.2)
NR	1 (1.0)

<sup>a</sup>Percentages do not add to 100% due to rounding.

<sup>b</sup>NR = No response

<sup>c</sup>SNAP = Supplemental Nutrition Assistance Program

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**Table 3**Top 10 Barriers to Fruit and Vegetable Access as Perceived by Participants<sup>a</sup>

Barrier	Definition	Number of focus groups that reference	Total references across all focus groups <sup>b</sup>
Cost	Cost of fresh F&Vs (whether expensive or inexpensive)	13	137
Cooking & nutrition knowledge	Knowledge on how to prepare, assemble, and cook fresh F&Vs.	13	97
Convenience	Location, time, and cooking fresh F&Vs; also refers to individuals' personal schedule, or a store's hours of operation	12	59
Quality	Freshness, appearance, and smell	13	49
Personal food preferences	What a participant wants to eat, wishes they could eat, and what they currently eat. Also refers to taste -- whether good or bad -- and how the food is perceived by the participant	12	47
Availability	Availability of F&V in certain stores, or availability of food outlets in a community. Also refers to "geographic location."	11	41
Transportation	Car, bus, bike, or walk -- any mode of transportation to buy fresh F&Vs	13	32
Perishability	Consideration for how long F&Vs will stay fresh after purchased	11	24
Variety	Availability of different fresh F&Vs; having the opportunity to purchase preferred F&Vs	9	22
Safety	Feeling safe when traveling to or from the store and during the shopping process	6	12

<sup>a</sup>Table adapted from Haynes-Maslow L, Parsons SE, Wheeler SB, Leone LA. Understanding barriers to fruit and vegetable consumption among low-income individuals: A qualitative study. *Preventing Chronic Disease*. 2013;10:1202–06.

<sup>b</sup>Total references calculated based on number of times each participant mentions code.

**Table 4**

Barriers addressed and not addressed by Fruit and Vegetable Access Strategies by SEF-Level

SEF-LEVEL	MOBILE MARKETS				EBT AT FARMERS' MARKETS				COMMUNITY GARDENS			
	Barriers Addressed	Barriers not Addressed	New Barriers Introduced	Barriers Addressed	Barriers not Addressed	New Barriers Introduced	Barriers Addressed	Barriers not Addressed	New Barriers Introduced	Barriers Addressed	Barriers not Addressed	New Barriers Introduced
<i>Individual</i>		<ul style="list-style-type: none"> <li>Cooking &amp; nutrition knowledge</li> <li>Personal food preferences</li> </ul>			<ul style="list-style-type: none"> <li>Cooking &amp; nutrition knowledge</li> <li>Personal food preferences</li> </ul>	<ul style="list-style-type: none"> <li>SNAP stigma</li> </ul>	<ul style="list-style-type: none"> <li>Gardening knowledge</li> </ul>	<ul style="list-style-type: none"> <li>Personal food preferences</li> </ul>				
<i>Community</i>	<ul style="list-style-type: none"> <li>Availability</li> <li>Transportation</li> <li>Quality</li> <li>Variety</li> <li>Perishability</li> <li>Convenience</li> </ul>	<ul style="list-style-type: none"> <li>Cost</li> </ul>	<ul style="list-style-type: none"> <li>Neighborhood safety</li> <li>Vendor Safety</li> </ul>	<ul style="list-style-type: none"> <li>Cost<sup>a</sup></li> </ul>	<ul style="list-style-type: none"> <li>Neighborhood safety</li> <li>Transportation</li> <li>Vendor safety</li> <li>Perishability</li> <li>Cost<sup>a</sup></li> </ul>		<ul style="list-style-type: none"> <li>Availability</li> <li>Quality</li> <li>Variety</li> <li>Perishability</li> <li>Cost</li> </ul>		<ul style="list-style-type: none"> <li>Neighborhood safety</li> <li>Implementation logistics</li> </ul>			
<i>Policy</i>					<ul style="list-style-type: none"> <li>SNAP monthly allowance</li> </ul>							

<sup>a</sup> Due to the mixed findings, cost is considered both a barrier addressed and not addressed by EBT at farmers' markets.