

**A COMMUNITY ANALYSIS OF FRESH FOOD PROGRAMS IN  
NEW CASTLE COUNTY, DELAWARE**

by

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A thesis submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Bachelor in Science with Honors Degree in Natural Resource Management with Distinction.

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## **ABSTRACT**

This study analyzes community preferences regarding fresh food programs in New Castle County, Delaware. During the summer of 2015, a paper survey with thirteen questions was administered to clients of farmer's markets in Wilmington and Hockessin, Delaware. Sixty-four patrons were selected at random and participated. The study focused on interest in the following fresh food programs: nutrition classes, neighborhood gardens, mobile markets, farmer's markets, and cooking classes. The locations in which the survey was distributed were categorized into three types: "business center," "farmer's market," and "service center." Survey data was then analyzed using Excel and JMP to determine whether there existed a statistically significant relationship between proposed programs and location.

Due to limitations in survey distribution, results were not statistically significant. Despite this, results of the study indicate the desire for more diverse fresh food programming in the county. A summary of the five fresh food programs is provided in the conclusion of the survey and methods of implementation are discussed. Through assessment of desired community programs, the study is useful to local government and/or social services seeking to establish future fresh food community programs in New Castle County, Delaware.



## **Chapter 1**

### **INTRODUCTION**

Without ready access to healthy, affordable food, much of the United State's population is denied a nutritious and non-processed diet. As defined by a USDA economic research report in 2011, food insecurity is defined as a state in which "consistent access to adequate food is limited by a lack of money and other resources during the year (Coleman-Jensen 2011)." According to Feeding America statistics, 48.1 million Americans, or 14 percent of America's households, were "food insecure" in the year 2014 (Feeding America 2016). This issue affects every county of the United States, though rates of food insecurity are substantially higher than the national average in households with incomes near the poverty line, households with children (19%) and among minority groups (26% in Black non-Hispanic and 22% in Hispanic households) (Feeding America 2016). Senior citizens are also affected, comprising 9% of the food insecure population in the year 2013 (Feeding America 2016).

Being able to supplement a nutritious diet requires the financial means and the accessibility to healthy foods. The areas in which food insecurity is greatest are areas of low income and minority housing. Areas, most frequently in the inner city, that experience racialized policy outcomes such as health disparities, lack of funding for education and lack of transportation (Elsheikh 2013).

Often there are no full-service supermarkets within areas of food insecurity. The USDA defines these as “food deserts,” or “parts of the country void of fresh fruit, vegetables, and other healthful whole foods, usually found in impoverished areas (USDA 2016).” In these cases, any grocery stores or healthy food providers that had once existed abandoned the inner city neighborhoods in seek of more profitable locations, leaving corner and convenience stores as the only shopping options. With limited finances and a distant proximity to healthier options, local selections are limited to cheap, energy-dense foods that are high in calories but lacking in nutritious value. If the corner stores do provide low-fat foods or fresh produce, the produce is usually of poorer quality and the price of these items is higher than it would be in a supermarket. With no means of public transport to access healthier options, a social barrier for nutritious eating and hunger persists.

Low-income and food insecure people can be vulnerable to obesity, a study performed by the Food Research and Action Center reported, but the link is not necessarily causal (Food Research and Action Center 2015). Even so, obesity can co-exist with food insecurity due to limited resources in the forms of places to purchase healthier foods, opportunities for physical activity, and access to health care.

### **Statement of Purpose**

In keeping up with current consumer trends, city governments and social services continue to promote the establishment of farmer’s markets in their own communities. However, not every community is the same. If the culture of the local

consumer base is not considered, there will exist a disconnect between perceived and actual community preferences. The failure of farmer's markets and community gardens is often the result of ignoring the character of the community. Ultimately, it is community's patronage and support that forms the foundation of successful public programs.

The focus population of this study was residents of New Castle County, Delaware, specifically the city of Wilmington and the town of Hockessin, since there were already farmer's markets and a somewhat-consistent consumer base established. Prior studies in Delaware addressed the growing trend in food deserts, but there are far fewer studies on the availability and success of fresh food programs operating in the county. State Secretary of Agriculture Ed Kee stated, "We (the state of Delaware) have seen an incredible rise in people wanting to eat healthy and buy fresh." (Murray 2014) But just how successful are these farmer's markets in terms of consumer interest? Are there programs that consumers would prefer to see?

This study uses the stated preferences of consumers who attend farmer's markets to determine the most desired fresh food programs in the New Castle County area. While not representative of every community as a whole, the results of this study can provide insight into the desires of those interested in fresh food consumption in their area so that future fresh food programs may be more aligned with assessed preferences.

### **Content of Study**

In addition to the introduction, the study is divided into five chapters. The second is a review of literature, citing nutrition assistance program information and

providing background on the means by which the study was conducted. The survey procedures, including the survey questionnaire, are outlined in the third chapter. The fourth chapter discusses how statistical analysis programs were employed to organize the data. The following chapter is the results section, outlining conclusions from the data and using these findings to discuss observed results. The sixth chapter expands on the results section, offering means of implementing specific programs based on location. The final chapter of the report is the conclusion, which reflects on limitations and suggests future research to be conducted.

## **Chapter 2**

### **LITERATURE REVIEW**

#### **The Farmer's Market Movement**

While local food production is a prehistoric concept, farmer's markets in the United States have a recent history. Farmer's markets are open spaces in which local farmers can sell fresh produce directly to customers. One of the earliest documented, and still existing, examples of this is the L.A. Farmer's Market established in 1934 (Mercier 2015). On a national scale, World War II experienced widespread establishments of local markets, as outlets to sell the fruits and vegetables grown in Victory Gardens (Mercier 2015). With trends in suburban sprawl and increased production of mass produce, the movement waned but by the 1970s, with the passage of the Farmer-to-Consumer Direct Marketing Act in 1976, farmer activity increased again through the assistance of County Cooperative Extension Agents (Mercier 2015).

In 1993, Rutgers University compiled the first systematic analysis of farmer's markets. Based on a nationwide count of 1,775 markets in 1994, they found that the majority of the consumer base was middle-aged, white, suburban residents (Mercier 2015). Since this study, the consumer base of farmer's markets has been expanded to include low-income and minority populations aided by government assistance programs such as SNAP (Supplemental Nutrition Assistance Program) and WIC (Women, Infants, and Children). The Farm Bill of 2008, for example, provided additional nutrition incentives to SNAP recipients (USDA.gov 2015).

With expanding consumer bases, local fresh food outlets are becoming increasingly attractive for farmers. Paralleling farmer interest, consumer demand for fresher, more natural foods has grown. Despite organic products in grocery stores, consumers prefer truly natural products than processed organic produce, according to a 2015 study (Avant 2015). Thus, farmer's markets, advertising "fresh from the farm" products, have gained mainstream attention. According to a USDA study, the number of farmer's markets has increased by roughly 380% since the initial 1994 Rutgers University estimate, to 8,476 in 2015 (USDA.gov 2015).

### **Nutrition Assistance Programs**

The growth in the farmer's market movement has enabled growth in financial accessibility to fresh, healthy foods. The Food Supplement Program (FSP) is "a program that enables low-income households to purchase the food they need to maintain adequate nutritional levels." (Benefits.gov 2016) The United States Department of Agriculture currently operates 15 food supplement programs, or nutrition assistance programs, to combat issues of food insecurity (USDA 2016). The largest of these programs is the Supplemental Nutrition Assistance Program (SNAP), the new name for the federal Food Stamp Program. By "increasing food purchasing power" the program assisted more than 46 million low-income Americans in 2014 to achieve a nutritionally adequate diet per month (Center on Budget and Policy Priorities 2014). According to those statistics, SNAP reached 15% of the nation's population, or 1 in 7 people (Center on Budget and Policy Priorities). SNAP operates through an electronic benefit transfer (EBT) system, a payment card operating similarly to a bankcard that can be used at participating retailers to purchase food and

non-alcoholic beverages (FRAC 2016). Qualifications for the program include having a gross monthly income at or below 130% of the poverty line, having a net income at or below the poverty line, and having assets fall at or below \$2,250 for households without elderly or disabled members, and \$3,250 or less for households with an elderly or disabled member (Center on Budget and Policy Priorities 2015). According to the Center on Budget and Policy Priorities, with the average SNAP benefit per person being about \$1.41 per person per meal, benefit recipients are expected to spend 30% of their net income on food (Center on Budget and Policy Priorities 2015). SNAP benefits expand beyond those that receive benefits directly, as well. SNAP dollars are spent on goods or help contribute to grocer profits which are redistributed to employers, both of which contributing to economic growth. Estimates state that, “in a weak economy, \$1 in SNAP benefits generates \$1.70 in economic activity (Center on Budget and Policy Priorities 2015).”

Another major nutrition assistance program is Women, Infants, and Children (WIC), which seeks to prevent health problems in the early stages of childhood development. The program provides federal grants to states for “supplemental foods, health care referrals, nutrition education for low-income pregnant, breastfeeding, and non-breastfeeding postpartum women, and to infants and children up to age five who are found to be at nutritional risk (Food and Nutrition Service 2016).” Qualifications for this program begin with a face-to-face visit at a WIC clinic. If a child is being enrolled in the program, the clinic will perform a check-up and then provide the nutrition that the child needs, including fruits, vegetables and milk. The parent is then provided with a voucher that includes a check correlating to an allowable foods list for shopping. The clinic will also provide referrals, whether the family needs childcare

equipment or connections to healthcare (Colorado Department of Public Health and Environment 2011).

### **Food Supplement Programs - Delaware**

In the state of Delaware, the general program requirements for the Supplemental Nutrition Assistance Program (SNAP), according to the Delaware Food Stamp Program, are that:

“You must be a resident of the state of Delaware and fall into one of two groups: (1) those with a current bank balance (savings and checking combined) under \$2,001, or (2) those with a current bank balance (savings and checking combined) under \$3,001 who share their household with a person or persons age 60 and over, or with a person with a disability (a child, your spouse, a parent, or yourself).” (Benefits.gov 2016)

In the 2014 fiscal year, 150,000 of Delaware’s residents, 16% of the state population or 1 in 6 people, received SNAP benefits overseen by the USDA’s Food and Nutrition Service (Center on Budget and Policy Priorities). The majority of those benefiting from SNAP benefits are children, the elderly and the disabled. According to approximate analyses reported by the USDA Food and Nutrition Service, 46% of total SNAP recipients in the state of Delaware are children, 24% are adults living with children and 9% are disabled adults (Center on Budget and Policy Priorities 2015). In addition to direct help to recipients, SNAP benefits contributed \$220 million into Delaware’s economy in 2014, alone (Center on Budget and Policy Priorities 2015).



## **Bright Spot Ventures**

Research for this thesis was conducted through the University of Delaware's Service Learning Scholars Program. As a summer internship, the author worked as a mobile market manager at Bright Spot Ventures (Bright Spot Ventures 2016), a social service founded in April 2010 based in Wilmington, Delaware. Created by the West End Neighborhood House (West End Neighborhood House 2016), its mission is to employ youth that age out of foster care, and provide them with basic job skills and training to obtain entry-level employment in both agricultural and non-agricultural fields. The program includes an Urban Agricultural Initiative - an urban farm and farmer's market at Cool Springs Park, Wilmington, Delaware to grow and sell fresh produce to an urban consumer base. In addition to the weekly farmer's market in the park, Bright Spot owns a refrigerated truck to transport excess produce grown by the farm to other markets in the county. By the end of the 2015 summer season, Bright Spot Ventures provided their produce to eight markets around Wilmington, Delaware.

## **Bright Spot Venture's Farmer's Markets**

Bright Spot Ventures operated at eight different locations throughout the span of their April 2015 - October 2015 season. The weekly operations schedule by the end of the season is listed below:

*Tuesday: Barclay's Courtyard, Wilmington Senior Center*

*Wednesday: Claymore Senior Center, Rodney Square Farmer's Market, JP Morgan Chase Courtyard*

*Thursday: Hercules Plaza, Cool Springs Farmers' Market*

*Friday: Carousel Park and Equestrian Center*

While the first commitment of Bright Spot Ventures is providing opportunity to youth transitioning out of foster care, the second is providing produce to the largest consumer base as possible. As the summer progressed, there were certain markets where the sale of produce was not profitable and led to the youth not truly utilizing their experience. Therefore, the weekly operations schedule of Bright Spot was adjusted in accordance with market demand. These permanent market locations are divided into the categories “business center,” “service center” and “farmer’s market (Table 1).”

Table 1      Bright Spot Ventures’ markets divided by location

Business Center	Service Center	Farmer’s Market
Hercules Plaza Courtyard	Claymore Senior Center	Cool Springs Farmer’s Market
Rodney Square Courtyard	Wilmington Senior Center	Carousel Equestrian Park
Barclay’s Center Courtyard	WIC Center	
JP Morgan Chase Courtyard		

‘Business Center’ is defined as being either outside or in close proximity to a part of the city where shops, financial centers or offices are located. Of the farmer’s market locations, Hercules Plaza, Rodney Square, Barclay’s Center, and the JP Morgan Chase Center are classified as such. The ‘Service Centers’ are defined as establishments that provide supporting services to specific groups in the community. In the case of Bright Spot, service centers included senior centers such as the Claymore Senior Center and the Wilmington Senior Center, and a nutritional assistance WIC Center. Lastly, Cool Spring’s Farmer’s Market and Carousel Park

Market would be classified as ‘Farmer’s Markets,’ or outdoor markets that provide local food and amenities directly to patrons.

## **Chapter 3**

### **SURVEY PROCEDURES**

#### **Survey Setup**

Analyzing consumer attitudes towards fresh food programs required direct feedback from those who frequented the markets. A 13-question paper survey was developed with the intention of distribution and completion at farmer's market sites. The sample population was patrons of Bright Spot Venture's eight farmers' markets. All consumers were asked to participate, though 100 completed surveys was the desired response number. A sample size of this number would provide a good representation of the consumer population.

Dr. Steven E. Hastings and Dr. Thomas W. Ilvento provided insight on question development, guided research objectives, and reviewed drafts of the survey. Once the final draft of the survey was approved, it was submitted to the Human Subjects Review Board where it received exemption status.

The final product was single page with questions on the front and back (Appendix A). At the end of the questions, there was a redeemable "Bonus Buck" to provide incentive to take the survey. With permission from Bright Spot Ventures, completing the survey provided consumers with an additional \$1 to spend on produce after a \$1 or more purchase was made at the farmer's market. A month into the research an alternative survey was developed. The questions remained the same but were translated into Spanish to cater to a Hispanic population who frequented some of the markets.

The survey was designed to assess current consumer habits in relation to fresh foods and determine what fresh food programs consumers would like to see in the future. Questions one to three involved where consumers shop, how often they did the shopping, and if they purchased fresh produce when shopping. These questions helped determine where and how often the consumer purchased fresh produce for himself or herself or their family.

Question four involved accessibility to the produce; why the consumer may not always buy fresh foods. Question five, the focal question in the study, is how interested the consumer is in a list of five potential fresh food community programs. The question also allows an open-ended answer in which the respondent can provide an alternative program they would be interested in. The options include nutrition class, a neighborhood garden, a mobile market (such as that run by Bright Spot Ventures), a farmer's market, and classes on learning how to cook locally grown food. Under each program respondents are asked to circle "Very Interested," "Somewhat Interested," or "Uninterested." The interests of the community were determined when responses were analyzed.

The next two questions (six and seven) involve how the produce was purchased to determine whether nutrition assistance programs were used. Questions eight to thirteen are demographic questions. This section helped develop the socioeconomic profiles of respondents through questions such as year of birth, ethnicity, education level and income. Placed at the end of the study, respondents were more comfortable in answering these personal questions.

Originally, the purpose of study was to identify factors behind accessibility to fresh foods. Through further literature review, however, the thesis evolved to assess the efficiency of farmer's markets based on consumer feedback. Therefore, there are some questions on the questionnaire that are no longer applicable to the research aim. Surveys that include unanswered questions will still be considered in the analysis of data.

### **Survey Administration**

Survey development was completed in June and administration began in July. Roughly 100 copies of the survey were printed. At the mobile market stops and at the Cool Springs Farmer's Market, the study was distributed to random patrons who made purchases. In asking consumers to complete the survey, they were told that their responses would assist in a Service Learning Scholar Study in the Department of Applied Economics and Statistics and that their answers would remain anonymous and confidential. They were also made aware of the "Bonus Bucks" that would be received following their participation. Approximately 80 patrons were approached to complete the survey. Of that number, 64 responded for a response rate of 80%.

### **Summary**

The methodology for this study was a paper-copy survey distributed to a sample of patrons to farmer's markets in New Castle, Delaware. The survey was designed to identify consumer habits and evaluate interest in community programs related to fresh food consumption.

## **Chapter 4**

### **ANALYSIS**

Survey distribution began in early July and concluded in early August. By the end of the administration process, the response rate was about 80% with a completed survey total of 64. The data collected was then analyzed using Microsoft Excel and SAS Institute's JMP statistical software.

#### **Excel**

An Excel worksheet is an excellent way to record and manipulate survey data. The data was entered into 34 columns of the worksheet; the first five columns denoting the ID number of the survey, the date, the day of the week, the month and the location at which the survey was administered. The remaining columns were for the responses to survey questions, each subquestion receiving its own column. Qualitative responses to these questions were then denoted to quantitative numbers. For example, the response "Often" would be represented by the number 1, "Sometimes" by the number 2, "Rarely" by the number 3 and "Never" by the number 4.

#### **JMP**

An advantage of using Excel is that data in a worksheet can be easily input into more sophisticated statistical software, such as JMP. After the survey data was input into JMP it was fit "by location" to create contingency tables. Estimates were then

made for the proportion of the population that was interested in various fresh food programs. For each program, the proportion expressing “Very Interested” in that program was estimated. A 95% confidence interval was placed around the estimate to define a range of the possible values for the true proportion. A confidence interval of 95% uses a Z-value of 1.96 to calculate the interval estimate. These calculations were then reported for each program. Contingency tables, as well as confidence intervals around the estimates, are presented and interpreted in the next chapter.

### **Chi-Square Test**

To determine the relationship between the selected categorical variables, specifically whether the results of the data were statistically significant, a chi-square test was conducted using JMP. Reported at the bottom of the contingency tables, a Chi-square statistic reflects the strength of the relationship between variables. The null hypothesis for the Chi-square test is that there is no relationship between the variables. If the null hypothesis is rejected, then it is concluded that there is some relationship and the nature of that relationship is investigated. The Chi-square test is sensitive to small samples and empty cells within the table. Therefore, it was necessary to collapse some variables into reasonable categories in order to have a valid test. In the analysis of this test, a  $p < .05$  means there exists some relationship between the variables, or that they are not independent. These results are presented and interpreted in the next chapter.



### **Summary**

This section served to explain the analysis methods employed in the study. Microsoft Excel and the statistical analysis program JMP were the software used to organize and interpret the results of collected survey data. Within JMP, a Chi-square test was conducted to determine the statistical significance of the findings.

## **Chapter 5**

### **RESULTS**

The intent of the study was to determine which fresh food programs would be most successful in three locations (service center, business center, farmer's market) based on consumer response. By obtaining a large frequency of response, conclusive results could then be cited by policy makers seeking to establish new programming in New Castle County, Delaware communities. In conducting the study, it was expected that each group would preference different programs based on the demographics observed among the patrons to those markets.

#### **Observed - Contingency Tables and Related Chi-Square Tests**

The first question focused on community interest in a neighborhood garden. The overall interest is reflected in Table 2. The proportion very interested in the program is .5079 (32/63). A 95% confidence interval around this estimate is .3845 to .6314 ( $Z=1.96$  and S.E. is .0630). The large width around the estimate is due to a relatively small sample size.

Table 2 Community interest levels in neighborhood gardens

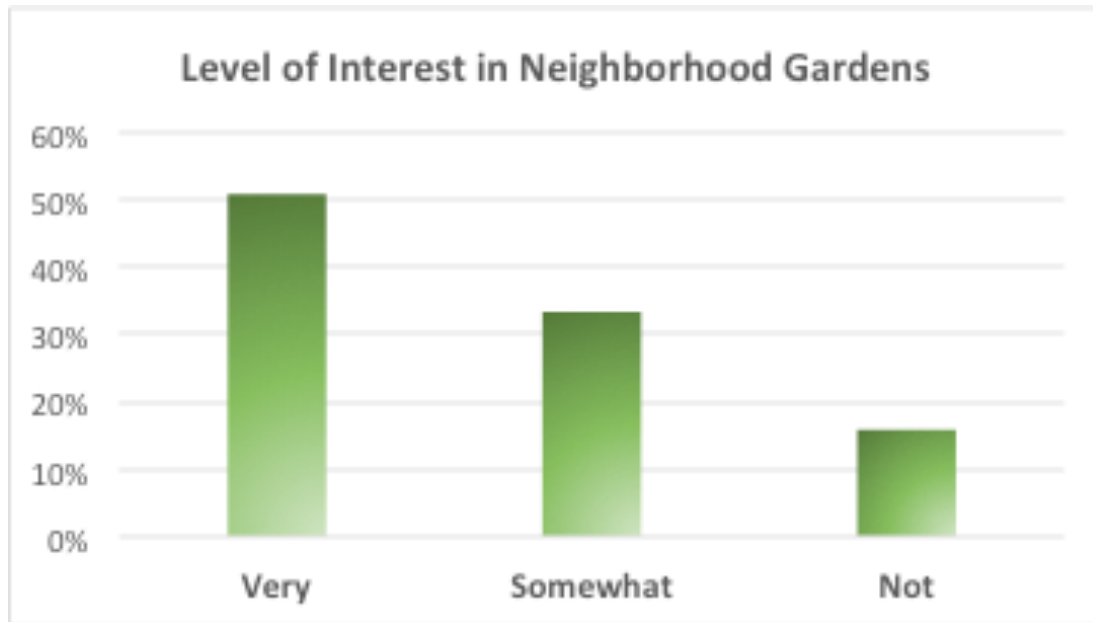


Table 3 Contingency table representing neighborhood garden interest by service center, business center and farmer's market locations

Count Row %	Very Interested	Somewhat Interested	Uninterested	Total
Service Ctr	5 71.43	2 28.57	0 0.00	7
Business Ctr	10 47.62	8 38.10	3 14.29	21
Farmers Mkt	17 48.57	11 31.43	7 20.00	35
Total	32	21	10	63

Table 4 Likelihood ratios: Neighborhood garden by service center, business center and farmer's market locations

Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	3.426	0.4892
Pearson	2.411	0.6606

Table 3 shows the crosstabulation of interest in a neighborhood garden and location of the market. Those who responded at service centers expressed the most interest in a neighborhood garden (71.43%). However, the Chi-square test of independence revealed that no statistically significant relationship exists between interest in neighborhood gardens and location. In other words, patron interest in neighborhood gardens were not influenced by where they shopped. However, the modal category of the contingency table revealed that consumers are very interested in neighborhood gardens.

Overall community interest in nutrition classes is reflected in Table 5. The proportion very interested in the program is .2344 (15/64). A 95% confidence interval around this estimate is .13 to .34 ( $Z=1.96$  and S.E. is .0530). The large width around the estimate is due to a relatively small sample size.

Table 5 Community interest levels in nutrition classes

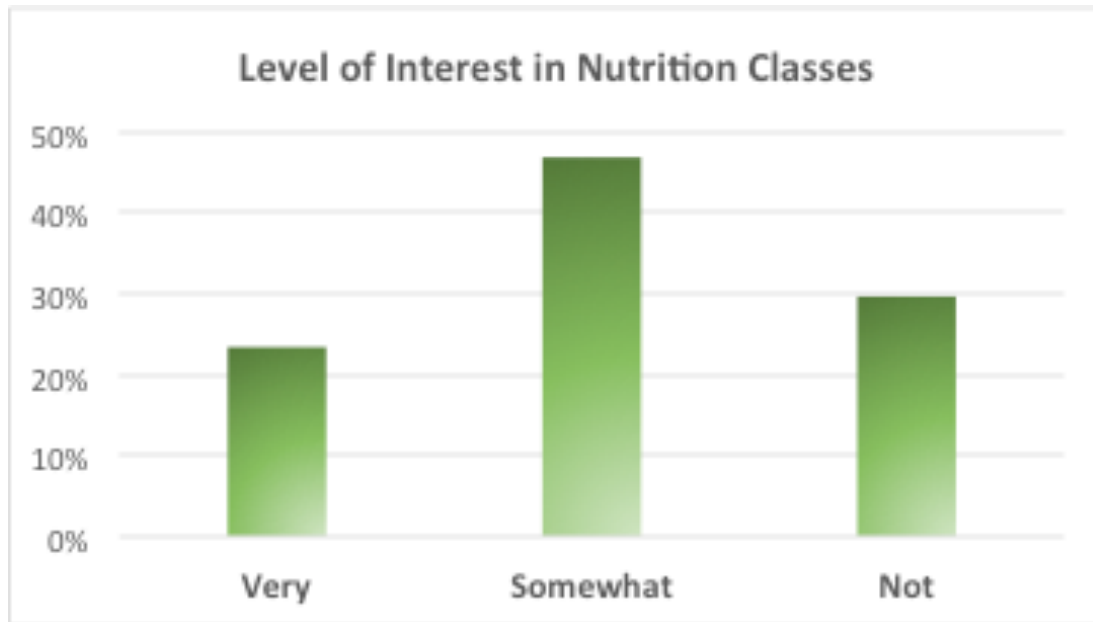


Table 6 Contingency table representing nutrition class interest by service center, business center and farmer's market locations

Count Row %	Very Interested	Somewhat Interested	Uninterested	Total
Service Ctr	4 57.14	0 0.00	3 42.86	7
Business Ctr	4 18.18	12 54.55	6 27.27	22
Farmers Mkt	7 20.00	18 51.43	10 28.57	35
Total	15	30	19	64

Table 7 Likelihood ratios: Nutrition classes by service center, business center and farmer's market locations

Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	10.271	0.0361*
Pearson	8.008	0.0913

Table 6 shows the crosstabulation of interest in nutrition classes and location of the market. Those who responded at service centers expressed the most interest in a nutrition classes (57.14%). However, the Chi-square test of independence revealed that no statistically significant relationship exists between the variables nutrition classes and location. The modal category of the contingency table revealed that consumers are somewhat in nutrition classes.

Overall community interest in a mobile market is reflected in Table 8. The proportion very interested in the program is .4603 (29/63). A 95% confidence interval around this estimate is .34 to .58 ( $Z=1.96$  and S.E. is .0628). The large width around the estimate is due to a relatively small sample size.

Table 8 Community interest levels in a mobile market



Table 9 Contingency table representing mobile market interest by service center, business center and farmer's market locations

Count Row %	Very Interested	Somewhat Interested	Uninterested	Total
Service Ctr	5 71.43	1 14.29	1 14.29	7
Business Ctr	11 52.38	9 42.86	1 4.76	21
Farmers Mkt	13 37.14	14 40.00	8 22.86	35
Total	29	24	10	63

Table 10 Likelihood ratios: Mobile market by service center, business center and farmer's market locations

Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	6.398	0.1713
Pearson	5.686	0.2239

Table 9 shows the crosstabulation of interest in mobile market and location of the market. Those who responded at service centers expressed the most interest in a mobile market (71.43%). However, the Chi-square test of independence revealed that no statistically significant relationship exists between interest in mobile markets and location. In other words, patron interest in mobile markets were not influenced by where they shopped. However, the modal category of the contingency table revealed that consumers are very interested in mobile markets.

Overall community interest in a farmer's market is reflected in Table 11. The proportion very interested in the program is .7813 (50/62). A 95% confidence interval around this estimate is .68 to .88 ( $Z=1.96$  and S.E. is .0525). The large width around the estimate is due to a relatively small sample size.



Table 11 Community interest levels in a farmer's market



Table 12 Contingency table representing farmer's market interest by service center, business center and farmer's market locations

Count Row %	Very Interested	Somewhat Interested	Total
Service Ctr	7 100.00	0 0.00	7
Business Ctr	15 68.18	7 31.82	22
Farmers Mkt	28 80.00	7 20.00	35
Total	50	14	64

Table 13 Likelihood ratios: Farmer's market by service center, business center and farmer's market locations

Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	4.691	0.0958
Pearson	3.305	0.1916

Table 12 shows the crosstabulation of interest in a farmer's market and location of the market. Those who responded at service centers expressed the most interest in a farmer's market (100.00%). While the Chi-square test of independence revealed that no statistically significant relationship exists between interest in farmer's markets and location, there were no participants of the survey who were uninterested in farmer's markets and the modal category of the contingency table was "very interested." Out of all the suggested fresh food programs, farmer's markets received the most interest based on consumer survey response.

Overall community interest in cooking classes is reflected in Table 14. The proportion very interested in the program is .4032 (25/62). A 95% confidence interval around this estimate is .28 to .53 ( $Z=1.96$  and S.E. is .0623). The large width around the estimate is due to a relatively small sample size.

Table 14 Community interest levels in cooking classes

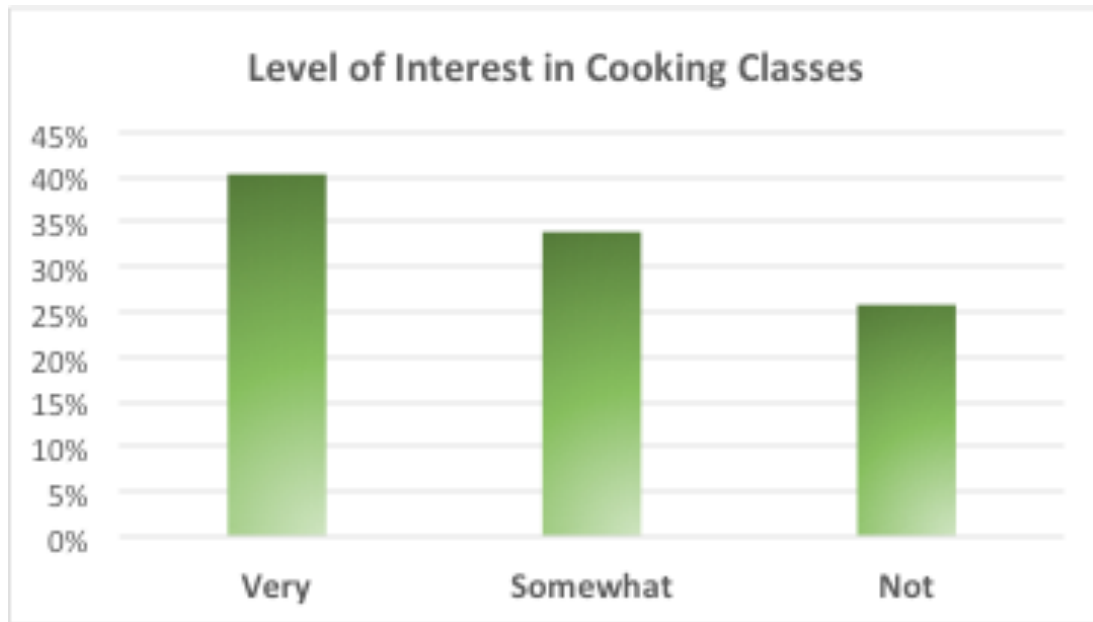


Table 15 Contingency table representing cooking class interest by service center, business center and farmer's market locations

Count Row %	Very Interested	Somewhat Interested	Uninterested	Total
Service Ctr	3 42.86	2 28.57	2 28.57	7
Business Ctr	9 42.86	6 28.57	6 28.57	21
Farmers Mkt	13 38.24	13 38.24	8 23.53	34
Total	25	21	16	62

Table 16 Likelihood ratios: Cooking classes by service center, business center and farmer's market locations

Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	0.660	0.9561
Pearson	0.656	0.9566

Table 15 shows the crosstabulation of interest in cooking classes and location of the market. Business centers and service centers expressed similar interest in cooking classes (42.86%). While the modal category of the contingency table is “very interested,” the Chi-square test of independence revealed that no statistically significant relationship exists between interest in cooking classes and location.

### Summary

There were five proposed fresh food programs on the survey, to which the majority of participants were somewhat to very interested in. However, 20% of the cells in the contingency table expected counts of less than 5. Due to the limited response rate of the survey, Chi-square probability calculations could not conclusively prove statistical relationships between location and community interest in fresh food programs. Despite this, the results revealed that demand exists for more diverse fresh food programming in New Castle County, Delaware. The next chapter describes ways to integrate these future programs into the area, with specific recommendations depending on service center, business center or farmer's market status.

## **Chapter 6**

### **CONCLUSIONS**

The fresh food programs that were used for statistical analysis in the previous chapter are discussed qualitatively in this chapter. Under each subheading is a discussion on the implementation of these specific programs, reflected upon for their contributions towards community improvement by way of providing economic, social and public health benefits.

#### **Implementation of Future Programs**

##### **Nutrition Classes**

While community members acknowledge that nutrition is fundamental to maintaining a healthy lifestyle, it is often an underprovided area of programming. Consistent with the preferences of the groups surveyed, service centers were the group “most interested” in nutrition classes so their implementation would yield the greatest participation. A study on health and senior citizens found that “good diet in later years of life reduces the risk of osteoporosis, high blood pressure, heart diseases and certain cancers (Medline Plus 2016).” In order to achieve these means, incorporating future health programs in these centers requires investment in hiring a full-time registered dietitian, either using the American Dietetic Association or using local references to find a credible professional. Once hired, the dietitian on staff would work closely with

the members of the center to develop effective individualized or group plans that emphasize positive health behaviors in relation to smart food choices and healthy lifestyles.

Specific programs that would be effective in a senior center, already preexisting in some of the surveyed locations, would include weight loss classes, guest speakers, relaying strategies for purchasing food related to menu planning, strategies for dining out, and providing individual and group counseling; programs to give members opportunities to experience the benefits of healthy nutrition.

As a positive example, the Food Bank of Delaware provides SNAP education sessions that provide nutritional guidance and empowerment to clients. Lessons taught in these sessions include “meal planning, budget planning/shopping, food safety and cooking skills (Food Bank of Delaware 2016).” For community members who are SNAP recipients and are limited in their physical or financial access to alternative nutrition classes, they can schedule nutrition sessions with the New Castle County hunger-relief program partners found on the Food Bank Website.

Patrons to the farmer’s markets were also interested in the integration of more nutrition classes in their area. A suggestion for these outlets would be for the organization or individual in charge of the market to invite dietitians to either set up tables at the venue, or to provide information regarding nutrition classes in the form of brochures that could be distributed by other vendors.

### **Neighborhood Garden**

Community gardens provide economic, environmental, social, and health benefits. As far as cost concerns, in many cases local government or community

development groups would support the construction of the garden or even contribute volunteers or funding beyond the point of self-sustainment. Once operational, the gardens would provide opportunity for saving money or even making a profit. According to the Neighbour to Neighbor Centre, “an investment of 10 dollars can bring a value of 500 to 700 dollars a season (Community Food 2013).” If not sold for profit, than the produce from the garden could be used to supplement food provided in the cafeterias of service and business centers, or donated to local food programs; shortening the commodity chain for obtaining a nutritious diet.

The flexibility of community gardens is that there is no specific size requirement for constructing them. Frequently, they are developed in vacant lots or on pre-existing property or in pre-existing garden spaces, the size of which is dependent on the funds available and the size of the desired harvest. The community garden would benefit service centers regardless if these are senior centers or nutritional assistance centers. For both, the hands-on nature of gardens could provide an outlet for physical activity, mental activity and stress relief. By requiring the assistance of the community to maintain production, those who visit the garden would be exposed to different cultures and increase their food knowledge, helping to strengthen the community relationship of the center. In the long-term, localizing fresh food and involving the public in its production would also instill positive lifetime dietary behaviors. If developed in a low-income urban community, the garden would increase access to nutritious, locally grown foods, reducing food insecurity. In these communities, the service center could also offer part-time employment or volunteer opportunities in maintaining the plants there, improving the economy and involvement of the neighborhood.

## **Mobile Market**

A mobile market is defined as “renovated trucks or trailers that carry fresh and healthy foods into urban communities (Windmoeller 2012).” These markets often frequent neighborhoods that do not have access or cannot afford healthy food outlets, combatting the food insecurity of those areas. Similar to a fresh food grocery on wheels, implementing this program in a community would not establish a permanent fixture but would increase the frequency in which these markets were scheduled to deliver fresh foods. These markets receive their product from farms but funding often comes in the form of private business, donations or local government. The mobile market truck at Bright Spot Ventures in Wilmington, Delaware, for example, is funded by a grant from Barclay’s Bank. If there were no farms available in the area, another suggestion would be to pair with a local food bank. The food bank has a similar purpose in providing meals to high-need areas, and could distribute non-perishable groceries and fresh food in similar delivery methods.

For all three locations (service centers, business centers and farmer’s markets), increasing the presence of mobile markets would alleviate accessibility issues related to obtaining fresh, locally grown foods. To integrate mobile markets into a community requires developing a partnership with the owner of the truck as well as with local businesses that would provide the market for mobile market stops during scheduled hours. Establishing a mobile market at a senior center, for example, could include the following information and agreements: The truck will park in a reserved spot in the senior center parking lot and sell seasonal produce from April until October. Before the season begins the senior center will purchase \$1000 worth of tokens from the market. These tokens will then be distributed among their senior center patrons that can be redeemed at the market throughout the season. The use of these tokens will



benefit both market and patron as it provides a consumer base and economic profit for the market and incentivizes the patrons to attend the market, leading to more healthy lifestyles.

A similar contract could be established with a business center. The time at which the market is established should consider workplace hours, however, as most produce will be sold during lunch break or at the end of the day as people leave the workplace. At a farmer's market, the mobile market would act as any other stand would, providing local produce to the patrons of the market. The majority of mobile markets accept EBT benefits, though, which would attract a broader consumer base to the market.

### **Farmer's Market**

Whether establishing a farmer's market in a community or managing an already existing one, referring to prepared manuals<sup>1</sup> or speaking with the organizers of other markets are the most useful resources for gaining guidance and organizational instruction. It should be noted that in referencing a manual, each community is unique, requiring individualized market development. The first step in establishing a market should be to determine the goal of that market. Whether to promote community growth, bring fresh food accessibility to an urban neighborhood or just for financial profit, identifying its purpose will help establish any organizations, local businesses or

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<sup>1</sup> For an example of a prepared manual, refer to:

vendors who may share that goal and support the inception of the market. Much of the legwork of creating a farmers market occurs before the harvest season and is comprised of researching, recruiting vendors, securing a market site, identifying sources of funding and promoting its opening.

To determine whether a farmer's market will be an effective program in an area requires communication with that community. Surveys are an effective way of determining consumer preference in the area and will dictate the products sold at the market. Supply must also be considered; whether there existing farmers markets or supermarkets in the area, or even vendors willing to participate in the market setting. Beyond supply and demand, operation time and place will determine the season of the market, and the clientele you are attracting. For example, Sunday farmer's markets in the local park will most likely attract families.

After establishing the market, effort needs to be made in promoting its existence and making the program a staple of the community. Good advertising, a wide variety of vendors and sound management will help to accomplish this goal (How to Organize 2012). If the community voice is utilized in the planning process, there will be support in its execution.

While Delaware is in the process of developing a comprehensive farmer's market manual, the state of Massachusetts has an online document that provides an overview of establishing markets in the state (see footnote 1). The document reviews, in greater depth, all information stated above, as well as provides information on the legal documents (bylaws, budgets, fees, permits, liability and incorporation) involved in the process.

## **Cooking Classes**

One of the greatest hindrances to buying fresh produce, evident from firsthand observation and collected survey responses, is that people are uncomfortable with preparing it. Thus, one of the most effective ways of encouraging produce consumption is to instill confidence in the kitchen. At the farmer's market an effective way of encouraging people to purchase fruits or vegetables unfamiliar to them is to provide cooking demonstrations that utilize these foreign foods. At multiple markets this past summer an employer at Bright Spot Ventures would set up a table directly next to the sale tables. They would then grab produce directly off racks and prepare a simple, fresh meal before the patrons. Often these meals were salads or side dishes that could be prepared within a span of 5-10 minutes, required minimal tools and included more than four different types of fruit or vegetables. Patrons were then encouraged to take samples of the prepared food and provided with recipe cards so that they could recreate the dish. Sales increased greatly due to these demonstrations, especially the sales of produce that patrons had otherwise avoided due to unfamiliarity in taste or preparation measures.

Service centers can also assist in fresh produce consumption by integrating more cooking classes into their event calendars. These classes would involve learning how to shop for food, a review of the appliances or tools used in the kitchen, and visual demonstrations of how to prepare well-balanced meals. Classes would need to be catered to what the participants of the class have or desire to learn how to prepare. Those living at a senior center, for example, are often provided with meals by the center and so a stovetop or oven may not be included in their living arrangements. Despite this, many still have a desire to cook alternative foods so instruction in these cases should focus on dishes that can be prepared without major appliances or the

cooking of raw vegetables or fruits. If at a WIC Center, the mothers may have access to full kitchens but want to learn how to prepare nutrient-rich dishes that their children will eat so those requirements need to be taken into consideration. Classes should also discuss methods of cost-effective and nutritious shopping. By providing shopping lists or recipes, those being serviced can more effectively shop for ingredients and continue preparing meals beyond the class.

## **Chapter 7**

### **LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH**

#### **Limitations**

Limitations arose throughout my study. In the initial development stage, the purpose and specific aspects of my experiment were constantly evolving. From analyzing the efficiency of fresh food programs, to focusing solely on the consumer base that received nutritional assistance from government programs, to the eventual study, which analyzed community desires; the exact purpose was not solidified until survey creation and administration had already begun. Therefore, the questions in the survey were not specifically catered to the final study, making conclusions not as definitive as they could have been.

Among participants, there were multiple issues that could have affected collected data. Offering an incentive may have caused some participants to complete the survey without regard to the accuracy of their responses in order to receive the incentive faster. Some participants even left questions blank that they considered too long to read, were not applicable to them, or did not want to answer, eliminating their contribution to the data entirely. Patrons who had limited time at the market may have also completed the survey at a faster pace than they would have had they had more time to understand each question, leading to data inaccuracies.

The administration of the survey also posed problems. The survey was administered during mobile market stops and at farmer's markets. Working for Bright Spot as a Service Learning Scholar meant that my first duty was to be an employee: to

manage the markets and provide efficient customer service to patrons, often in crowds that outnumbered the amount of employees available. Administering a survey required me to step away from my duties and speak with the participant for however long it took to understand the purpose of the study and their rights in completing the survey. When they had completed the survey I needed to collect the form and distribute incentive. Throughout the process I needed to stay close for any questions the participant may have had, which made it difficult to restock produce if supplies were in an alternative location or to help customers for extended periods of time. The entire process took roughly ten minutes. Due to the nature of the survey distribution process, I was unable to distribute as many surveys as I had aimed to collect. This meant that I was unable to draw hard conclusions from the data. The sample size also means that there were many patrons whom the study failed to reach due to issues of time and convenience. Therefore, various collection issues were truly detrimental in drawing conclusions for my study.

### **Recommendations for Future Research**

The overall objective of the study was to determine what fresh food programs are desired by members of New Castle County, Delaware. While a small sample size hindered conclusions on which programs were the most desired per location, nearly all participants were interested in greater diversity in the fresh food programs than those already provided. Therefore, the findings of the survey suggest the need for policy review, which will enable diversification of the food systems in the county.

To generate achievable policy development targets, future research and further community assessments need to be facilitated in New Castle County, Delaware. By

expanding the survey participant base beyond those who already frequent farmer's markets in the area, a more conclusive study on what programs will be most successful can be conducted. Results from research of that magnitude will better inform local policy makers and lead to the greatest social benefits in the county.

This study has provided insight into how members of New Castle County, Delaware view specific fresh food programs, and their desires to integrate even more programs into their communities. Public policy makers or local businesses should consider the implications of the study that exhibit just how widespread nutrition-consciousness is among community members. In addition to promoting preexisting programs, this new awareness can be used to develop and integrate future programs around the county, positively impacting health and local preference alike.

## **APPENDIX**

### **Survey Questionnaire**

*(for formatting purposes, survey begins on the following page)*





**Consumer Accessibility to Fresh Food Survey**  
**Department of Applied Economics and Statistics**  
**Bright Spot Ventures - Service Learning Scholar**  
**Program 2015**

DATE \_\_\_\_\_

LOCATION OF SURVEY/SURVEY # \_\_\_\_\_

**1. When shopping for food, how frequently do you use each of the following:**

**a. Grocery store (i.e. Superfresh, Walmart)**

Often      Sometimes      Rarely      Never

**b. Convenient store (i.e. Kiosk, Corner store)**

Often      Sometimes      Rarely      Never

**c. Farmers market**

Often      Sometimes      Rarely      Never

**d. Mobile market**

Often      Sometimes      Rarely      Never

**2. How often do you do the food shopping in your household**

Often      Sometimes      Rarely      Never

**3. How often do you buy fresh produce?**

Often      Sometimes      Rarely      Never

**4. The following are possible reasons why you might not buy fresh produce. For each statement please give your level of agreement:**

**a. I do not know where to buy it**

Strongly Agree    Agree    Disagree    Strongly Disagree

**b. Lack of transportation**

Strongly Agree    Agree    Disagree    Strongly Disagree

**c. I do not have the time**

Strongly Agree    Agree    Disagree    Strongly Disagree

**d. It is too expensive**

Strongly Agree    Agree    Disagree    Strongly Disagree

**e. My family/I do not like the taste**

Strongly Agree    Agree    Disagree    Strongly Disagree

**f. I do not know how to prepare it**

Strongly Agree    Agree    Disagree    Strongly Disagree

**g. I do not have the means of preparing it**

Strongly Agree    Agree    Disagree    Strongly Disagree

**h. Other reason \_\_\_\_\_**

**5. In your own community, how interested are you in each of the following programs?**

**a. Nutrition classes**

Very Interested    Somewhat Interested    Uninterested

**b. A neighborhood garden**

Very Interested    Somewhat Interested    Uninterested

**c. A mobile market**

Very Interested    Somewhat Interested    Uninterested

**d. A farmer's market**

Very Interested    Somewhat Interested    Uninterested

**e. Classes on cooking locally grown food**

Very Interested    Somewhat Interested    Uninterested

**f. Other interest \_\_\_\_\_**

**6. How will you pay for any purchases made today at the farmers market? (Circle all that apply)**

Cash    Credit/Debit    EBT    Senior Center Token  
Food Bank Token    No Purchase

**7. Do you receive benefits from any of the following government programs?**

**a. Supplemental Nutritional Assistance Program (SNAP)**

Yes      No

**b. Temporary Assistance for Needy Families (TANF)**

Yes      No

**c. Supplemental Nutrition Program for Women, Infants, and Children (WIC)**

Yes      No

**e. Other \_\_\_\_\_**

**8. Area of residence**

- a. Urban   b. Town   c. Suburban   d. Other

**9. Year of Birth \_\_\_\_\_**

**10. Do you consider yourself Hispanic or Latino?**

- a. Yes, Hispanic or Latino (including Spain)  
b. No

**11. Regardless of your answer to the prior question, please indicate how you identify yourself. (Check all that apply)**

- a. White (including Middle Eastern)  
b. Black or African American (including Africa and Caribbean)  
c. American Indian and Alaska Native  
d. Asian (including Indian subcontinent and Philippines)  
e. Native Hawaiian and Other Pacific Islander  
e. Other \_\_\_\_\_

**12. What is the highest degree or level of school you have completed? (If currently enrolled, highest degree received).**

- a. Nursery school to 8<sup>th</sup> grade  
b. Some high school, no diploma  
c. High school graduate, diploma, or the equivalent (i.e. GED)  
d. Trade/technical/vocational training  
e. Some college credit, no degree  
f. College graduate or more

**13. Please indicate which category best reflects your current family income:**

- a. Less than \$25,000  
b. \$25,000-\$49,999  
c. \$50,000-\$99,000  
d. More than \$100,000

**Thank you for responding!**

Please accept this \$1 in redeemable "Bonus Bucks."

After a \$1 purchase at the mobile market, you will receive an additional \$1 to spend on produce, free!

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