

A Multiple Perspective View of a Farmer's Market Gleaning Program on Fruit and Vegetable Access in a Food Desert

Jacqueline Lanier and Julie Schumacher

Abstract

The objective of the study was to understand, through multiple perspectives, how gleaning from a local farmer's market can improve access to fruits and vegetables in low income neighborhoods. Gleaning is simply defined as the act of collecting and donating excess foods that would otherwise go to waste. This study employed a mixed method approach including a survey of volunteers, a survey and key informant interviews of farmers, and interviews with neighborhood residents. Qualitative research took place with farmers at a local farmer's market in the Midwest and with residents living in food desert neighborhood who benefited from the gleaned produce. Quantitative data was gathered through online surveys. Participants included the farmers who donated produce, the volunteers who gleaned from farmers and distributed to the community residents, and the community residents who picked up the produce. Farmers, volunteers, and residents all supported the gleaning program as a beneficial way to provide fresh produce to low income residents. The program assisted in the utilization of excess produce that would have otherwise been thrown out, thus cutting down on food waste. Through the initiative of establishing more farmers' markets in the United States, there are opportunities to develop gleaning programs. The efforts of gleaning can reduce food insecurity and food waste in an attempt to eliminate food deserts.

Key Words: Gleaning; Farmer's Market; Food access; Food insecurity; Food Desert

Introduction

Over 6.4 million households experience food insecurity, yet the United States wastes 30-40% of the food it produces each year (USDA, 2014). Food losses occur during all levels of the food system. Losses can happen before harvest due to weather, disease, and animals, during harvest due to mechanical harvesting and production practices, and during storage due to mold, deterioration, shrinkage, and spoilage. Fresh produce

is removed from the consumer food market system when it does not meet minimum quality standards due to it being cosmetically damaged. This occurs even if it is safe to eat, which creates food waste (Vogliano & Brown, 2016).

Food deserts are areas where affordable, quality, and nutritious foods are inaccessible (USDA, 2014). Food deserts often contain more convenience stores and gas stations that sell high-calorie, high-fat food to the public and generally do not offer produce. One study discovered fruit and vegetable consumption was lower in individuals who lived in a food desert versus individuals who did not, even when education on healthy eating behaviors was a factor that was controlled for (Blanchard & Matthews, 2007). Because of the unhealthy foods that are offered in food deserts, not only are individuals more likely to be obese when living there, but they also have a higher risk of having diabetes, cancer, and heart disease (Chen, Jaenicke, & Volpe, 2016).

Community food security pays close attention to the social, economical, and institutional components of a community that affects individuals' or residents' ability to obtain a certain quantity and quality of food at an affordable price, including limited access to fresh produce. In 2013, it was believed 14.3% of households in the United States were food insecure, with 5.6% of households being extremely food insecure. In total, this calculates out to about 17.5 million households, many of which are located in food deserts (Ramsey, Simpson, Wallace, & Werra, 2014).

One specific study measured the association between dietary outcomes and the neighborhood food environment. The neighborhood food environment was captured by creating a 0.5-mile and 1-mile network distance around each participant's home and the closest grocery store/convenience store/farmer's market/produce stand. Results indicated that participants who lived within 0.5-miles of a store, farmer's market, or produce stand had higher consumption rates of fruits and vegetables (Gustafson, Lewis, Perkins, Wilson, Buckner, & Vail, 2013).

Gleaning, simply the act of collecting and donating excess foods, helps simultaneously address the important issues of community food insecurity and food waste. It increases access to produce to ultimately increase consumption (USDA, 2014). Food recovery occurs when food is collected from the fields of farmers, retail stores, or other food establishments in order to be donated to those in need by delivering them to food pantries, soup kitchens, or food banks. While some states have larger organizations with employees to help with food recovery programs, many rely on smaller, local organizations with volunteers. Food recovery not only provides more food for those who need it, but it also provides an improvement in their diet by providing diversity of foods and important nutrients such as vitamins, minerals, and fiber. Farmer's markets play an important role in contributing to community food security (Montezuma & Mouw, 2015).

*Jacqueline Lanier, DrPH, MCHES: Assistant Professor, Department of Health Sciences, Illinois State University, Campus Box 5220, Normal, IL 61790; Email: jalandie@ilstu.edu; Phone: 309-438-8285; Eta Sigma Gamma – Omega Chapter; Illinois State University.

Julie Schumacher, EdD, RD, LDN: Associate Professor, Department of Family and Consumer Sciences, Illinois State University, Campus Box 5060, Normal, IL 61790; Phone: 309-438-7031

*Corresponding Author

The act of gleaning is a collective effort that takes coordination, knowledge and time to plan the gathering of excess fresh produce from farmer's markets, grocers, restaurants, state/county fairs or other food establishments in order to provide access to fruits and vegetables to those who do not have them. The USDA has a gleaning toolkit that offers the following steps to develop a gleaning program: 1. convince potential donors to get involved, 2. recruit volunteers for a gleaning team to help make the program a success, 3. prepare for your first glean, and 4. Make the program sustainable (USDA, 2014). A gleaning program builds good relationships between community members, local gardeners, and farmers. Gleaning can be used in order to reassure food security within an area by providing fresh, accessible, affordable fruits and vegetables in an appropriate quantity and quality. It also helps reduce food waste and provide sustainable agriculture, which can benefit the environment (Almquist, 2012).

Gleaning programs exist in many different cities in the United States. In the Heartside neighborhood in Grand Rapids, Michigan, the Heartside Gleaning Initiative works with the Fulton Street Farmer's Market to glean extra produce and herbs from the vendors and farmers every Saturday once the market closes for the day. The gleaned food is then taken to homeless shelters, food pantries, or soup kitchens to be distributed to residents and individuals living within the Heartside neighborhood community. While assessing the success of the program, 70% of participants reported using all of their produce, with 20% of participants stating they had more than they could use, and 10% of participants not knowing what they could do with it. Eighty-seven percent of the participants shared some food with others (Kuhl, Tuttle, & Villarreal, 2014).

In Oxford County, Maine, a gleaning program known as Maine Harvest for Hunger exists, as 13.2% of the population in this country lives below the poverty line, but 35% of the population here who suffer from food insecurity make too much money to qualify for food stamps. This program uses gleaning from farmer's fields, gardening projects, and donations from Master Gardeners to provide fresh fruits and vegetables directly to individuals, along with nutrition education. While some of their food is donated to food pantries, survey research indicated that some of these food pantries could not keep the fresh produce due to irregular hours, inadequate storage and refrigeration space, and lack of knowledge of preparation by participants. Because of these limitations, Master Gardens planted a $\frac{3}{4}$ -acre garden that was harvested in order to provide individuals or residents of this county access to fresh foods each week and 90-120 people were fed. Results of program assessment showed 92% of the participants' diets had improved, and 94% of the participants' nutrition knowledge had improved. Participants tried to include healthy foods into their daily diets with 82% of the participants reporting making more homemade meals, and 95% of the participants tried wider variety of fruits and vegetables (Murphy, 2013).

While some farmer's markets do know where to go to donate to nonprofit and gleaning organizations, and some nonprofit and gleaning organizations do know where to go to find farmer's markets in the area, more coordination and cooperation is needed to increase food recovery and increase relationships between farmers and organizations. Every person in the United States could have a meal if just 30% of the food that is wasted in the United States is collected before it is

thrown in the trash (Gunders, 2012).

The purpose of this study was to assess a gleaning program from three perspectives: the farmers who donate produce, the volunteers who glean from farmers and distribute to the community residents, and the community residents who pick up the produce. The USDA toolkit served as a foundation to developing the gleaning program. The objectives of the study were 1. To assess how gleaning from a local farmer's market can improve access to fruits and vegetables in a low income neighborhood, 2. To identify the perceptions of neighborhood participants and volunteers participating in a farmer's market gleaning program on fruit and vegetable access, and 3. To identify the perceptions of the farmer's providing free produce to a farmer's market gleaning program on increasing access to fruits and vegetables.

Methods

Program Design

The farmer's market gleaning program consisted of collecting the excess fresh produce from the farmers at the market and providing it to those in need. Residents were the recipients of leftovers from the market that were not sold and may otherwise go to waste. The program was a collaboration between the several community based organizations, a local wellness coalition, and the Farmer's Market. The Midwestern city in which the program took place has a population of about 77,000. The predominate races of the population are White (76%), African American (10%), Hispanic (5%), and Asian (7%) (U.S. Census Bureau, 2010). About 13.4% of the population has noted being food insecure. The Farmer's Market ran every Saturday morning from early May until mid-October. Volunteers were recruited to glean at the end of every market and then take the produce to one of two community sites. The community sites were in lower income neighborhoods that were considered to be food deserts. A variety of free locally grown produce was available at the sites. Volunteers provided recipe cards to participants that picked up produce as well as educational materials relating to preparing, storing, and nutritional benefits of the produce.

Participants

This study employed a mixed method approach including a survey of volunteers, a survey and key informant interviews of farmers, and interviews with neighborhood residents participating in the farmer's market gleaning program. All instruments were reviewed by experts who considered interpretability, clarity, construct, and face validity of the instruments utilized. Volunteers for gleaning and distribution were recruited through the local wellness coalition, marketing on Facebook, and through community contacts. Within a few days after volunteering they were sent an e-mail with a link to an on-line survey to complete via SurveyMonkey™. Volunteers were asked questions related to type and amount produce gleaned and distributed, number of residents who obtained produce at the distribution, opinion on impact of program on residents, and any other suggestions for improvement and feedback.

Farmers were recruited with the help of the local Farmer's Market Manager. The survey was sent via e-mail by the Market Manager to all 20 farmers that participate in the farmer's market. The e-mail contained a link to an on-line survey to

complete via SurveyMonkey™. Farmers were asked questions related to the importance of the gleaning program and donating their excess produce, and ideas on additional ways they could work to provide access to fruits and vegetables to low income residents. For the farmers' interviews, a separate e-mail was sent to the Farmers by the Market Manager asking if they would be willing to be interviewed. An interview guide was developed and administered by the researchers. Answers were recorded manually. Farmers were asked questions related to opinions of program impact on fruit and vegetable access in low income areas, other ways they promote fruit and vegetable access to low income residents, and importance of donating their excess produce.

Residents were recruited at the distribution sites, and the researchers administered the interviews using a question guide. They were asked questions related to fruit and vegetable intake, awareness and usage of farmer's markets, family behaviors, access to fruits and vegetables, and importance of eating fruits and vegetables. There were a total of 19 questions asked of residents including 4 scaled questions, 5 multiple choice questions, and 10 open ended response questions. Answers were recorded manually by the researchers.

Data

A secure EXCEL file database was used to capture all responses to the surveys and interviews. The database included transcribed notes from interviews and notes of researchers. The interview tools contained open-ended and closed-items. For open-ended items, a coding frame was generated based on a thorough examination of all output. The coding frame consisted of key concepts and co-occurring concepts. The key constructs are fruit and vegetable intake, awareness of farmer's market, access to fruits and vegetables, program impact, and importance of eating fruits and vegetables. The frequency and percent of occurrence for each concept was tabulated manually. Closed-ended items were analyzed using descriptive statistics.

To address issues related to study quality, several strategies were employed. The study utilized various sources of data from three types of respondents. This multiple collection of data was triangulated to produce evidence that corroborates the purpose of the study. Several key informants from the study were asked to review the final report to reduce bias on part of the researchers. Pattern matching was utilized centered on the key constructs in this study.

Results

Volunteer Survey

Gleaning and distribution took place on twenty-six Saturdays, May 2015 through Oct 2015. All twenty-nine volunteers completed the volunteer survey. Many volunteers volunteered more than once. Based on the reports of the volunteers, approximately 5750 pounds of produce was gleaned from the farmer's market and distributed during the 2015 season. On average 30 residents were provided free produce each week and many took produce for friends, family, or neighbors. If there were leftovers, the food was taken to the local homeless shelter.

All (100%) volunteers thought the program helped residents by increasing access and consumption of fruit and vegetables. One volunteer said, "cooking with good, healthy, fresh food is a passion of mine - so to help ensure that all people have access to good, fresh produce is important to me. When something is free, people will be more apt to try something new. Maybe they'll like it, maybe they won't. But they are trying it. Hopefully they'll get into habits of using fruits and veggies and encourage the children in their lives to open up to them too." All (100%) volunteers saw the program as a way to connect with residents over food and nutrition. One volunteer noted, "it was great to not only give away the food but also share recipes with residents on how to prepare the food. I've learned from them, and they've learned from each other too." Volunteers noted many reasons why they volunteered including a passion to help others, to give back, great opportunity to help in the community, and an interest in food security. One volunteer said, "I love fresh food and am now in a position in my life to be able to afford it and access it. For a time, I could not afford it and worked at a food co-op to receive food in exchange for my labor. So I guess I understand what it means to have a lack of resources and access to certain types of food, and love opportunity to give back. Plus, I really like talking to people about food!" Another volunteer noted, "I like volunteering in the community with my daughter. It gives us time together, gives her a different perspective, and we both feel good about volunteering."

Volunteers did have suggestions on how to improve program with more recipes, labeling of food items, and increasing marketability of program with better signage and by reaching out to residents living close to distribution sites. In addition, some volunteers noted that residents picking up the food were often unaware where it came from, that is was local, and from farmers at the Farmer's Market. However some volunteers thought the program was "perfect" and liked the informal nature of the program. One volunteer noted, "this was a wonderful experience. It was great to see community members having access to fresh foods right in the center of their neighborhood. I think the informal nature of people being able to browse and help themselves was great."

Interviews of Farmers

A total of five farmers out of 20 that were asked were interviewed in person or via phone. Many farmers stated that there is always excess produce left on their farms, and they are happy to have it go to residents who are in need. A theme that emerged from the farmers was that increasing education around the importance of consuming fruits and vegetables as well as how to cook and prepare the produce can be just as important as providing the fruits and vegetables. Many farmers thought that farmer's markets enhance community connections among farmers, community members, and local businesses. One farmer stated, "I love the opportunity to interact with people at the farmer's market and share with them what I do." However, they think the farmer's markets are underutilized. "Farmer's markets still are not drawing the numbers that we would like to see," as stated by one farmer.

Surveys of Farmers

An on-line survey was sent to 20 farmers of which 11 completed the survey; a response rate of 55%. Eighty-nine percent of the farmers said that they accept WIC coupons, and 70% of farmers agreed or strongly agreed that accepting these coupons has a positive impact on fruit and vegetables access in low-income areas. Eighty percent of the farmers agreed or strongly agreed that overall, the gleaning program is useful in helping to increase access to fruits and vegetables in low-income areas. When it comes to donating excess produce to local food pantries or community organizations, 90% of farmers agreed or strongly agreed that these donations are important to their farm.

Interviews of Residents

A total of 79 residents were interviewed on 11 of the Saturdays that distribution took place. The majority of residents interviewed noted that they do not utilize farmers markets very often with an average rating of 2 from residents on a scale of 1- never utilize, to 5- very often utilize. For those residents that said they never utilize the farmer's market, they were asked why. Many of those residents noted "too pricey" and "not a convenient time." Most residents believe eating fruits and vegetables is very important with an average rating of 4.8 from residents on a scale of 1- not very important, to 5- very important. One resident noted, "I saw you distributing when I got off the bus. This is my first time, and I plan to return. I am diabetic and have been told I need to eat more greens. This is so helpful because I am not sure I'd have any idea what to do with some of the food without your recipes." When asked about ease of access to fresh fruits and vegetables, residents on average noted a rating of 3 on a scale of 1- very hard to 5- very easy. The majority of residents noted that they buy most of their food at larger grocery stores, with several noting getting food from food pantry's or "dollar stores." Several residents noted that "now we get our veggies at these distribution sites." Sixty-two percent of residents did not think a grocery store was too far, however 38% noted a grocery store was too far from their home. The three main ways that residents traveled to a grocery store were by car, ride with a friend, or the bus.

Residents appreciated and were thankful for the free produce based on the many comments received during interviews and to volunteers. One resident said, "thank you for providing this. It helps feed so many people in our neighborhood." Another resident stated, "this food helps to stretch my small food budget for all of the mouths that I feed." Some residents noted getting items for free was a way to try items never eaten before which may lead them to buy those items in the future. One resident noted, "my kids are trying foods they never have had before thanks to this program. I could not afford them otherwise." In addition, one gentleman said, "my wife and I will always find a way to cook fresh produce when she has it. We have even taken things we weren't familiar with like kale and kohlrabi and with the recipes you have provided we knew how to cook it."

Discussion

The results of this study conclude that gleaning programs can be an effective way to improve fruit and vegetable access in a known food desert, where buying fresh healthy foods is difficult due to availability and cost. Through this type of

program, residents can be encouraged to try healthy items they many have never eaten before. For farmers, it helps to provide a consistent place for excess produce to go and prevent food waste. In addition, it can promote what farmers do in the community helping community members understanding of food sources. Volunteers participating in the gleaning and distribution provides a way to connect with residents over food, recipes, and empower each other with additional knowledge on healthy foods. Gleaning programs can provide a way for volunteers to give back to the community and support residents.

Farmers, volunteers and residents build better relationships through this type of program, empowering all groups through increased access to healthier foods. Gleaning programs can be easy to begin (USDA, 2014). It is easily replicable in other communities with farmer's markets by using the USDA gleaning toolkit as a guide to get buy in from local partners. One can start by first finding a farmer's market, community garden, or personal farmer, along with visiting local restaurants, supermarkets, and other food distributors and sellers. It is important to educate these individuals and organizations on the benefits of gleaning. Next, creating public awareness of the program is essential while publicizing to the farmers, individuals and organizations donating to the cause.

A gleaning program does takes coordination and effort among many different individuals and groups including volunteers, community agencies, farmers, local farmer's markets, and residents (USDA, 2014). Having a central organization or key contact linking the farmer's market to volunteers and then to the community was helpful in the program studied here. Farmer's markets were a key partner in the studied gleaning program to get buy-in from the farmers. Twenty-five percent of farmer's markets team up with food recovery organizations to partake in gleaning programs which provide fresh food to families in need. They contributed one million pounds of donated food, which averages out to 5,900 pounds of food per market (Thilmany & Watson, 2004).

Volunteers are also able to support the farmers they glean from by influencing purchasing power at grocery stores and supermarkets by encouraging others to buy more locally grown produce (Almquist, 2012). They participate in this type of program because they care about increasing access to healthy foods and the work the farmers do. Volunteers who are passionate about the program inspire others around them and are key to helping make the program a success. As noted from this study, volunteers found it not only a beneficial program for residents but also a positive experience for them and a way to give back to community. They can be recruited through social media or by posting on community based organization websites. Meetings can be set or discussion forums can be created online in order to create measurable goals and ideas. A volunteer survey can be created to find out special skills and abilities, and volunteers can easily be educated on food handling, food safety, and basic nutrition education.

It is important to find volunteers who can glean on a regular basis in order for them to develop positive relationships with the residents, farmers, and community based organizations. Gleaners should also handle produce with care and respect, and they should be on time. During the gleaning process, it is crucial to have enough crates, boxes, and reusable bags available, which need to be labeled. Ideally, it is important to inform the individuals or organizations of where the food is

being donated or distributed to, along with weighing the food obtained and providing a receipt in order for farmers to use it as a tax write-off at the end of the year. In addition, if gleaning from a farmer's market, it is vital not to rush farmers at the end of a long day near closing time (USDA, 2014).

Through the initiative of establishing more farmer's markets in the United States, there are opportunities to develop gleaning programs. The efforts of gleaning can reduce food insecurity and food waste in the attempt to eliminate food deserts. Through the action of gleaning, excess fresh produce and fresh food products can be collected from venues such as farmer's markets, re-distributed, and donated to those in need. Gleaning allows for greater access to healthy foods in order to create a balanced and varied diet for neighborhood residents.

Conclusion

Overall the results illustrate that volunteers, farmers, and residents all supported the gleaning program. It was viewed as a beneficial way to provide fresh fruits and vegetables to low income residents. It helps simultaneously address the important issues of community food insecurity and food waste. The program assisted in the utilization of excess produce that would have otherwise been thrown out, thus cutting down on food waste. Not only did the program provide produce to those in need, but also created an avenue to promote the benefits of fruit and vegetable consumption. A program such as this can be easily replicated in other communities by building relationships with community residents, farmer's market manager, and farmers.

The authors declare that they have no conflict of interest.

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