

A Farmers' Market in a Food Desert: Evaluating Farmers' Market Effects on Food Accessibility in Richmond, CA

Lian M. Boos

ABSTRACT

Food deserts, areas where residents find it difficult to find healthy, affordable foods, contribute to rising levels of obesity and diet related diseases in many urban areas. Farmers' markets have emerged as an approach to improving food accessibility in food deserts, but little research has been done on their effectiveness in addressing food insecurity in food deserts. I used GIS to identify a farmers' market in Richmond, CA that was located in a food desert, and surveyed its customers to determine whether it was an effective means of providing healthy foods to a local population that would otherwise lack food accessibility. Customers who lacked access to healthy food without the farmers' market purchased a greater percentage of their food at the farmers' market than those who had access ($p < .05$). Customers who lived closer to the market used the market more, and tended to have income levels relatively lower than other customers. This market was so accessible to its customers because of its proximity to many customers' places of work, the diversity of its customer base, and most importantly, the affordable price of its produce. Most of the vendors at the market sell a product that is chemical free, but not organic certified, allowing them to maintain an affordable product for their customers. The findings of this study have implications not only for the effectiveness of farmers' markets in addressing issues of food accessibility, but for how to make future markets the most accessible.

KEYWORDS

Food environment, food desert solutions, food insecurity, survey, urban environments

INTRODUCTION

Obesity is an epidemic in the United States, and as rates continue to rise, the effect of the food system on the health of Americans has been called into question. Since 1980, the percentage of obese adults has doubled, and that of obese children has tripled (Flournoy 2011), and health issues closely linked to diet and obesity, such as diabetes and heart disease, are also becoming more prevalent (Levi et al. 2009). Neighborhoods lacking access to healthy food sources tend to have higher rates of obesity and diabetes (Jilcott et al., 2011), suggesting that the food environment of a neighborhood affects the health of its residents (Giang et al. 2008, Hawkes 2008). The term “food desert” is used to refer to neighborhoods without access to the healthy, affordable foods necessary to maintain a healthy lifestyle (Hawkes 2008, Walker et al. 2010). Low income, minority neighborhoods are the most at risk communities, so the definition of a food desert is often taken to be a community of low-income minority residents with little access to healthy, affordable foods (Breneman 2011, Walker et al. 2010). These issues make the identification and remediation of food deserts not only a health concern, but an issue of social justice as well.

As concern over the multitude of issues associated with food deserts rises, many parties have sought to provide new sources of food, and it has become important to ask which methods are most effective. Food policy councils have assembled to work toward changes in the policies governing the food system, and non-profit organizations have developed an idea of community centered around the growing of food by promoting local, urban agriculture (Kantor 2001). While some efforts have focused on opening new grocery stores in low-income areas, others have reclaimed unused urban areas for community gardens, starting community supported agriculture systems, and opening farmers' markets (Flournoy 2011). Food support programs, like the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) are another prominent approach to reducing dependence on emergency assistance providers (Jones & Bhatia 2011, Tester et al. 2011). Each of these efforts is working toward creating a more “equitable food environment” devoid of food deserts and food insecurity, where people have equal access to the same healthy food opportunities. Presently there are many non-profit organizations and government initiatives dedicated to increasing food security and creating an equitable food environment, where everyone has access to affordable foods necessary to sustain a healthy diet

(Kantor, 2001). However, there has been little research evaluating the effectiveness of these approaches, which would help to inform how activists approach future efforts towards the remediation of food deserts (Larsen & Gilliland, 2009, Walker et al., 2010)).

Farmers' markets possess many qualities that are conducive to bringing food accessibility to food deserts, but there are also potential barriers to customers accessing a farmers' market. Farmers' markets are a good source of fresh, local, and healthy foods, they are flexible in their location, and they don't require a permanent structure, making them a good tool to improve food accessibility (Kantor 2001). Because of this, some farmers' markets have been located in urban food deserts in order to improve access to healthy foods for low-income residents that would otherwise have limited access to healthy foods (Alkon and Norgaard 2009). However, farmers' markets have also been an important tool in the recent food movement, as an alternative to purchasing foods from supermarkets whose products are dominated by the industrialized food system (Alkon 2008). They support local farmers who practice sustainable agriculture, as opposed to the questionable practices and ethics of the big corporations that dominate the current food system, and are often more focused on providing organically certified goods than keeping their prices affordable (Alkon 2008, Brown 2002). Sustainable practices can come in several forms, including soil management, restricting chemical use, and regulations on post harvest handling. While some farmers may employ select sustainable practices, in order to attain a organic certification, they must subscribe to a lot of regulations that are much more laborious and expensive to maintain (Padel and Foster 2005), thus raising the price of their product, and catering to a customer base that has the financial luxury to overlook price for their ethical values (Hall 2011). Many studies have asserted that the culture of these markets, in addition to the price is inaccessible to a low income, minority population (Alkon and McCullen 2010, Slocum 2012).

Research has not shown whether locating a farmers' market in an area that has been identified as a food desert ensures an increase in food accessibility. The USDA has recently launched a program called the Farmers' Market Promotion Program that made available 10 million dollars in grants to expand and create farmers' markets (Farmers' Market Promotion Program 2012); so exploring the potential of this approach is crucial. Knowing the barriers that exist to market accessibility, and the potential for market creation and expansion through the Farmers' Market Promotion Program, it is important to evaluate effectiveness of farmers' markets on increasing food accessibility in urban food deserts.

I assessed the effectiveness of farmers' markets for low-income residents of food deserts in Richmond, California. By examining the “food environment,” or the nature of the food sources available in this community, I determined whether farmers' markets located in food deserts are effective in improving accessibility to foods for low-income residents. I first identified markets located in areas of high food insecurity. Then I documented the actual consumer composition at these markets, to determine if those in need of food access are actually shopping at the market. I hoped to answer the following questions (1) is the market serving customers who would otherwise not have access to healthy foods, and (2) is the market having an effect on residents of neighborhood in which it is situated? I expected to find that a strategically placed farmers' market would improve food access to the neighborhood in which it was located.

METHODS

Study population and study site

I surveyed customers at a farmers' market in a Richmond, CA food desert to assess the markets' effect on food accessibility in the area. The survey allowed me to document customer perceptions of their food environment, food purchasing habits and demographics.

GIS data collection

To identify a market that was located in a food desert, I used GIS to look for overlap in the areas that supermarkets and farmers' markets were serving. I mapped supermarkets by filtering the InfoUSA dataset of all the businesses in California to only represent large grocery stores in Richmond, CA. I then mapped farmers' market locations using a USDA spreadsheet of farmers' market information that I processed for geocoding in GIS. To identify the area of service for both supermarkets and farmers' markets, I used a street network dataset (TeleAtlas) to perform a network analysis by measuring an area (or buffer) of 0.5 miles along roads from the food source. All homes within the 0.5 mile buffer were considered to have access to that particular farmers' market. Farmers' markets that were located in food deserts would have

ranges of accessibility that did not overlap with other sources of food. After performing this network analysis for both supermarkets and farmers' markets, I determined that farmers' markets with less than a 25% overlap with supermarkets were located in an area that was a food desert.

Surveying market customers

To document customer demographics, and identify correlations between demographic groups and their shopping habits and preferences, I conducted a survey of farmers' market customers at the Richmond Certified Farmers' market, which had less than a 25% overlap with the area of accessibility of surrounding food sources. The market is located at 24th Street and Barrett Avenue in Richmond, CA, which is open every Friday, year round, from 9 AM to 2 PM. I collected 120 surveys, 96 of which were fully completed and usable, on three separate Fridays in February and March 2012 between the hours of 10 AM and 1 PM. To ensure a representative sample, I asked every fourth customer who entered the farmers' market to complete my survey.

My survey collected two categories of information: demographic information (occupation, income, education level, race, and the cross streets of their residence, etc.), as well as information on the respondents' food shopping habits, and perceptions of their food environment. I asked questions about purchasing habits at the farmers' market and other food sources, and how customers accessed the market, how they perceived their level of access to be without the market, and how they perceived their level of food insecurity. I anticipated that there would be some variables that had a greater effect on a customers' use of the market. I expected that a successful market would serve a local population of residents, who were predominantly low income, minority customers with a high percentage of their food purchases.

Customer data analysis

Prior to statistical analysis, I prepared my data, and organized it into a useful format. First, I mapped the respondents' places of residence to compare them with the service area that I had identified for the farmers' market. Using these points, I calculated the distance that each respondent lived from the farmers' market. For several of my variables including race, income level, and access to foods, I re-coded them to create new, binary variables that could be used for

chi-squared analysis. For open-ended questions that had a multitude of responses such as the respondents' primary reason for shopping at the market, I looked for similar answers that were worded differently, and re-classified them into new categories in order to narrow down the range of values.

Who is at the farmers' market, and who uses it?

I created summary statistics of the demographic composition of farmers' market customers in my sample, and identified different racial identity and income levels, because these have historically been indicators of a food insecure community. I compared the racial breakdown of customers at the farmers' market with that of the area (using census data) to determine if the customer base is reflective of the Richmond population. I also documented customers' perceptions of their access to food outside of the farmers' market. Additionally, I looked for demographic trends in the percentage of foods that customers purchased at the market because the amount of food purchased at the farmers' market is a more accurate indicator of access to the products sold at the market than simply presence at the market.

Using Chi-Squared tests, I looked for a correlation between percentage of food purchased at the market, and customer income level and race to determine if customers who were low income, minorities, were buying more of their food at the market. I also performed a Chi-Squared test to determine whether there was a correlation between customers' perceptions of access to food without the market, and the percentage of food they purchased at the market. I had asked surveyed customers to indicate whether, without this farmers' market, they felt they would have access to healthy foods. By examining the relationship between this and the percentage of food purchased at the market, I hoped to determine the degree to which this market was serving individuals without access to healthy foods.

Is this market serving a local population?

I examined patterns in the distance that respondents lived from the market using several t-tests. First, I plotted customers' distances to the market in order to determine a more accurate idea of what the market's "range" of accessibility was. I then determined whether the market

was in fact serving the neighborhood in which it was situated, by using a t-test to look for a difference in how far customers who purchased over 25% of their food at the market, and those who purchased less than 25%, lived from the market. I also wanted to determine patterns in customer travel distance to the market by using t-tests to identify a relationship between race, and distance to the market, as well as income and distance to the market. I expected that those who traveled farther to the market would be higher income, white customers who had very different intentions coming to the market than those who lived closer.

Observations and informal interviews

Throughout my visits to the study site, I made many observations, and did several informal interviews with the vendors at the market. The observations I made were mostly about the products being sold, and the vendors, as I documented the price of foods, whether the vendors accepted EBT, and the variety of products that were being sold at the market. Additionally, I observed many of the interactions amongst customers, and between customers and vendors, and I performed informal interviews with each of the vendors at the market to identify their race, and to ask them whether they were organic certified, and if not, what their practices were and why.

RESULTS

Mapping farmers' markets and supermarkets

After comparing currently open farmers' markets with supermarket locations in Contra Costa County, I found a market on 24th and Barrett Avenue in Richmond, CA, that served an area that did not previously have access to supermarkets with healthy food options. The service area of this farmers' market had little to no overlap with the service area of other healthy food sources (Fig. 1). This market, located in a food desert, became the study site for surveying farmers' market customers. It is open Fridays, weekly and year round from 8 AM to 2 PM.

Mapping survey results

The mapped places of residence of surveyed customers did not overlap strongly with the service area that I identified, with only 17.1% of respondents indicating that they lived within a 0.5-mile network of the market (Fig. 2). However, a majority (59.7%) of the customers did live within a 2 mile network of the market.

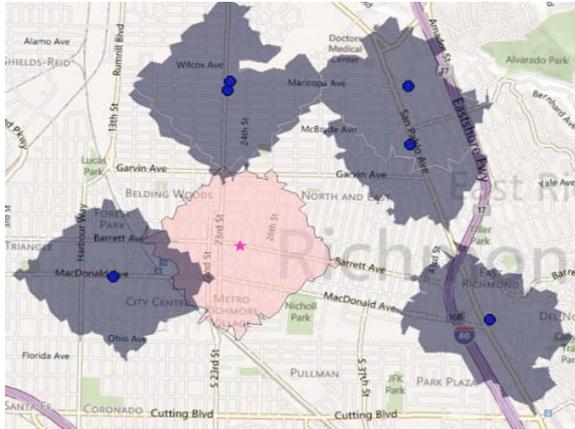


Figure 1. Overlaid service areas of Supermarkets and farmers' markets
Richmond farmers' market is starred, and in pink. Market has less than 25% overlap with surrounding supermarkets.

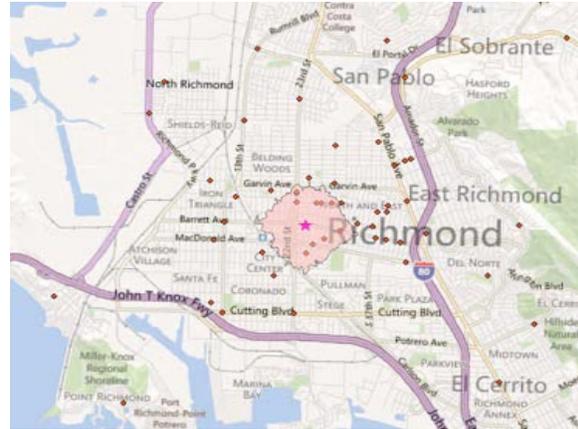


Figure 2. Mapped customer residences
pink indicates farmers' market 1/2 mile service area. Most residences are outside of the service area, but residences get less concentrated as distance from market increases.

Who is at the farmers' market, and who is using it?

There were several interesting patterns in respondents' race and income level. There was a great diversity of ethnicities, with 29% Black, 27% Asian, 21% Hispanic, 18% White and 5% other/mixed. According to Richmond census data, Richmond's population is 26.6% Black, 13.5% Asian, 39.5% Hispanic, and 31.4% White (Table 1). Although 16.8% of respondents neglected to indicate their income, income levels of market customers were centered between <\$30,000 and <\$75,000 (Fig. 3). The majority (62%) of customers had an annual income of less than \$30,000 to less than \$75,000, with very few earning higher than this range. After translating income into income per person in the household, 41.2% of the customers at the market make less than \$15,000 a year per person in the household, and are considered low-income. Of the customers at the market, 53.7% of indicated that they would have access to healthy foods without the market, and 46.3% said that they would have limited or no access to

healthy food without it (Fig. 4). Finally, 57.45% of customers purchased 25% or less of their food at the farmers' market and only 13.8% of them purchased over 50% of their food at the market (Fig. 5)

Table 1. Race of customers at the farmers' market compared with Richmond Census data. Data acquired from US Census Quickfacts <http://quickfacts.census.gov/>

Race	at Farmers' Market	Richmond Population
Black	29%	26.6%
Hispanic	21%	39.5%
Asian	27%	13.5%
White	18%	31.4%

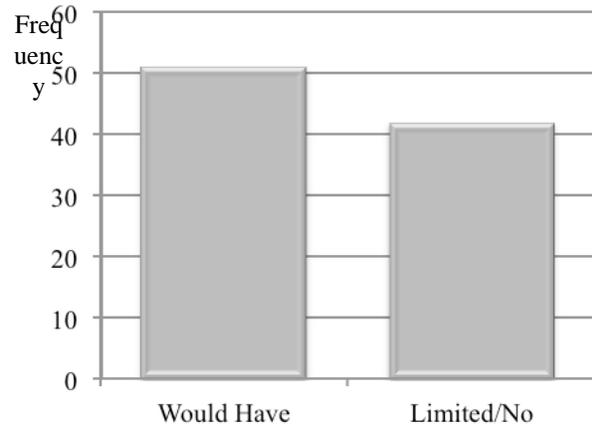


Figure 4. Customer food access without the farmers' market. n=96 46.3% have limited to no access to healthy food, 53.7% do have access.

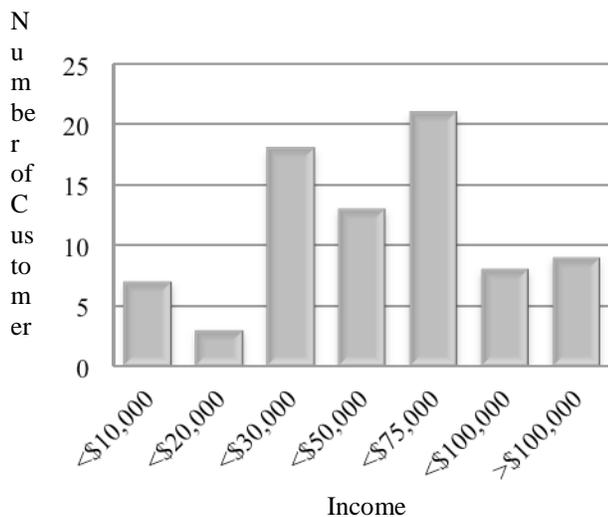


Figure 3. Customers by Income. Most customers have an annual income of between <\$30,000 and <\$75,000, with some customers on the extremes of the spectrum.

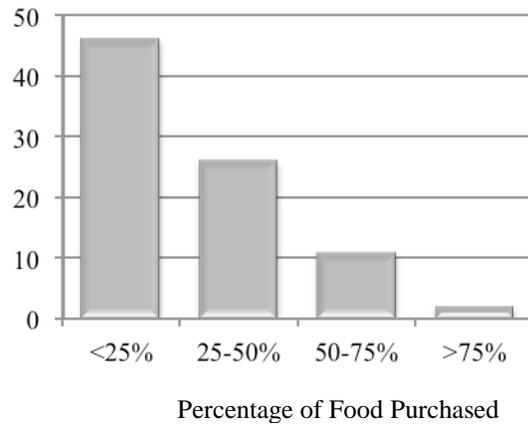


Figure 5. Percentage of food customers purchase at the farmers' market. Very few people purchase over 50% of their food at the farmers' market. About half purchase under 25% of their food there.

Patterns in percentage of food purchased at the market

There was no statistically significant correlation between respondents' race, or income level, and the amount of food that they purchase at the farmers' market, indicating that different races and income levels purchase similar amounts of food there, or perhaps that a difference did not show up due to sample size or survey error. However, there was a statistically significant difference in the purchasing habits of customers who had access to healthy food without the farmers' market, and those who did not (Table 2).

Table 2: Relationships with percentage of food purchased at the market.

	p	Significant?
Minority/White	0.335	No
High/Low Income	0.2224	No
With/Without access to food	0.02382	Yes!

Is this market serving a local population?

Primarily, I found that customers who lived closer to the market were more likely to indicate that they purchased more of their food at the market than those customers who indicated that they lived further away (Fig. 6). Customers who purchased less than 25% of their food at the market lived farther from the market than those who purchased 25-50% of their food at the market ($P=0.03615$), as well as customers who purchased over 50% of their food at the market ($P=0.001177$). However, there was not a statistically significant difference between customers who purchased 25-50% of their food and over 50% of their food at the market. Figure 7 shows the spread of the distances that customers lived from the farmers' market. Additionally, I found that those customers who lived further away were more likely to be high income, and local customers were more likely to be lower income (Fig. 8), with the exception of those earning between \$75,000 and \$100,000. I did not find significant relationships between race and distance to the market, or in access to healthy foods without the farmers' market.

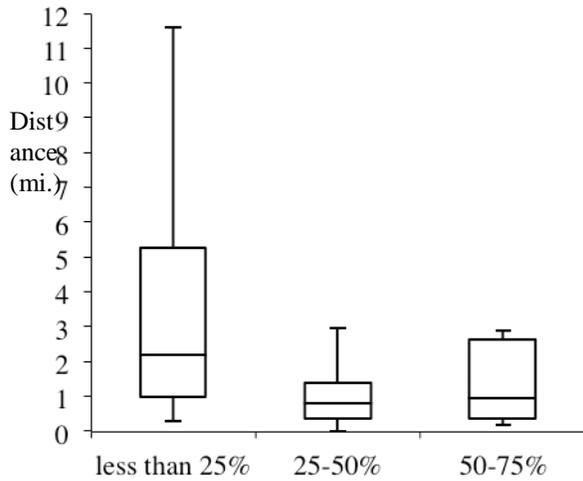


Figure 6. How distance effects percentage of food purchased at the market. Customers who live further from the market purchase less of their foods there. ($P=0.03615$, $P=0.001177$)

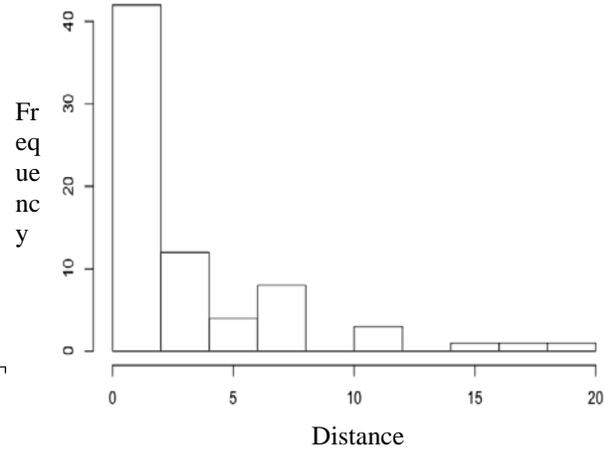


Figure 7. Distance of customers to the market. While most customers do not live within the identified 0.5 mile buffer, most live within 2 miles of the market.

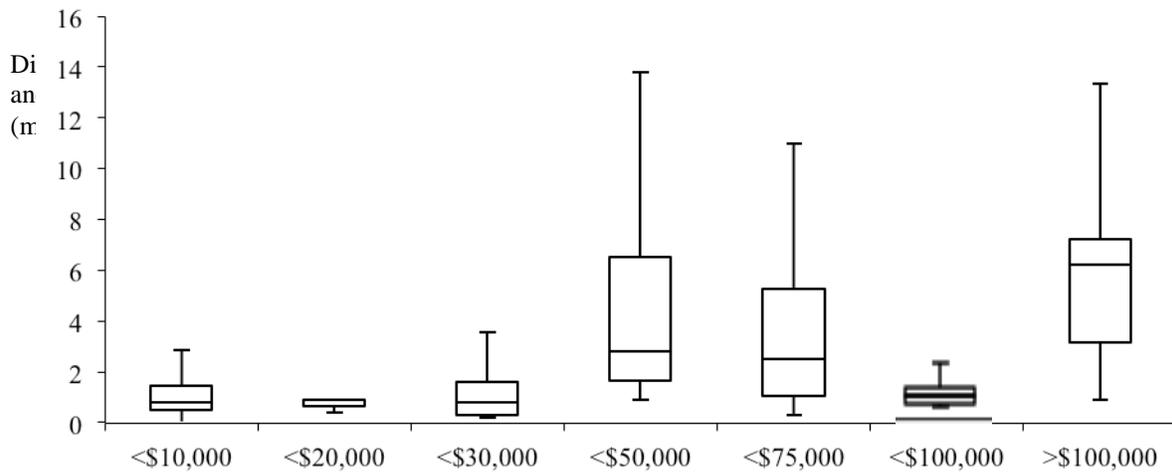


Figure 8. Distance to market between income levels. With the exception of customers making <\$100,000 higher income customers live farther away than lower income customers. $P=0.00055$

DISCUSSION

I found that the Richmond Certified Farmers' Market is successful in providing access to healthy foods to a local population who would have limited or no access to healthy foods.

Market customers comprised a range of ethnicities and income levels and shopping tendencies, yet many were low income, minority, and identified the market as an important means of increasing their access to food. This market improved access for many customers living in its service area who previously lacked a local source of healthy affordable foods, demonstrating that location is an important factor in accessibility.

Minority, low-income representation at the farmers' market

The racial and ethnic diversity of market visitors, with whites accounting for 18%, is encouraging, because minorities may be more subject to food insecurity in food deserts (Breneman 2011). The racial and ethnic composition of market customers is fairly reflective of the population of the neighborhood in which the market is located. However, it is interesting to note the disparity in the Hispanic populations, which I discuss in depth below. The diversity of customers at this market challenges claims that farmers' markets reflect a predominantly white culture that is inaccessible to minority populations (Alkon and McCullen 2010). Income levels were also widely represented, which speaks to the affordability of the farmers' market. While at many farmers' markets, price is a barrier to food accessibility, the presence of low income customers at this market would indicate that affordability is not an issue here. Guthman speculated that although many attempts at increasing food security to those minority and low-income demographics may have the best intentions, participation by these groups remains low because they are initiatives started from a white, wealthy perspective. However, this market does not seem to be experiencing a lack of minority, and low-income customers. Additionally, while high-risk populations are present at the farmers' market, they by no means dominate the customer base, and there is still a fair amount of higher income, white folks shopping at the market.

The demographics of the vendors at the market may affect the accessibility of this market to minority customers. Guthman (2008) asserts that many initiatives to improve food access fail because they emerge from a white, upper-middle class perspective. However, I noted that none of the farmers' market vendors were white. Instead, there were several vegetable and fruit stands manned by Hispanics, Southeast Asians, and an Indian man, and a nut and dairy stand as well as a sand which stand run by African Americans. These vendors were not selling specifically

ethnic foods, but it seemed that many of these vendors connected with their customers, and had positive relationships with them, often conversing in their native languages. Perhaps the racial representation of the vendors made the market a more accessible and inviting environment for minority customers.

The importance of low prices

The representation of low-income customers at the market can most likely be explained by the low prices that I documented in my observations of the vendors. In fact, 64.5% of the respondents felt that the food at the farmers' market was cheaper than at their other sources of food. It is important to question what allows the food at the farmers' market to stay affordable. From informal interviews of the farmers' market vendors, I found that the majority of the vendors do not sell organically certified foods. When asked why, vendors referenced the difficulties, and the cost of taking the steps necessary to qualify for organic certification, but they emphasized the fact that they maintain pesticide free practices. A few vendors cited their dedication to their customers, they want their customers to have a high quality product, but at the same time they want to keep their prices competitive and affordable. Vendors still maintain a certain level of sustainable practices that is appealing across all demographics of customers; however, it is the sacrifice of the organic certification that keeps the prices of the food low, and the food accessible to a low-income customer base. Price is definitely not a barrier to the access of this farmers' market, in fact, it would seem that this market supports the assertion that opening a farmers' market can actually reduce the price of food in a neighborhood (Larsen & Gilliland 2009).

Additionally, many of the vendors at this market accepted Electronic Benefits Transfer (EBT), the means of distributing Supplemental Nutrition Assistance Programs benefits, previously known as food stamps. Accepting EBT eliminates a cost barrier for many low-income people, and is a crucial means of improving food accessibility (Kantor 2011).

Percentage of food as an indicator of accessibility

The amount of food purchased by diverse customers at the market indicates the relative importance of the market as a means of addressing food insecurity for those living in the service area food desert. A visit to the farmers' market does not mean that visitors are overcoming food insecurity by shopping at the market, but purchasing food there does. Reviewing the summary statistics of the percentage of food purchased at the markets, it is clear that the market does not completely fill the food needs of its customers, as very few people purchase the majority of their food at the market. Yet almost all customers indicated shopping only for produce, which limits the percentage of their food that they can buy there. While the market does sell other products such as grains, nuts, and some dairy, the produce is most in abundant, and most in demand.

Purchasing habits across race and income level

I found no statistical difference in the amount of food purchased at the farmers' market between different races and income levels, suggesting that the market is equally accessible across these demographics, and again supporting that the "white cultural barrier" to accessibility (Alkon & McCullen 2010) is not taking effect in this study system. As discussed above, this can most likely be explained by the affordability of food due to EBT acceptance, and lack of organic certification, as well as the diversity of the vendors who sell at the market.

Purchasing habits of customers with limited food access

A better indicator of whether the market is successful in meeting food security needs is to inquire about customers' perceptions of their food environment (Freedman and Bell 2009). I found that customers who felt that they did not have access to healthy foods without the farmers' market purchased more of their foods at the farmers' market than those with access to other sources of healthy foods. This indicates that the market is providing food to a population that would otherwise be considered food desert residents. In other words, it is improving food accessibility to its customers, but at the same time not excluding other demographics of customers who may not be as prone to food insecurity. This market is not simply attracting

customers who bring their business from other good food sources (Alkon 2008), but is filling a gap in accessibility.

Do markets serve the neighborhood in which they are located?

Although the distance I used to identify accessibility does not seem to encompass the places of residence of most of my customers, this market does appear to serve the residents of the neighborhood in which it is situated. The lack of overlap between the respondents' place of residence and the area of accessibility that I had determined in my study calls into question the use of distance as a measure of accessibility, and what an appropriate distance is when taking that into account. According to my findings, the half-mile buffer is not far enough, particularly in this study site, to encompass the residential location of majority of the customers. People do not always shop at food outlets near their residence, due to car ownership and other transportation factors (Hillier et al. 2011). Yet most farmers' market customers did live within 2 miles of the market. Additionally, the fact that customers who lived closer to the market were more likely to purchase a higher percentage of their food at the market, indicated that this market is, in fact, serving local residents to a greater extent. This supports the idea that proximity to a farmers' market does correlate to increased purchase of market goods, suggesting that a market placed strategically, will have an affect on the local food environment (Park et. Al 2011).

The effect of transportation and work on range of accessibility

Transportation to the market, as well as the market's proximity to many customers' place of work may have expanded the range of accessibility for this market. An overwhelming majority indicated that they drive to the market, even those who live relatively close to it. Use of one's personal vehicle may be very common in this area, this vehicle ownership and use has a large impact on the range of sources that are accessible to a household (Burns & Inglis 2007). Additionally, many of the customers indicated that they were coming from work, on their lunch break, to purchase their food. Proximity to the work place, rather than the home, is therefore also an indicator of accessibility at this market. This supports the questions raised in some other studies about whether distance is really enough to determine the level accessibility to a source,

suggesting that other factors, often specific to the study site, may play into what is or is not accessible (Bader et al 2010). For this particular market, it seems that a distance of two miles might be good indicator of accessibility, however for other sources it may not be the case. What this study does show, that can be applied to other study sites, are the methods to assess who is actually accessing the source in question.

Who travels farther to come to the market?

Higher income customers at this farmers' market lived further from the market. This might be because customers with higher incomes have the luxury of time and money that allow them to shop where they want to shop, rather than to shop at the most convenient, or the cheapest source. For high and middle-income consumers may sacrifice money and convenience to support their ethical values or personal tastes when it comes to food (Hall 2001). Indeed, upon looking at the reasons for shopping at the farmers' market, 74.2% of the customers who lived over two miles away from the market purchased their food there because they perceived the food to be fresher and pesticide free, or because they felt that they were supporting local agriculture and local farmers. These customers are foregoing the convenience of a closer supermarket to make purchases that are more akin to their personal preferences of quality or support of local agriculture.

I expected that customers from farther away would have more social, environmental justice related reasons for visiting the market instead of financial reasons. Because these customers were coming further out of their way to the market, and were typically higher income, I expected them to hold more of elite ideals that Alkon (2008) references in her research on farmers' markets, as opposed to the local "food desert" residents who are likely to be more interested in just finding affordable food. While I found that there were many indications that these customers shopped at the market to support local farmers and to get pesticide free produce, there were a comparable number of local residents who indicated the same. I looked at this again across race and income levels, and found the same similarities in responses, which counters studies that argue that the reason food deserts are often composed of low income minorities is that these people have no interest in healthy foods (Larsen et. al 2009). However, it seems that the customers at this farmers' market have common goals in this regard, providing valuable

business to the farmers' market that allows the market to stay open for those customers who need it.

What does a successful market look like?

Why was this market successful at improving food accessibility to a local population? My findings supported the idea that there is more to accessibility than simply locating a source in a neighborhood of need (Bader 2010, Odoms-Young et. Al 2009). I identified three important factors that may affect the effectiveness of a market at serving a food insecure population.

1) Proximity to commercial areas

Proximity to commercial areas, in addition to residential areas, increased market accessibility. Customers who work in the area may live outside the range of accessibility of the farmers' market, but their work place brings them within closer proximity of an abundant food source. Locating a market near a commercial area requires opening the market during a weekday during lunch hours so that customers can come by on their lunch breaks. Locating a market in an area close to commercial businesses can attract customers who live near by, and work near by.

2) A balance of low income, and higher income customers

Prior to studying this farmers' market, I had envisioned a successful market as one that catered primarily to low income, minority, food desert residents. However, this market points to the need for a balance of customers to assure the continued existence of farmers' markets in food deserts. While many customers rely on the market for access to healthy foods, there are other customers who bring their business from elsewhere. These customers provide a larger customer base for the market, ensuring a sufficient volume of customers to entice vendors, and keep the market in business. Additionally, a higher volume of customers often corresponds with lower prices at the market.

3) Providing cheap food

The presence of a market in a food insecure neighborhood is insignificant if the product sold is unaffordable to its residents. Ensuring the acceptance of EBT by vendors is one means of avoiding a monetary block for low income customers at the farmers' market. Additionally, the cost of food at the market is more important than the organic certified label. While sustainable practices are appreciated by customers, across income level and race, some of these practices can be maintained without the costs of obtaining organic certification. Markets that hope to improve food accessibility to food insecure customers should focus on maintaining low prices, even if this comes at the cost of an "organic" product.

Limitations and future steps

Because I only surveyed customers at one market in Richmond, CA there are limitations to how much I can generalize my results to other urban areas and other farmers' markets. Limiting the number of surveys has implications for how much I can infer about the study site as well. Because I only obtained 96 usable surveys, the results that I obtained from this data may not be entirely representative of all the customers that shop at the market. Additionally, I did not follow up with interviews with the customers, which would have permitted me to get a clearer view of the values of the customers and the importance of the market to them.

Another limitation is that my study does not take into account the proximity of the market to people's workplace. I examined distance from home, but in talking to many of the surveyed customers I found that many people were actually coming to the market from work. This made sense, as it was a Friday market that was not located in a solely residential area. This raises some questions about the definition of accessibility. Perhaps proximity to a work environment is important thing to consider when examining issues of accessibility, and planning where to locate future markets with a high range of accessibility. It would also be useful to examine whether there was a difference between the demographic of people who are coming from work, and the people who are traveling from home to the market. Distance to place of residence might not be the only determinant of accessibility; there may be implications for proximity to commercial areas, accessibility and affordability of public transit, etc. Broadening the scope of this study to look at other markets and different factors of accessibility would create insights into the best

location for farmers' markets, and how to identify food deserts not simply from a distance perspective.

Many customers who opted not to take my survey could not speak or read English, which may account for the discrepancy between race representation of Hispanics in my survey sample and the percentage of Hispanics in Richmond. Any future study should use a Spanish language survey to sample this demographic more effectively.

Broader Implications

My findings suggest that this farmers' market in Richmond, CA reached a local demographic of low income, minority customers who would otherwise have limited access to healthy foods. This market is improving food accessibility to a target local demographic. This study implies that markets may be a successful tool in remediating the phenomena of a food desert, provided that food remains affordable to the customers. If implemented in other areas where there is limited access to food sources, farmers' markets may be expected to improve the health and well being of the neighborhoods in which they are situated.

Additionally, my study identified a few factors that were crucial to the effectiveness of this market in improving food accessibility to a food insecure population that may be applied to future markets as well. Markets that hope to achieve a similar level of effectiveness should take into account their proximity to commercial areas, as well as residential areas, ensure that they are providing a product that is cheap, and affordable to all customers, and accept EBT. Additionally, they should attempt to appeal to a wide variety of customers, not just those that are food insecure. My study found that it is possible for a financially and racially diverse customer base to share similar values when it comes to food, and to use the market symbiotically.

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