Farmers Markets versus Supermarkets: Measuring consumer beliefs surrounding local food

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Abstract: It is easy to be a locavore in California where finding ingredients grown within a 100-mile radius from home can mean access to an abundant variety of foods. This is not necessarily true in other regions of the United States where climate, land or water availability and practicality may mean limitations to variability and access. Among many other challenges, the agriculture industry is tasked with significantly increasing outputs while decreasing inputs such as water, land, and chemical use while simultaneously reducing the carbon footprint associated with food production. The popularity of a locavore approach is, at least in part, based on the assumption that it is inherently better for the environment. This study used a Q-sort methodology to measure consumer preferences for local products and found that although there is a consistent general support for the local economy, other motivating factors vary in the San Luis Obispo community.

Introduction

It is easy to be a locavore in California where finding ingredients grown within a 100-mile radius from home can mean access to an abundant variety of foods. This is not necessarily true in other regions of the United States where climate, land or water availability and practicality may mean limitations to variability and access. While the locavore movement and farmers markets play an important role in introducing consumers to growers and fomenting meaningful conversations about farming practices, this may not be the most practical approach to achieve sustainability. Among other challenges, the agriculture industry is tasked with significantly increasing outputs while decreasing inputs such as water, land, and chemical use while simultaneously reducing the carbon footprint associated with food production. The popularity of a locavore approach is, at least in part, based on the assumption that it is inherently better for the environment. Yet, locavores and researchers frequently make this assumption without a strong empirical foundation.

The general disconnect between foodies and farmers may be related to geography. In the past century, Americans migrated from farms to cities. In 1900 there were roughly 75 farms for every 1,000 Americans – today there are fewer than 7 per 1,000 Americans, and as a result there is a gap in the understanding of food production practices (Lusk 2017). The shift is leading to a demand for transparency inspiring new marketing techniques and food policies. One of the misnomers often believed by consumers is that the distance food travels from farm to purchase point has a significant impact on the environment. These concerns are addressed throughout the existing literature with varied attempts at defining *local food.* While consumers find many perceived benefits to shopping locally, what shopping locally actually means and what the

benefits are associated with these purchases in comparison to shopping globally are not clearly outlined.

I investigated the perception surrounding the sustainability of the path foods take from field to farmers markets and from fields to supermarkets. Using Q-methodology I tested consumer opinions regarding farmers markets and supermarkets in San Luis Obispo and in turn, their perceptions of what defines local. Q-methodology is a context sensitive approach to a quantitative understanding of beliefs and the results clarify consumer priorities and preferences by asking participants to sort statements on a scale of "Agree with most strongly" to "Disagree with most strongly" in order to establish patterns across individuals (Barry and Proops 1999). Understanding consumer motivations for making purchases could potentially lead to a more concrete definition of "local." Establishing an awareness of who buys local food and what motivates them to do so can be valuable information for producers and policymakers alike.

The evolution of the locavore movement

The local food movement is more popular than ever. Farm operations with direct-to-consumer sales of food for human consumption increased to 144,530 from 116,733 between 2002 to 2012 and the number of farmers markets operating in neighborhoods across the U.S. jumped to 8,687 markets in 2017 from just 1,755 markets in 1994 (Martinez 2010 and also see Fig. 1 in Appendix). Proponents of the "buy local" movement suggest that locally produced food is fresher, tastier, better for your health and better for the environment (Ackerman-Leist 2006, Nestle 2010, Nestle 2013). Nevertheless, research shows that proximity may not be the best indicator of costs or benefits associated with the product (Coley et al. 2011, King 2010, Desrochers and Shimizu 2012, Lusk 2013).

Scholars and practitioners do not agree on the definition of local food, which varies depending on the source (Darby et al. 2008, Martinez 2010, Zepeda and Li 2006). For example, a study done in Ohio determined that consumers define locally grown as produce grown within their state boundary, however it is hard to tell if this would hold true in a larger state like California or even if it would differ from west coast to east coast (Darby et al. 2008). In the 2008 Food, Conservation and Energy Act, the U.S .Congress asserted that the total distance a food can be transported in order to be considered local is less than 400 miles or within the same state (Martinez 2010). Zepeda and Li defined "local" as buying from farmers markets, buying directly from farmers and Community Supported Agriculture (CSA) memberships which means the distance traveled is overlooked completely and the assumption that the venue or market alone establishes that the product is local (Zepeda and Li 2006). Widely varying definitions of locality makes measuring the trend a daunting task that may not be consistent in every geographic region and may be based on a different set of criteria from place to place.

The Environmental Impact of Shopping Locally

One of the common viewpoints among consumers is that farmers markets have a lighter impact on the environment. This perspective is widely disputed (Coley et al. 2011, Weber and Matthews 2008, Avetisyan 2014, Desrochers and Shimizu 2012, Martinez 2010, Edwards-Jones et al. 2008). According to Desrochers and Shimizu:

"Locavorism can only result in higher costs and increased poverty, greater food insecurity, less food safety, and much more significant environmental damage. Only through greater technological advances, economies of scale and international trade can we achieve the locavores' worthy goal of improving nutrition while diminishing the environmental impact of agricultural production" (Desrochers and Shimizu 2012).

In part, much of this dispute may actually stem from the different understandings of local, again coming back to the debate about what constitutes locality to the average consumer.

It is likely that consumers would associate reducing greenhouse gas emissions as an important reason to shop local. The goal to reduce greenhouse gas emissions is critical as rising CO2 levels are causing concern. It is also an impetus for evaluating existing agricultural practices. That being said, life cycle assessments and analyses of energy use of food systems, do not offer much evidence that energy and greenhouse gas emissions reductions are tied to localization (Martinez 2010, Edwards-Jones et al. 2008). A robust analysis in the journal *Trends in Food Science and Technology* found, "It is currently impossible to state categorically whether or not local food systems emit fewer greenhouse gases than non-local food systems" (Edwards-Jones et al. 2008). This would appear to show a general lack of scientific evidence supporting the environmental argument for supporting locally grown products.

Transportation

While the concept behind local food is meant to reduce the distance traveled from farm to fork, the benefits of doing so might not be as impactful as one may intuitively believe. Transportation in the life-cycle supply chain of food production accounts for only 11 percent of greenhouse gas emissions (Weber and Matthews 2008 and Avetisyan et al. 2014). This implies that food production methods on the farm are much more relevant to conversation than distance traveled. Additionally, it was determined that the mode of transportation (rail vs. road, rail vs. boat) is just as important as the distance that is traveled (Coley et al. 2011). Fuel use is more complex than miles traveled and in King's article it was found that fuel use per unit product is often larger in local supply chains than would exist in delivery to supermarkets (2010). The idea that "food miles" can provide a measurement for sustainability is an oversimplification and

ignores the evidence that delivering to one larger facility is more efficient than delivering to multiple local vendors. Furthermore, without a comprehensive selection available at farmers markets it is likely that a consumer will make multiple trips to farmers markets, Whole Foods and Costco each week which could create an additional impact on the environment (Lusk 2013).

Production Methods

Locavores often cite organic preferences as a driving factor in choosing to shop locally (Nestle 2013). There are very distinct rules and regulations associated with certified organic labeling. This distinction requires agricultural conservation practices that integrate cultural, biological, and mechanical practices that eliminate the use of synthetic pesticide use. Although farmers market venues do not imply organic certification and it is a common belief that local food and organic production methods go hand in hand. While many local food farmers use organic practices, according to USDA only approximately 5 percent of farmers selling at these venues are certified organic (Martinez 2010). This ties back to a need for a strong definition of what local means to the consumer. If the consumer preference is for organic, the conversation needs to reflect that there are strong differences between the two and should not be used interchangeably. It would suggest that a local certification process may be useful to informing consumer choices. Additionally, it is possible that an organic or local preference may not stem from preferred production practices but rather a perceived health benefit.

Benefits of Shopping Locally

Economic Benefits

Environmental consideration is not the only factor in perceived consumer preferences for shopping local. In a willingness-to-pay (WTP) experiment, Toler et al. (2009) found that consumers preferred to support local farmers over nonlocal farmers and were willing to pay a

premium price for a locally grown product. This study looked at shoppers at grocery stores and farmers market venues and found that in both venues the preference was not related to freshness, safety or food miles, instead reflecting support for local farmers (Toler et al. 2009). Furthermore, there is empirical evidence that greater local retention of the food dollar can help stimulate the community's economy and can even have a job multiplier effect ranging from 1.41 to 1.78, meaning that for each full-time job created at a farmers market, there is also a support between 0.41-0.78 a full-time job in other sectors of the surrounding economy (Martinez 2010).

A profile of shoppers in San Luis Obispo found: "consumers perceive farmers market produce is fresher looking, fresher tasting, a higher-quality product, a better value for the money, more reasonably priced…when compared to supermarket produce" (Wolf et al. 2005). Although it is difficult to measure across different products it was found that consumers believe farmers markets items are offered at lower or more reasonably prices than grocery store prices (Wolf et al. 2005). These concepts surrounding perceived economic benefits such as an increase in jobs, lower food prices and overall value for food, suggests the "buy local" argument may be more concentrated on financial benefits rather than elements promoting sustainability.

Barriers to Shopping Locally

Economic principles should be considered when deciding whether buying local makes sense. Comparative advantage exists when a region is the most efficient at producing a specific product. When one region produces a product where comparative advantage does not exist, loss is inevitable (Winfree and Watson 2017, Lusk and Norwood 2011). Additionally, grants and initiatives such as Farmers Market and Local Food Promotion Program and Specialty Crop Block Grants, total more than $100 million per year to support buy local efforts (Martinez 2010). Funding directed towards "buy local" means funding is being redirected from other areas of need

and opportunity loss could occur as efforts become counterproductive to their original intent to improve situations (Winfree and Watson 2017). Scale alone is not able to produce sustainability but rather the agenda put forth by policy makers (Born and Purcell 2006). It comes down to the fact that there are tradeoffs associated with buying local that need to be considered when adopting the mindset that "buy local" is superior to shopping globally.

Additionally, a profile done in San Luis Obispo found that the inconvenience factor was the number one barrier to shopping at farmers markets (Wolf et al. 2005). This does not necessarily prevent shoppers from buying local products from other vendors. Research suggests that a wide range of venues can benefit from offering sustainable food choices (Onozaka et al. 2010). Potentially purchases made at grocery stores and specialty stores could carry products that would meet the needs of consumer demand.

Methodology

I developed a Q-sort to examine the existing perspectives consumers have surrounding the purchase of local food. The intent was to determine motivations associated with the local trend and develop criteria to inform producers and policymakers on the thought process behind purchase patterns. To extract this information and establish groups of thought, the Q-sort asked participants to rank 28 statements about preferences surrounding locally grown food related to price point, convenience, organic, environmental impact, economic factors, health, variety and fresh options (see Table 1). Respondents sorted statements from -5 for strongly disagree to +5 for strongly agree, following a quasi-normal distribution. This allowed participants to deliberate amongst the options and encouraged them to clarify their opinions about the statements which evoked the strongest reactions. They were informed that if their opinions did not follow the

quasi-normal distribution that they were not required to follow those guidelines but rather distribute the statements to most accurately represent their beliefs.

I created the Q-sort statements by incorporating motivations for shopping at a farmers market or a grocery store. For each element (Table 1) I created statements that relate to a viewpoint from the literature or popular discourse. The goal of this Q-sort was to allow respondents to identify what motivates them when shopping for their groceries by letting them sort out which statements they associated most strongly with their belief structure and which statements they disagreed with most strongly. Q-sorts differ from surveys in that they create opportunities for participants to reexamine statements as they value new statements. As a result, statement rankings change as participants read new statements, breaking the independence assumption typically underpinning most survey approaches.

The sample for this study is comprised of 48 adults in the San Luis Obispo city limits. I sought out participants from four different locations: Whole Foods, San Luis Obispo Co-op, Vons, and the Saturday morning San Luis Obispo Farmers Market. I selected these four sites because they each attract a unique set of shoppers with a diverse range of perspectives. Whole Foods is a supermarket chain specializing in natural and organic products. The SLO Co-op venue offers a wide variety of local, organic, and non-GMO items. Vons is a national supermarket chain that is stocked with a wide variety of options. The Saturday morning SLO Farmers Market is located in the Embassy Suites parking lot and has a wide variety of vendors selling everything from cut flowers to hummus to hydroponically grown tomatoes.

I visited each of the four sites and solicited shoppers to spare 10 to 15 minutes to participate in the Q-sort. Each participant was asked to complete the Q-sort in person. I spent four hours at each of the venues which allowed a solid window of time for capturing the targeted

population's participation. I performed the data collection on weekend days which seemed to be busier times for the venues. Thirty-five percent of the sample was from Whole Foods (17 people), 27 percent was from Vons (13 people), 20.83 percent was from SLO Co-Op (10 people), and 16.67 percent was from the farmers market (8 people).

Table 1 Q-Sort Statements: 28 Statements Participants Sorted for the Study

Motivator	Farmers Market	Supermarket
Environmentally conscious	1. Shopping at farmers markets is environmentally friendly. 2. Shopping at a farmers market is not more sustainable than shopping at a chain grocery store.	3. Farmers markets can create a lot of food waste. 5. One stop at the grocery store creates more greenhouse gas emissions than a whole farmers market.
Price point	4. I believe that farmers markets have more affordable prices than grocery stores. 8. I like to support local farmers even if farmers market prices are higher.	6. My main priority is getting the best deal on my groceries.
Convenience	7. Farmers markets are convenient for weekly shopping needs.	9. It is a better use of time to shop at a single grocery store because I can make one trip to get what I need for the week.
Fresh	10. I shop at farmers markets because they offer the freshest produce.	12. Supermarkets generally sell fresh produce.
Locavore mindset **-economy** **-environment** **-get to know your farmer**	13. I shop at farmers markets because it is important to me to meet the people who grow my food. 11. It is important to me to support the local economy. 14. Farmers markets are more about community than buying my groceries for the week.	15. Buying locally grown products at the supermarket still helps local farmers. 17. Most supermarkets carry enough local produce to satisfy my needs. 27. Local food is not always better for the environment.

Variety/Quality **-organic** **-seasonality**	20. I shop at farmers markets because they offer better quality produce. 19. I shop at farmers markets because they offer the best selection of in-season produce. 20. I shop at farmers markets because I do not want my food to be grown with pesticides. 21. Whenever presented with a choice of organic versus local I will choose local food.	18. I can typically find the variety of organic food that I desire at a grocery store. 23. There is no difference in quality in the food from grocery stores versus food from a farmers market. 22. I appreciate the ability to get asparagus anytime at my grocery store.
Health	26. Local food from a farmers market is the healthiest option. 25. Locally grown food is healthier than organic.	28. It doesn't matter where I buy produce. As long as I am consuming fruits and vegetables, I am taking care of my health. 24. Canned and frozen foods are healthy and convenient options.

Results

Three unique groups were determined using a cluster analysis based on Pearson Correlation Coefficient and the Furthest Neighbor algorithm. I averaged statement values within each of the three clusters and to understand the various perspectives. I looked at the statements that had a mean of 2.5 and above and -2.5 and below to interpret attitudes about strong beliefs and disagreements amongst the statements (see Table 2). Overall, responses proved to be widely varying across the respondents confirming that there is not one set of elements that influences shoppers. Twenty-three out of 28 statements had a range of 9 or greater which shows that there was little agreement amongst the participants. Only one statement had a range of 5 or fewer. Consistent with the literature, all clusters strongly supported statement 11, "It is important to me to support the local economy." Outside of this statement there was very little consensus about what constitutes "locally grown."

Farmers Market Frequent Flyer Cluster

This cluster was the largest cluster of the three with 27 respondents from all four venues. They believed that shopping at a farmers market is environmentally friendly [1] and that these types of venues offer better quality and fresher produce than available at supermarkets [10, 16, 28, 23]. This cluster agreed with the viewpoint that supporting the local economy is important as did the other groups [11]. Additionally, this group found that they are willing to spend more money in order to purchase the type of groceries they desire [6].

Locally Motivated Cluster

This category was the smallest sample with nine respondents. None of the participants surveyed at the San Luis Obispo Saturday Morning Farmers Market fell in this cluster. This cluster, similar to the frequent flyers, claimed that price was not a concern [8] and that it is important to support the local economy through buying local products whether they are at a farmers market or grocery store [11, 15]. Their main motivation appears to be the local factor as they do not mind shopping at a supermarket as long as there is a local section [15, 23].

Bargain Hunting Locavore Cluster

This cluster captured 12 individuals and all four venues were represented in this response. This group differs from the other two in that they agreed that their main priority is to get the best deal on their groceries which establishes this cluster as the bargain hunters [6]. Although they are price conscious, this group also differs in that they are more concerned about farming practices than distance the food is grown [20, 25]. The group does agree with supporting local farmers and the local economy but overall, their shopping preferences are not motivated by the "buy local" trend [11, 15]. One demographic anomaly is that this group falls in the young adult category with

the average respondent checking the 25-35 year-old box. The other clusters trend older with the frequent flyers falling in the 45-54-year-old category and the locally motivated falling in the 55-64-year-old category.

Table 2 Cluster Profiles

	Cluster #1 – farmers market frequent flyers	Cluster#2 – locally motivated	Cluster #3 – bargain hunting locavores
Environmentally Conscious	Consider farmers markets to be environmentally friendly.		
Price Point	**Spend more to support local farmers.**	**Spend more to support local farmers.**	*Budget conscious*
Locavore Mindset	**Important to support local economy.**	**Important to support local economy. Buying locally grown at grocery stores is still helping contribute to local farmers.**	**Important to support local economy. Buying locally grown at grocery stores is still helping contribute to local farmers.**
Variety/Quality	Believe the produce at farmers markets is better quality.	Venue doesn't matter in terms of quality as long as labeling indicates produce is locally grown.	Recognize that food sold at farmers markets is not necessarily organic.
Health		Canned foods are not healthy or convenient options.	Prefer organic over local.

Note: bold phrases indicate agreement across two or more clusters. Italicized phrases indicate disagreement across clusters.

Table 3 Individual and Cluster Scores

Statements		Statistics for Individuals		Means for Each Cluster		
		Range is 5 or Less	Range is 9 or 10	Mean is +2.5 or Greater		Mean is -2.5 or Less
		Mean	Range	Cluster #1	Cluster #2	Cluster #3
	1. Shopping at farmers markets is	2.64	6	3.11	1.78	2.25

	environmentally friendly.					
	2. Shopping at a farmers market is not more sustainable than shopping at a chain grocery store.	-1.67	10	-2.26	-1.00	-0.83
	3. Farmers markets can create a lot of food waste.	-1.85	8	-2.48	-1.44	-0.75
	4. I believe that farmers markets have more affordable prices than grocery stores.	-0.42	10	-0.33	0.89	-1.58
	5. One stop at the grocery store creates more greenhouse gas emissions than a whole farmers market.	-0.94	10	-1.04	-0.67	-0.92
	6. My main priority is getting the best deal on my groceries.	-1.42	10	-3.00	-1.89	2.50
	7. Farmers markets are convenient for weekly shopping needs.	-0.98	10	2.15	0.33	-1.17
	8. I like to support local farmers even if farmers market prices are higher.	2.5	9	**3.30**	**3.00**	0.33
	9. It is a better use of time to shop at a single grocery store because I can make one trip to get what I need for the week.	-0.21	9	-1.70	1.33	2.00
	10. I shop at farmers markets because they	2.54	8	3.37	1.78	1.25

	offer the freshest produce.					
	11. It is important to me to support the local economy.	3.73	5	**3.96**	**3.44**	**3.42**
	12. Supermarkets generally sell fresh produce.	0.04	10	-0.67	0.22	1.50
	13. I shop at farmers markets because it is important to me to meet the people who grow my food.	1.21	10	2.78	-0.44	-1.08
	14. Farmers markets are more about community than buying my groceries for the week.	1.04	10	1.11	1.22	0.75
	15. Buying locally grown products at the supermarket still helps local farmers.	2.35	6	2.25	2.56	2.42
	16. I shop at farmers markets because they offer better quality produce.	1.96	9	3.00	1.00	0.33
	17. Most supermarkets carry enough local produce to satisfy my needs.	-0.25	10	-1.74	1.78	1.58
	18. I can typically find the variety of organic food that I desire at a grocery store.	0.71	10	0.78	-1.11	1.92
	19. I shop at farmers markets because they offer the best selection of in-season produce.	2.08	9	2.96	0.55	1.25

	20. I shop at farmers markets because I do not want my food to be grown with pesticides.	1.52	10	2.89	1.89	-1.83
	21. Whenever presented with a choice of organic versus local I will choose local food.	0.35	10	0.185	-0.33	1.25
	22. I appreciate the ability to get asparagus anytime at my grocery store.	-0.48	10	-1.52	0.00	1.50
	23. There is no difference in quality in the food from grocery stores versus food from a farmers market.	-2.96	10	**-3.96**	**-2.67**	-0.92
	24. Canned and frozen foods are healthy and convenient options.	-1.29	10	-1.48	-2.78	0.25
	25. Locally grown food is healthier than organic.	-0.88	10	-0.70	-0.56	-1.50
	26. Local food from a farmers market is the healthiest option.	1.46	10	2.26	1.44	-0.33
	27. Local food is not always better for the environment.	-0.71	10	-0.78	-2.00	0.42
	28. It doesn't matter where I buy produce. As long as I am consuming fruits and vegetables, I am taking care of my health.	-1.60	10	-3.00	-0.67	0.92

Discussion

I designed this study to capture a range of belief structures and study the similarities and differences in beliefs surrounding purchase preferences for local food. The Q-sort distinguished subtle differences throughout the sample even with a group that had strong similarities in that they overall identified support for buying local. It was interesting to find that consumers in the sample did not gravitate towards a consensus across the three clusters to create a true definition of "local grown." Different consumers valued different factors and other than the desire to support the state of the local economy, belief structures varied between clusters and individuals. These findings are not unfounded as the results echo the existing literature in the sense that a solid characterization does not exist. It might make sense to consider that with such a wide range of means across statements consumers may have unique reasons for purchasing local. It might also make sense that consumers are identifying "local" as a positive factor just based on the general popularity for the sentiment rather than basing it on science or true belief structures.

Limitations and recommendations for future research

Through conducting this research, a few ideas for future research surfaced. Although I aimed to engage the broadest sample possible, time-related restrictions did have an impact on the participants. One specific limitation was that I found it was easier to persuade male respondents to spare the time than it was for females. Out of 48 participants, 29 were male, 17 were female, and two preferred not to answer. This disparity could be attributed to the fact that several women were running errands with children and could not spend the amount of time needed to participate in the study. Future studies might consider alternatives that might be more conducive to capturing a wider female audience as well as casting a wider net to capture more parent participation in order to be inclusive of that perspective.

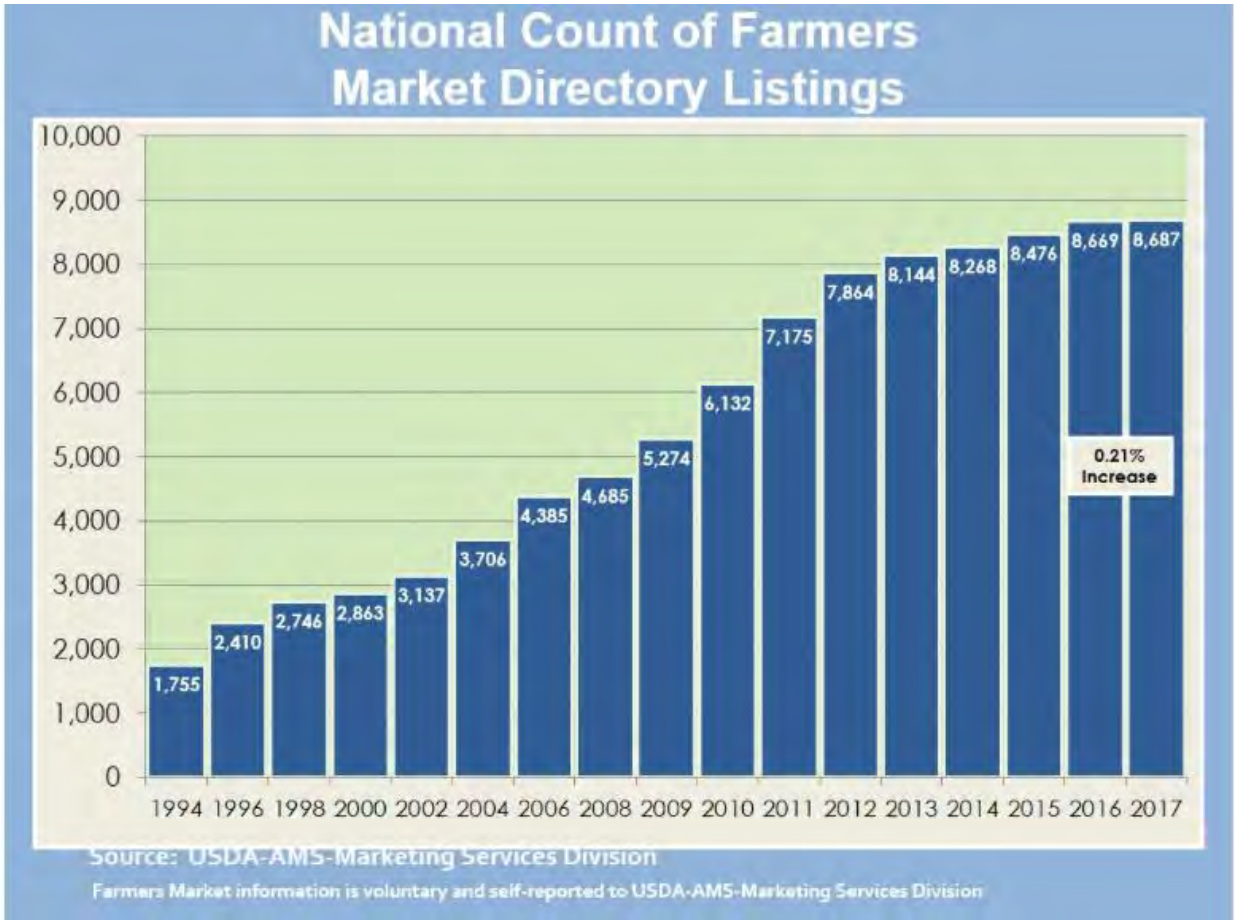
Another limitation was that the geographic location of the study. The research was performed in a community with easy accessibility to fresh fruits and vegetables. Conducting this study in Minnesota during the winter would have likely rendered different results. Even examining urban areas without agricultural abundance in California may have brought to light a different set of priorities. It would be beneficial to determine whether these patterns are community based, statewide or national in scope.

Conclusion

The purpose of this study was to determine whether consumers interpret the local food movement differently or if all patterns were constant throughout the sample. Based on the results from this Q-sort it is clear that although there is a consistent general support for the local economy, the idea of what motivates consumer purchases varies in the San Luis Obispo community. Drawing from the statement that found consensus in this study, I would recommend vendors in the city of San Luis Obispo embrace locally sourced food and use existing venues, whether they are farmers markets or supermarkets, to promote these consumer preferences. Furthermore, I would suggest that the findings of this study be used in determining the definition of local. If consumer preferences for local food are defined as supporting local growers, it should be taken into consideration for classification purposes that local is not a trend that needs to be defined by miles but perhaps could be measured by community or county or even by state. Based on the results of this study, it would imply that consumers are more concerned with economic benefits than environmental benefits of the shop local trend.

Appendix

Figure 1 Significant Increase in the Number of Farmers Market Venues



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