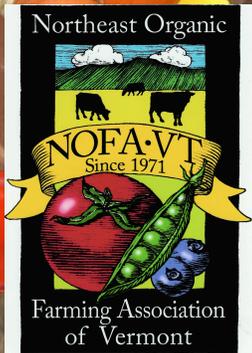




Vermont Farmers' Markets and Grocery Stores: A Price Comparison



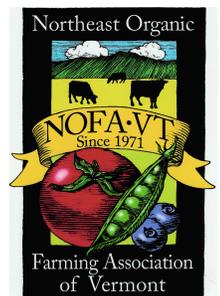
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Introduction

The number of farmers' markets in the United States has precipitously grown in the last two decades, from an estimated 1,755 farmers' markets 15 years ago to a current figure of 5,274. Vermont alone has experienced a 177% increase in farmers' markets in the last 15 years, growing from 27 farmers' markets in 1995 to the current figure of 75. The increase in farmers' markets over this period corresponds to a growing concern over food production practices and a related increase in demand for locally grown food. Yet, according to USDA estimates, American consumers still only spend approximately 0.2% of their food dollars at farmers' markets. More troubling, recipients of Supplemental Nutrition Assistance Program (SNAP) benefits spent only 0.008% of their total benefits nationwide at farmers' markets in 2009 (Briggs et al., 2010).

These figures indicate that, while farmers' markets have increasingly become a viable direct sales option for farmers, there is still a tremendous amount of potential growth, and invariably market stability, if market managers, participating farmers, and supporting institutions can increase consumer participation at farmers' markets. A recent report on farmers' markets and SNAP benefit usage, for example, revealed that if SNAP redemptions at farmers' markets grew to account for only 1% of all SNAP transactions annually, the monetary value would equate to an additional \$494,668,112 going directly to local farmers participating at farmers' markets (Briggs et al., 2010). There is a tremendous incentive, therefore, for farmers' markets and supporting agencies to not only reach out to more middle-income consumers, but to lower income individuals as well. The incentive does not, of course, move in one direction. Increased access to fresh local foods has associated health benefits for consumers, while additionally stimulating local interactions between various socioeconomic groups, which benefits the health of the community as a whole.

Increased access may result from the efforts of the market itself, especially as younger markets develop and establish a reputation amongst members of the community. However, there are many factors that markets aren't inherently responsible for, such as consumer perceptions, which may be adversely affecting participation at farmers' markets. The perception of higher prices at farmers' markets is an example of a perception that acts as a barrier to greater patronage at farmers' markets. An Oregon study, for instance, examined the purchasing habits and attitudes of two different Oregon communities and found that 31% of respondents perceived high prices as greatly restricting their purchase of local foods, while 39% of respondents perceived high prices as somewhat restricting their purchase of local foods (Stephenson and Lev, 2004). The Oregon Food Bank, in a separate study, examined perceptions of SNAP recipients and discovered similar perceptions, if not stronger, of high prices at farmers' markets acting as a barrier to greater market participation (Grace et al., 2005).

Additional studies have lent further credence to the Oregon Food Bank's findings, strongly suggesting that the perception of high prices at farmers' markets is prevalent, especially amongst lower income groups, and in the process affecting patronage at farmers' markets (Briggs et al., 2010; Fischer 1999). Furthermore, respondents in the Food Bank study commented that they perceived markets as selling primarily organic produce, and they perceived organic produce as being more expensive. Perceptions such as this are especially relevant for the state of Vermont, which has the greatest number of certified organic farms and certified organic acreage per capita in the United States. According to a 2008 USDA production survey, in absolute terms Vermont ranked 10th in total certified farms and 8th in total organic sales nationally (USDA, 2008). Perceptions of organic prices, consequently, may be compounding the perception of higher prices at farmers' markets to a greater extent in Vermont than in other regions. The point should also be raised that a common anecdotal talking point exists amongst

detractors of local foods that local foods at farmers' markets are exponentially more expensive than their conventional counterparts at more traditional grocery stores.

Perceptions, as we all are well aware, may or may not correspond to what is actually the case. However, until there is either empirical confirmation or invalidation perceptions will, along with the behaviors they induce, persist unabated. Until consumers of all socioeconomic statuses have an idea for what price differences exist, if differences of price do in fact exist, they cannot be expected to alter their purchasing habits. Likewise, participating farmers and market managers cannot develop effective market strategies and benefit from a larger consumer base if there is no baseline comparison data to inform their decisions. The perception that prices are higher at farmers' markets than they are at grocery stores is, therefore, the primary impetus for this price comparison study.

There have been few formal studies comparing and contrasting prices at farmers' markets with prices at conventional grocery stores. A business statistics class at Seattle University has over the years compared farmers' market prices with grocery store prices, though they only collected prices for one week at two different markets, possibly overlooking seasonal and between market variations in price. In 2009, the Leopold Center for Sustainable Agriculture released the most significant study comparing local farmers' market prices with conventional non-local grocery store prices. The Leopold study looked at prices at farmers' markets and grocery stores in four cities in Iowa, over a period of three months (Pirog and McCann, 2009). The Leopold study demonstrated that local prices at farmers' markets were often equal to or lower than grocery store prices. Due to a lack of organic availability at both farmers' markets and grocery stores, however, the Leopold study was limited to comparing the prices of only conventionally grown foods. This study, on the other hand, not only compares the prices of conventionally grown foods, but the prices of organically grown foods as well. Regardless, the Leopold study remains to be the most comprehensive pricing study to date, and an important step in assuaging consumer perceptions about high prices at farmers' markets.

Consequently, one of our goals is to complement the Leopold study while simultaneously introducing original and regionally pertinent pricing data. The dynamics of local food systems are inherently varied. Thus, farmers' market pricing data from Iowa is not necessarily applicable to farmers' markets in Vermont—as evidenced by a lack of organic price data—though data from both regions can establish a more realistic perspective of prices at farmers' markets nationally.

With that being said, the primary objectives of this price comparison study are threefold:

1. Establish an overview of prices at farmers' markets that consumers can expect to encounter in Vermont, and how they compare with grocery store prices.
2. Utilize the pricing data to formulate more effective outreach efforts for EBT beneficiaries who may be reluctant to visit farmers' markets due to the perception that prices at farmers' markets are higher. For example, identifying periods of the growing season when farmers' markets prices are particularly low or identifying specific produce prices that are particularly low can better inform purchasing decisions by EBT users.
3. Provide farmers' market producers and market managers with robust pricing data that can inform their pricing decisions and improve the marketing efforts of farmers' markets as a whole.

Methodology

Our team consisted of five members, with each member collecting prices from two farmers' markets and two corresponding conventional grocery stores, for an initial total of ten farmers' markets and ten grocery stores. However, due to one farmers' market being too small—insofar that it did not have a substantial number of food vendors—prices were only recorded from 9 farmers' markets. Members selected farmers' markets that were relatively close to their place of residence, and when possible, selected one large market and one small market. They then selected a grocery store and/or co-op for each farmers' market that was either in the same town, city, or general locality of the farmers' market. Each member collected their corresponding grocery store prices, including sale prices, on the same day that the farmers' market prices were collected to ensure that observed prices were an accurate portrayal of prices that a consumer would encounter for that particular day.

Primarily, prices were collected between July and August with a few collection periods occurring in September. The goal was to collect prices three times in each month, with two of the collection periods occurring during the first and last weeks of the month. The first week of the month was emphasized because SNAP recipients receive their benefits at the beginning of each month. Consequently, price comparison data at the beginning of the month is especially informative for SNAP recipients who are likely to use their benefits during this period of time. Due to scheduling conflicts for some members however, the collection periods did not always transpire in this fashion, and this is why, in order to compensate for missed dates, a few collection periods occurred in September.

Price collection occurred at the following farmers' markets, grocery stores, and co-ops:

- Burlington Farmers' Market : Price Chopper-South Burlington
- Burlington Old North End Farmers' Market : City Market-Burlington
- Five Corners Farmers' Market-Essex Junction : Mac's Market-Essex Junction
- Hardwick Farmers' Market : Grand Union-Hardwick, Buffalo Mtn. Co-Op-Hardwick
- Johnson Farmers' Market : Grand Union-Johnson
- Montpelier Farmers' Market : Shaw's-Montpelier, Hannaford-South Barre, Hunger Mtn. Co-Op-Montpelier
- Poultney Farmers' Market : Shaw's-Poultney
- Richmond Farmers' Market : Richmond Corner Market-Richmond
- Rutland Farmers' Market : Hannaford's-Rutland

Prices were collected for 12 core items, with 14 total comparisons occurring because cucumbers were compared per pound and per cucumber while lettuce was compared for mixed varieties and per head. The selection criteria focused primarily on items a consumer would likely find at both the farmers' market and grocery store, with a secondary consideration given to items that were thought to be staples in the average consumers' diet. In order to ensure that the items on the list being compared were equivalent, a great deal of care was applied to defining the specific variety of each item to compare between farmers' markets and grocery stores. For instance, cucumbers were limited to slicing varieties, and did not include pickling or miniature varieties.

Additionally, a price per pound unit was used to compare prices whenever possible, in order to ensure that the prices being compared were according to a standard unit of measurement. We recognized that certain items at both the farmers' markets and grocery stores are often priced per item, or in the case of blueberries, per pint or quart. For these items, we used the alternative pricing unit. Whenever possible, we asked vendors with scales who had items that we sought a

per pound price for but weren't priced per pound to weigh the item for conversion. Though, on the whole, we tried to limit egregious interference with market commerce and simply omitted prices that weren't priced per pound for the items that we sought a per pound price for. Also, it should be noted that not all vendors have state approved scales, and therefore are unable to price items per pound. Unfortunately, we could only record prices of items that were priced in an alternative unit from these vendors. Regardless, we would like to remind readers that items priced and compared in alternative units like price per item, are not necessarily equivalent. For example, two cucumbers each priced at .75 cents, may actually vary in size, and therefore weight.

With this in mind, the following list includes the items we collected prices for, the specific variety of the item, along with whether or not that item was priced per pound or per item:

- Blueberries: Priced per pint.
- Cantaloupe: Priced per pound.
- Corn: Sweet corn on the cob, priced per ear.
- Cucumbers: No pickling varieties or special varieties like European or miniature cucumbers. Priced per pound and priced per cucumber.
- Eggs: Large Grade A, priced per dozen.
- Peppers: Green bell peppers, priced per pound.
- Lettuce: Mesclun and spring mix cut varieties, priced per pound. Head lettuces, priced per head.
- Potatoes: Yukon gold and red skinned potatoes—no fingerlings—priced per pound.
- Peas: Snow peas, priced per pound.
- String beans: Only green—no other colored varieties—priced per pound.
- Squash: Yellow summer squash, priced per pound.
- Tomatoes: Slicing varieties, priced per pound.

At farmers' markets we recorded prices from each vendor who sold an item that was on our list. For example, at a farmer's market, multiple vendors may be selling tomatoes, so at each visit to the market, prices for tomatoes were collected from each vendor selling tomatoes. Similarly, at grocery stores we recorded the prices for every offering of an item on our list. For instance, a grocery store might have two or three brands of spring mix lettuce available. If this was the case, the price for each offering was recorded. Adopting this approach provides a larger sample size in addition to a comprehensive view of prices that consumers can expect to encounter at both farmers' markets and grocery stores. Furthermore, in our view, it increases vendors' and consumers' confidence in the average prices listed in the report; that is, vendors may be more likely to use the average prices as a guide for future pricing decisions and consumers may be more likely to use the prices as a guide for purchasing decisions. Lastly, it provides insights as to how prices at each farmers' market change as the growing season progresses, and how individual vendors may be setting prices in relation to other vendors.

Price collection for farmers' markets and grocery stores also delineated between conventional items and certified organic items. Making this distinction at grocery stores is rather easy, as organic items are clearly segregated from their conventional counterparts. Though labeling at farmers markets was certainly clear, with certified organic growers displaying signage indicating that they were certified, growing methods often occur on a scale that is not so easily segregated into organic and conventional practices. One of the advantages of going to farmers' markets is the ability to interact with growers and ask questions about their growing methods. At a grocery store, where product labeling must essentially speak for growers' methods, a product is clearly either organic or conventional—and the certified organic label is the only way in which this distinction is reliably conveyed to consumers. In other words, the certification process and the associated labeling is an essential communicative measure for organic wholesale growers.

At the farmers' market, however, where you can directly communicate with growers, you'll find growers who may implement the majority of, or all of the certified organic practices, but ostensibly lack organic certification. At the farmers' market, a grower may find that direct communication is equivalent to the organic certification process and label. Therefore, growers who sell at farmers' markets may not have as strong of an incentive to pursue certification. The point is that, though only certified organic items were treated as organic in the price delineation for farmers' markets, it is possible that items listed as conventional at farmers' markets are in fact organic or primarily organic. However, this points to one of the advantages that organic certification and subsequent labeling provides even at farmers' markets; it addresses the opportunity costs for growers associated with explaining in detail to customers why one isn't certified, but still adopts organic practices. Organic labeling at farmers' markets also serves the same role of assurance that it does at grocery stores for consumers who aren't willing or don't have the time to ask a grower about their practices. Nevertheless, it is important to acknowledge and recognize that the conventional price comparisons for items at farmers' markets and grocery stores are not necessarily exact equivalents.

Our analysis of price comparisons includes statistical t-tests. We conducted the statistical t-tests on the means for each item, doing so for the means of both conventional and organic items. A statistical t-test can be thought of as a way to test a particular hypothesis, and reveals whether or not there is a statistically significant difference between means of two independent samples of data. The null-hypothesis states that there is no difference between the means of two different samples, while the alternative hypothesis states that there is a difference between the means of two different samples. Conducting the statistical analysis produces a p-value, which indicates the probability of observing the sample mean if the null hypothesis were true.

For example, our null hypothesis for each item comparison is that there is no difference between the mean price of the farmers' market item and the grocery store item. Say a p-value of .03 is observed in the statistical analysis. This reveals that if the means of farmers' market prices and grocery store prices are equal, there would be a 3 percent chance of obtaining the data that we observed. Because a p-value of .03 is highly unlikely if we assumed the two means of the distributions were equal, we call into question the validity of the null hypothesis. Consequently, we reject the null hypothesis and state that the observed difference in prices is indeed statistically significant. We have used a level of significance of .05. That is, a p-value of .05 or lower is considered low enough to reject the null hypothesis, while a p-value greater than .05 means that we fail to reject the null hypothesis. When we fail to reject the null hypothesis, this indicates that the difference in prices is not statistically distinct. Essentially, the statistical test is a way to further determine if the observed differences in price are simply due to chance or error, or if the observed differences are indeed the result of an actual difference in prices.

Results

The first section of our results will provide an overview of the price comparisons between items at the farmers market and items at the grocery store. The comparisons are broken down into a farmers' market conventional vs. grocery store conventional items comparison, farmers' market organic vs. grocery store and co-op organic items comparison, and a farmers' market organic vs. grocery store conventional item comparison. Co-ops were only considered for the organic comparisons because the majority of observations, approximately 75%, were organic observations. Thus, conventional item observations at the co-ops were either altogether absent or comprised of an insignificant number of observations for meaningful comparison. The prices

for each item comparison in all formats is the mean price of the item, and represents the average price across all farmers' markets and grocery stores involved in the study.

Following the overview price comparisons, we have included a more detailed item by item analysis, which includes regional price comparisons, and for some items, a seasonal variation price comparison.

Farmers' Market Conventional Vs. Grocery Store Conventional

Figure 1 shows the conventional vs. conventional price comparison results.

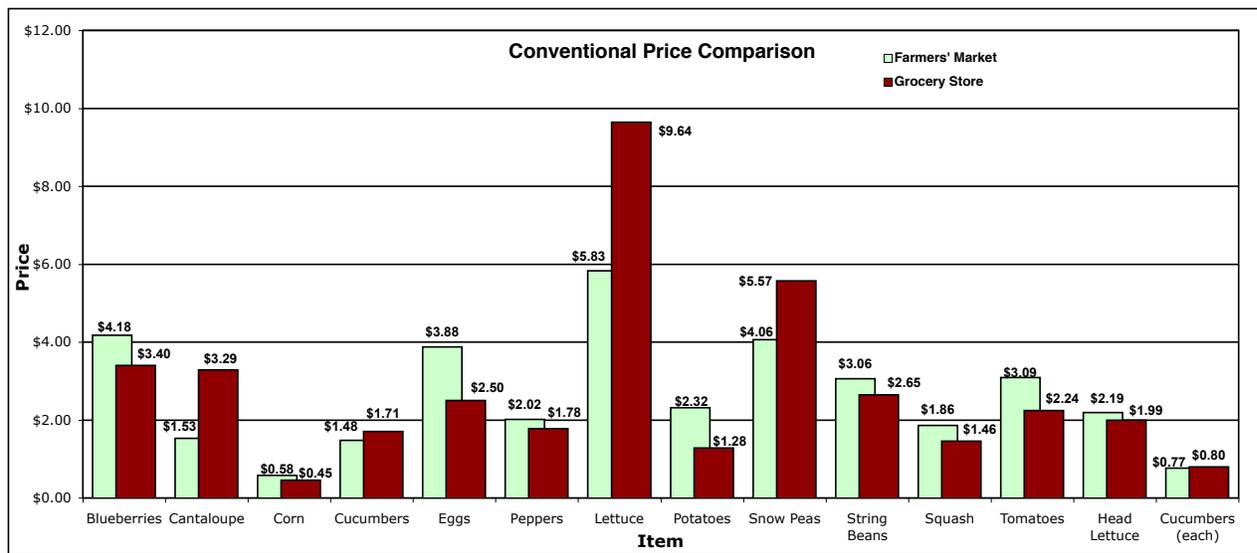


Figure 1

When comparing conventional prices between farmers' markets and grocery stores, farmers' market prices are lower for 5 out of the 14 ($\approx 36\%$) items compared, if one considers that cucumbers are cheaper by the pound and per cucumber as well. Surprisingly, one of the largest percent differences is between mesclun and spring mix lettuces. There is 49.7% difference between conventional lettuce mixes at farmers' markets and conventional mixed lettuces at grocery stores. Cantaloupe, cucumbers, and snow peas were the other items that had a lower average price at farmers' markets. Cantaloupe had the highest observed percent difference of 73.0%, while cucumbers priced per cucumber had the lowest observed percent difference of 3.82%.

Grocery store items were cheaper for 9 out of the 14 ($\approx 64\%$) items compared. The greatest percentage differences were observed between eggs and potatoes, with percent differences of 43.3% for conventional eggs and 57.8% for conventional potatoes. Neither of these differences is particularly unexpected.

Producers of local eggs selling at farmers' markets do not operate at nearly the level of production that conventional egg producers do, lacking the overall economy of scale that industrial egg facilities enjoy. Also, treating conventional eggs at farmers' markets equivalent with conventional eggs at grocery stores is particularly difficult, because the practices of those selling locally at the farmers' market, particularly related to animal welfare, may align more closely to organic practices.

As with eggs, the economy of scale that a conventional potato producer operates at is far greater than a local Vermont farmer selling at a farmers' market. The comparative advantage afforded to conventional potato producers through greater scale of production and possibly

optimal climatic conditions, therefore, is likely indicated in the price difference for conventional potatoes.

If one were to factor out eggs and potatoes, the average percent difference between the prices of the remaining 7 conventional items (blueberries, corn, peppers, string beans, squash, tomatoes, and head lettuce) would only be 19.8%, with the lowest percent difference of only 9.57% existing between conventional grocery head lettuce and conventional farmers' market head lettuce.

Farmers' Market Organic Vs. Grocery Store Organic and Co-op Organic

Figure 2 shows the organic vs. organic price comparison results.

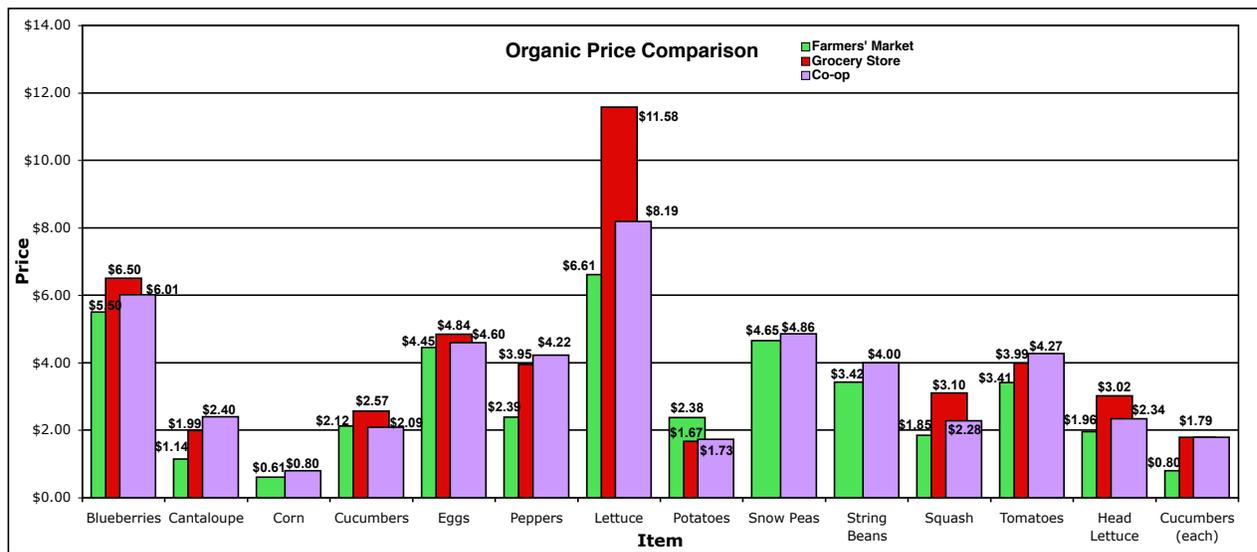


Figure 2

Organic prices at farmers' markets were less than organic prices at grocery stores for every item other than potatoes, and less than every item other than cucumbers per pound and potatoes at co-ops. There is on average a 38.8% difference between the price of organic items that were cheaper at farmers' markets and the price of organic items at grocery stores, and a 28.7% difference between the farmers' market organic items and their co-op counterparts. There were no organic observations at grocery stores for corn, snow peas, or string beans. In fact, only $\approx 17\%$ of total observations at grocery stores comprised of organic items. In contrast, $\approx 53\%$ of total observations at farmers' markets comprised of organic items, indicating that organic producers in Vermont have a healthy share of the overall local market, at least at farmers' markets. It is also of interest that of the farmers at farmers' markets who did not have certification, 57% identified their practices as organic.

Farmers' Market Organic Vs. Grocery Store Conventional

Because organic observations comprised of slightly more than half of all observations at farmers' markets, a comparison of organic prices at farmers' markets with conventional prices at grocery stores seems appropriate. Organic items at Vermont farmers' have in a sense become a conventional offering, in so far that one can go to a farmers' market and reasonably expect there to be a wide range of organic offerings. As we have seen with the organic vs. organic comparison, the substantially greater supply of organic items at farmers' markets may be playing

a part in making those items more price competitive than organic items at grocery stores. In other words, the scarcity of organic items at grocery stores is partly responsible for the price premium received by those organic items. Consequently, it becomes pertinent to see how price competitive a more abundant supply of organic items at farmers' markets is with conventional items at grocery stores.

Figure 3 below, shows the price comparison between organic items at farmers' markets with conventional items at grocery stores.

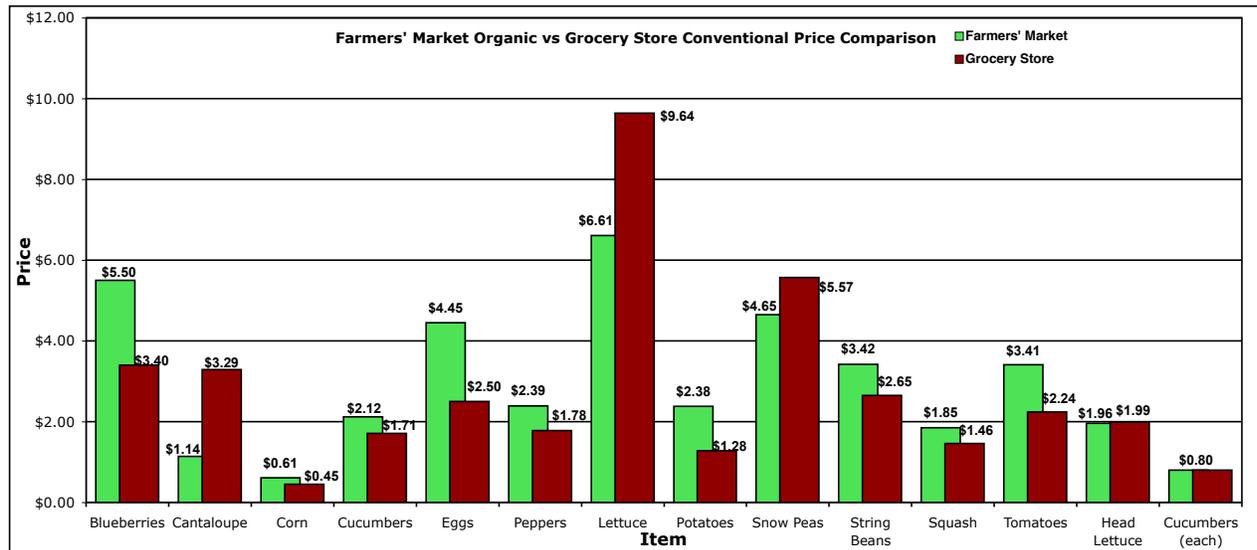


Figure 3

Organic prices at farmers' markets were less for 4 out of the 14 items ($\approx 29\%$), with prices for 9 out of the 14 ($\approx 64\%$) conventional items being less at grocery stores. The average price per cucumber was the same in each case. As with the conventional vs. conventional comparison, average prices for organic cantaloupe, lettuce, and snow peas were less than the conventional grocery price for these items. There were, however, a small number of observations for cantaloupe. Organic head lettuce as well, by a slight margin, was less than the conventional option at grocery stores.

Once again, it is not surprising that conventional eggs and potatoes are notably less at grocery stores. Eggs, especially, because organic feed for chickens is significantly higher than conventional chicken feed. Examining the percent differences in which the prices of conventional grocery items at grocery stores were less than the organic items at farmers markets, excluding eggs and potatoes, reveals an average percent difference of 31.2%.

Item-By-Item Analysis

The following section will take an in depth look at each item, providing a closer inspection of price differences including statistical significance and differences in prices between counties. We have decided to exclude an in-depth analysis of cantaloupe due to a small sample size. For 5 items, an analysis of seasonal price variability is also provided, comparing and contrasting how the price for an item at both farmers' markets and grocery stores changes through time.

Blueberries

At farmers’ markets we recorded a total of 28 observations for blueberries, 20 conventional and 8 organic. At grocery stores we recorded a total of 49 observations for blueberries, 39 conventional and 10 organic. We observed a total of 13 organic blueberry observations at co-ops. There is a 20.6% difference between the observed mean price for conventional blueberries at farmers’ markets and the observed mean price for conventional blueberries at grocery stores, and the observed difference in means is statistically significant (p-value = .002). There is a 16.7% difference between the observed mean price for organic blueberries at farmers’ markets and the observed mean price for organic blueberries at grocery stores, and the observed difference in means is statistically significant (p-value = .034). There is a 47.2% difference between the observed mean price for organic blueberries at farmers’ markets and the observed mean price for conventional blueberries at grocery stores, and the observed difference in means is statistically significant (p-value = .0003). Lastly there is an 8.86% difference between the observed mean price for organic blueberries at farmers’ markets and the observed mean price for organic blueberries at co-ops, and the observed difference in means is statistically significant (p-value = .023).

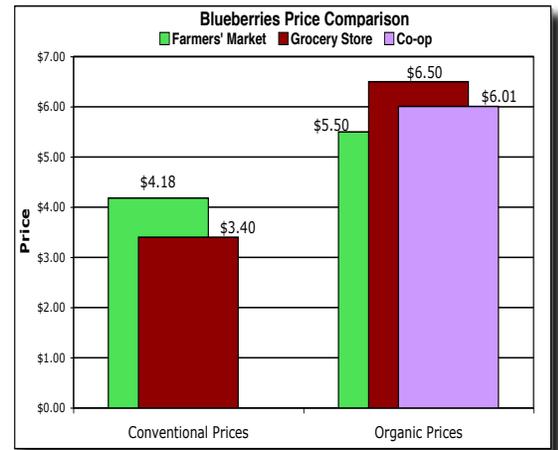


Figure 4

The lowest conventional price observed at grocery stores was \$1.99/pint, while the lowest conventional price observed at farmers’ markets was \$3.00/pint. Both shared a high value of \$5.00/pint, though it occurred more frequently at farmers’ markets (7 out of 20) than it did at grocery stores (2 out of 39). In fact 14 of the 20 (70%) conventional observations at farmers’ markets were either \$4.00/pint or \$5.00/pint (7 each). The mode—the most frequently observed price—at grocery stores was \$3.99/pint, which suggests that \$4.00/pint—which was the tied with \$5.00/pint as the most observed price at farmers’ markets—is a relatively competitive baseline price for conventional blueberries being sold at farmers’ markets.

Additionally, because \$4.00/pint was a frequently occurring price at farmers’ markets, one can infer that producers at farmers’ markets are capable of selling at or around the \$4.00 price point. The median price—the price that separates the top half of observations and the lower half of observations—and second most frequently occurring price at grocery stores was \$2.99/pint. Producers at farmers’ markets in the future may want to consider \$2.99/pint a competitive sale price for blueberries.

Though the sample size for organic blueberries was low, it appears that organic blueberries at farmers’ markets are price competitive with, and indeed lower than, organic blueberries at grocery stores and co-ops. 5 out of the 8 observations at farmers’ markets were priced between \$4.00/pint and \$5.00/pint, with the remaining 3 observations priced at \$7.50/pint. Considering that the organic prices were greater than \$6.00/pint at both grocery stores and co-ops, the mean price of \$5.50/pint at farmers’ markets appears to be a good value and baseline price for organic blueberries.

Figure 5 shows the mean blueberry prices for each county involved in our study.

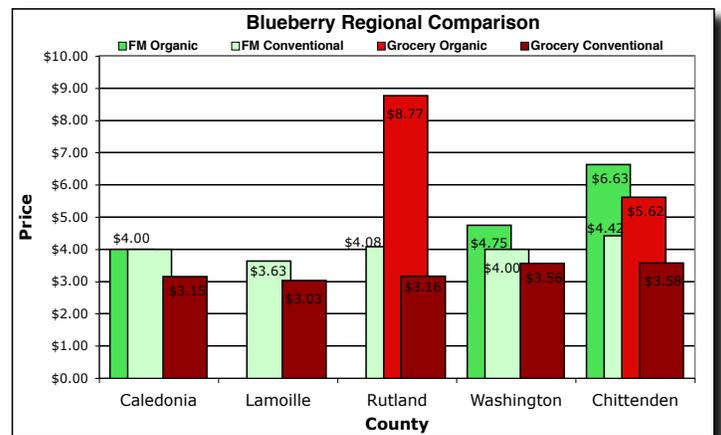


Figure 5

Corn

At farmers' markets we recorded a total of 60 observations for corn, 30 conventional and 30 organic. At grocery stores all 39 of the observations for corn that we recorded were conventional. At co-ops, we recorded 9 organic observations for corn. There is a 25.2% difference between the observed mean price for conventional corn at farmers' markets and the observed mean price for conventional corn at grocery stores, and the observed difference in means is statistically significant (p -value = .001). There is a 26.9% difference between the observed mean price for organic corn at farmers' markets and the observed mean price for conventional corn at grocery stores, and the observed difference in means is statistically significant (p -value = .0001). There is a 30.2% difference between the observed mean price for organic corn at farmers' markets and the observed mean price for organic corn at co-ops, and the observed difference in means is statistically significant (t -test p -value = .004).

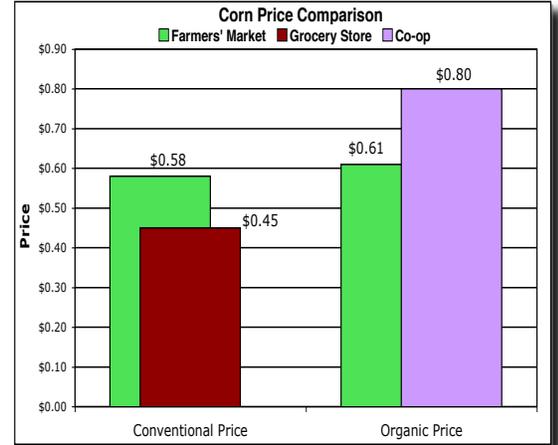


Figure 6

Note that though corn was priced and recorded per ear, it was often sold per dozen or half dozen. There were instances where sales at grocery stores for a dozen or half dozen ears of corn amounted to per ear prices between \$0.16-\$0.40. 13 of the 39 grocery observations fell between this price range (33%), whereas there were only 3 observations out of the total 60 (5%) farmers' market observations that were under \$0.40/ear. These lower per dozen and half dozen prices are therefore influencing the mean value at grocery stores more so than they are at farmers' markets.

Examining the median and mode for corn at grocery stores, which are \$0.49/ear and \$0.50/ear respectively, reveals that the differences between corn prices at grocery stores and farmers' markets is perhaps not as large as the mean values suggest. The mode for the price of conventional corn at farmers' markets is identical at \$0.50/ear, while the median is very close to the grocery median at \$0.54/ear. The two most frequently occurring prices for organic corn at farmers' markets are \$0.75/ear and \$0.50/ear, making up 19 of the 30 (63%) total organic observations. The frequency of the \$0.50/ear price for organic corn suggests that organic producers can be price competitive with conventional producers at both farmers' markets and grocery stores. It should also be emphasized that organic corn was not even available at grocery stores, so with regards to corn, consumers have more options to choose from at farmers' markets than they do at grocery stores.

Figure 7 shows the regional price comparisons for corn. It's clear here that Washington and Chittenden counties are influencing the conventional and organic farmers' markets prices upwards, while influencing the conventional price of corn at grocery stores downwards. Data collection did not occur as frequently at Rutland County farmers' markets and this may explain the absence of corn pricing data for Rutland County farmers' markets.

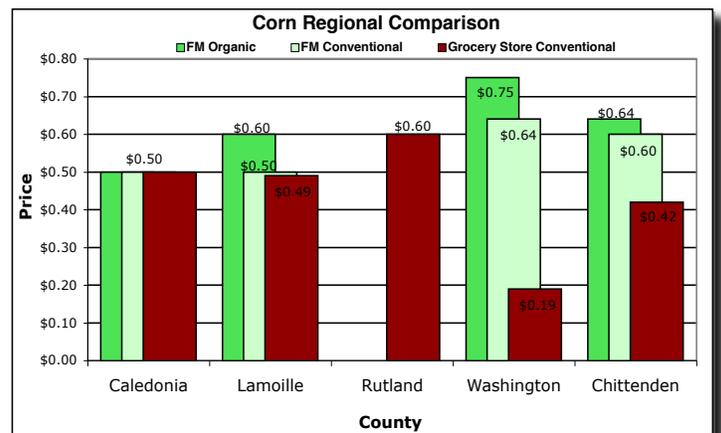


Figure 7

Cucumbers

The analysis for cucumbers will be for those that were priced per cucumber because the majority of our cucumber observations involved this price unit. At farmers' markets we recorded a total of 112 observations for cucumbers, 60 conventional and 52 organic. At grocery stores we recorded a total of 41 observations for cucumbers, 39 conventional and 2 organic. Because the number of organic observations for cucumbers priced per cucumber are so low for both grocery stores and co-ops (2 each) we have focused the statistical comparison between the conventional price per cucumber at grocery stores with the conventional and organic prices at farmers' markets. The t-tests reveal that the null hypothesis cannot be rejected for either the conventional vs. conventional comparison or the organic vs. conventional comparison (p-values of .51 and .97 respectively). Thus, the price difference for cucumbers per cucumber is not statistically significant in either case. This is expected as the mean prices are essentially the same for conventional cucumbers at farmers' markets and grocery stores, and indeed are the same for organic cucumbers at farmers markets and conventional cucumbers at grocery stores.

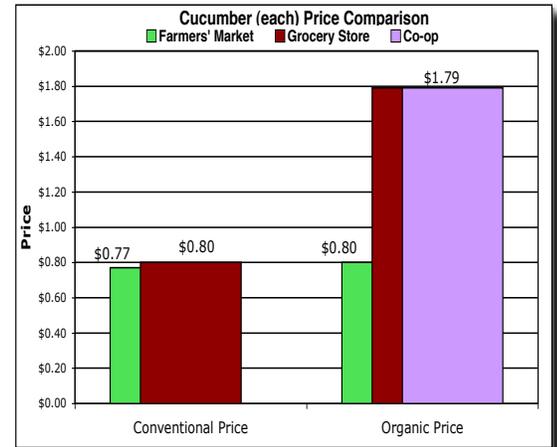


Figure 8

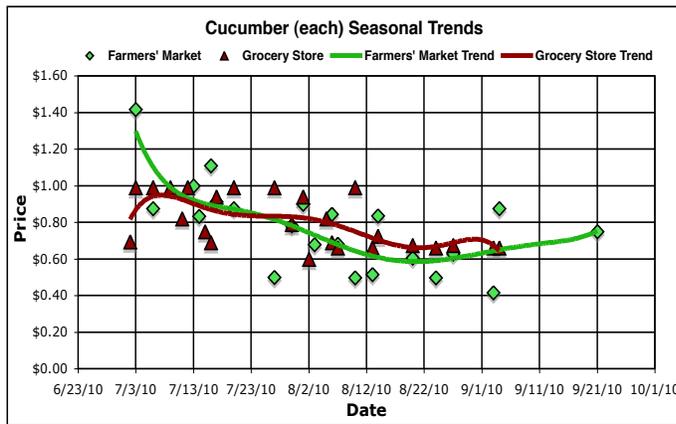


Figure 9

The median price for conventional cucumbers at grocery stores was the same as the median price of both farmers' market conventional and organic cucumbers at \$0.75/cucumber. Interestingly, the most frequently occurring value for conventional and organic cucumbers at farmers' markets was also \$0.75/cucumber, while at grocery stores the mode was higher at \$0.99/cucumber. Figure 9 shows the seasonal price trends for cucumbers at farmers' markets and grocery stores. Each data point on the graph is the average price for all observations recorded on that day.

One thing to keep in mind is that the trend lines do not fit the data points perfectly, and so should be treated as an approximation of price changes over time not an exact indicator of price change over time. However, one notices that the two lines are relatively identical, with a split occurring around July 2nd and continuing until September 1st in which the average farmers' market price drops below the average grocery store price. Prices in the range of \$0.60-\$0.80/cucumber appear to be consistently price competitive with grocery store cucumber prices.

Note as well that the data points on the farmers' market trend line includes both the organic price and the conventional price, whereas the grocery store trend line only includes the conventional price. In this case, because organic cucumbers at farmers' markets are nearly the same price on average as a conventional cucumber at farmers' markets, the farmers' market trend line is not affected upwards as it might be for other items where there is a difference in price between the organic and conventional item at farmers' markets. This is a point to keep in mind when examining proceeding seasonal graphs.

Figure 10 shows the regional price comparison for cucumbers. Once again Caledonia and Lamoille County display lower average prices at farmers' markets than the 3 other counties involved in the study.

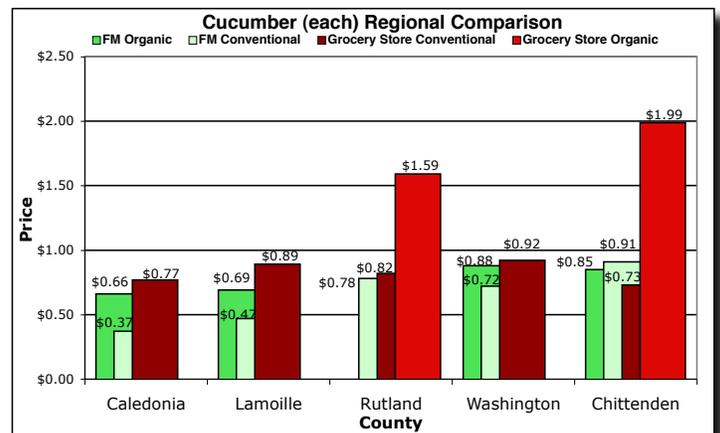


Figure 10

Eggs

At farmers' markets we recorded a total of 41 observations for eggs, 17 conventional and 24 organic. At grocery stores we recorded a total of 143 observations for eggs, 111 conventional and 32 organic. We recorded 22 organic egg observations at co-ops. There is a 43.3% difference between the observed mean price for conventional farmers' market eggs and the observed mean price for conventional grocery store eggs, and this difference is statistically significant (p -value = .0001). There is an 8.40% difference between the observed mean price for organic farmers' market eggs and the observed mean price for organic grocery store eggs, and this difference is statistically significant (p -value = .013). There is a 56.1% difference between the observed mean price for organic farmers' market eggs and the observed mean price for conventional grocery store eggs, with the difference in means being statistically significant as well (p -value = .0001). There is a 3.31% difference between the observed mean price for organic eggs at farmers' market and organic eggs at co-ops, but the difference in means is not statistically significant (p -value = .503).

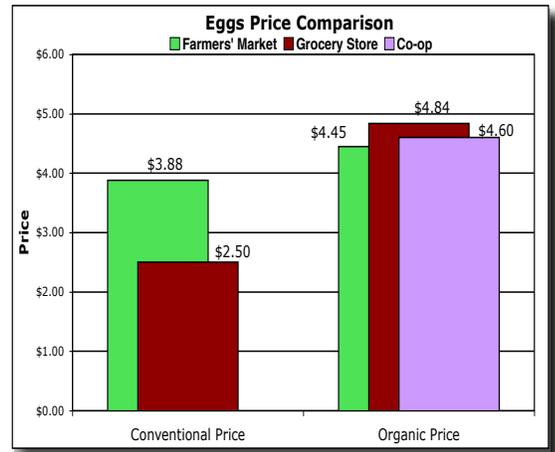


Figure 11

As previously discussed, the difference between conventional egg prices at grocery stores and at farmers' markets is not too surprising. Producers selling at the national level have literally hundreds of thousands layers, which affords them economies of scale that are simply not within reach for many of the diversified farms selling eggs in Vermont. Additionally, comparing conventional eggs proved to be difficult because of the range of management differences that may exist between conventional producers at farmers' markets and conventional producers at the grocery store. For instance, determining if eggs being sold at the farmers' market are free range, cage free, and antibiotic free is difficult in itself, but then determining if these eggs can be meaningfully compared with conventional grocery store eggs is additionally problematic. Future comparison studies should be aware of this particularly pronounced problem with conventional egg comparisons. Therefore, in the case of eggs, the organic comparison probably reveals more accurately the cost differences of eggs sold at farmers' markets and eggs sold at grocery stores, because certification requires that producers utilize the same practices. In other words, we can be more confident that an equivalent comparison is being made between organic eggs than we can with conventional eggs. Furthermore, the preponderance of organic eggs at farmers' markets suggests that organic egg production is well suited to Vermont farmers. The price advantage that local organic eggs have over organic grocery store eggs also suggests that patrons of farmers' markets can get a good value for organic eggs, supporting local and environmentally conscientious agriculture at a competitive price.

There is a concern, however, for lower income consumers at farmers' markets who may not be able to pay the still existing organic premium on eggs, especially when the majority of their egg choices at farmers' markets are organic or utilize organic practices. Compounding this concern is the fact that eggs constitute an important part of most peoples diet, being an affordable source of protein. Consequently, it would be prudent to explore pricing mechanisms that lessen the price burden for EBT users. Market managers and vendors could possibly explore stratified egg pricing for EBT users or once a month promotional sales that would make egg purchases more accessible to EBT users who otherwise would purchase eggs elsewhere. It is difficult to say if the market gains from a targeted pricing approach would be worthwhile for producers, especially if their supply is cleared at the price they currently offer for eggs. If the supply is not being cleared, however, then a stratified pricing approach may stimulate sales and benefit both consumers and producers.

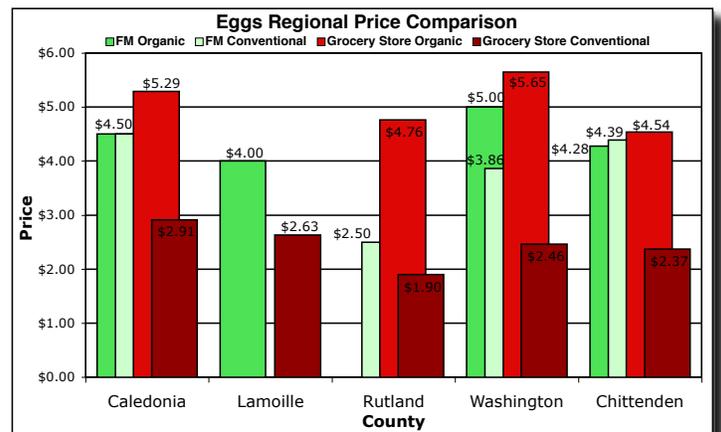


Figure 12

Figure 12 shows the regional price comparisons for eggs. Note that in Caledonia, the organic and conventional prices for farmers' market eggs are the same, and in Chittenden the organic eggs at farmers' markets are slightly less than the conventional eggs at farmers' markets.

Green Peppers

At farmers' markets we recorded a total of 65 green pepper observations, 26 conventional and 39 organic. At grocery stores we recorded a total of 51 green pepper observations, 42 conventional and 9 organic. We recorded 13 organic observations at co-ops. There is a 12.63% difference between the observed mean price for conventional peppers at farmers' markets and the observed mean price for conventional peppers at grocery stores, but the difference is not statistically significant (p -value = .24). There is a 49.2% difference between the observed mean price for organic peppers at farmers' markets and the observed mean price for organic peppers at grocery stores, and the difference in means is statistically significant (p -value = .0002). There is a 55.4% difference between the observed mean price for organic peppers at farmers markets and the observed mean price for peppers at co-ops, and the observed difference in means is statistically significant (p -value = .0001). There is a 29.3% difference between the observed mean price for organic peppers at farmers' markets and the observed mean price for organic peppers at grocery stores, and the observed difference in means is statistically significant (p -value = .002).

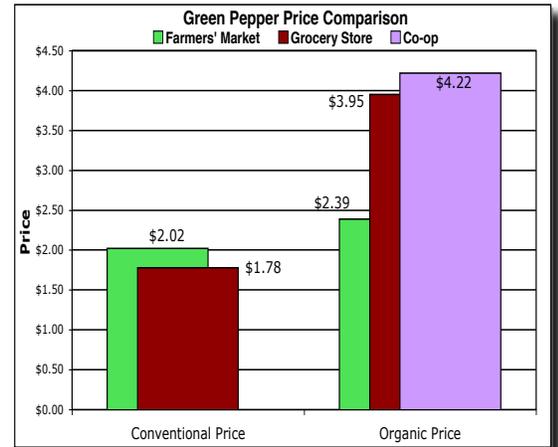


Figure 13

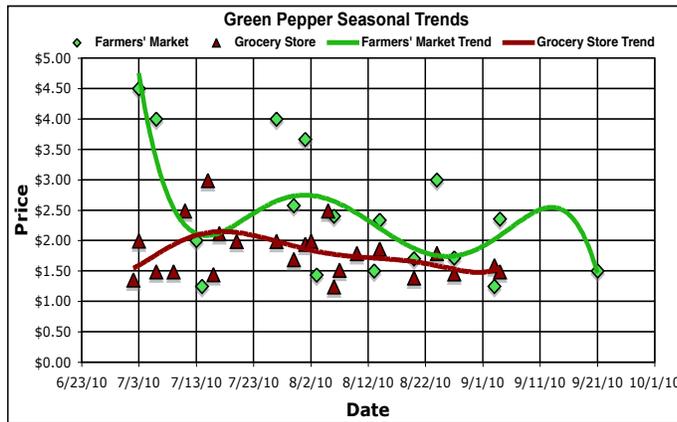


Figure 14

Examining the mode and median price reveals an interesting characteristic of the prices for green peppers. The conventional median price at farmers' markets is \$1.50/lb, whereas the conventional median price at grocery stores is \$1.67/lb. We can extrapolate from this that the difference in observed means, keeping in mind that the difference is not statistically significant, is the result of a greater variance—namely higher outliers—in prices occurring at farmers' markets. Indeed, this insight is confirmed in a statistical analysis of the variances. Additionally, the mode at farmers' markets for conventional and organic green peppers is also \$1.50/lb, while the mode at grocery stores for conventional peppers is \$1.99/lb. Thus, at farmers' markets, consumers are more likely to encounter a wider range of prices for peppers, but

are also very likely to encounter the \$1.50/lb price, which is less than the average price for conventional peppers at grocery stores. The seasonal trends shown in figure 14 visually demonstrate this point rather well. The trend line for farmers' markets looks like a wave function with multiple peaks and troughs, whereas the grocery store trend line holds relatively steady.

Green peppers are an item where more consistent pricing across farmers' markets may be especially beneficial. Prices in the range of \$1.50-\$2.50/lb would be relatively aligned with the trend line from late July to September, with conventional prices in the range of \$1.50-\$2.00/lb and organic prices in the range of \$2.00-\$2.50/lb. Although, once again organic items at farmers' markets, and specifically organic green peppers, have shown to be relatively price competitive with conventional offerings and substantially less than organic offerings at grocery stores. Ultimately, addressing the issue of price variance will go a long way to ensure customers that they can expect to encounter a stable price range for green peppers from week to week and market to market. Supply early in the year may not be substantial enough, however, for producers to justify a price that falls in the \$1.50-\$2.50/lb range. Yet as the trend line shows, the average price by July 13th is in the \$2.00/lb range, which intersects with the price for conventional grocery store green peppers, and suggests that farmers' market prices at that point can be price competitive with grocery store prices.

Figure 15 shows the regional comparisons for green peppers. Caledonia, Chittenden, and Washington County all have a mean farmers' market conventional price of \$2.00/lb or less.

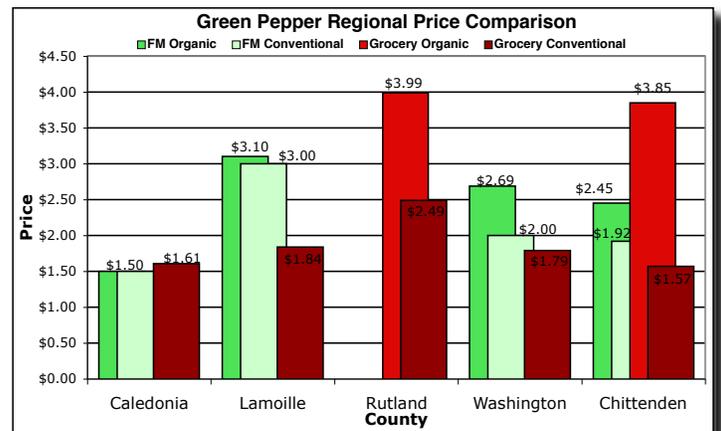


Figure 15

Head Lettuce

At farmers’ markets we recorded a total of 69 observations for head lettuce, 35 conventional and 34 organic. At grocery stores we recorded a total of 62 observations for head lettuce, 55 conventional and 7 organic. We recorded 8 organic observations of head lettuce at co-ops. There is a 9.57% difference between the observed mean price for conventional head lettuce at farmers’ markets and the observed mean price for conventional head lettuce at grocery stores, though the difference in means is not statistically significant (p-value = .43). There is a 42.6% difference between the observed mean price for organic head lettuce at farmers’ markets and the observed mean price for organic head lettuce at grocery stores, and the difference in means is statistically significant (p-value = .0001). There is a 1.52% difference between the observed mean price for organic head lettuce at farmers’ markets and the observed mean price for conventional head lettuce at grocery stores, but the difference in means is not statistically significant (p-value = .255). Lastly, there is a 17.67% difference between the observed mean price for organic head lettuce at farmers’ markets and the observed mean price for organic head lettuce at co-ops, though the difference in means is not statistically significant (p-value = .112).

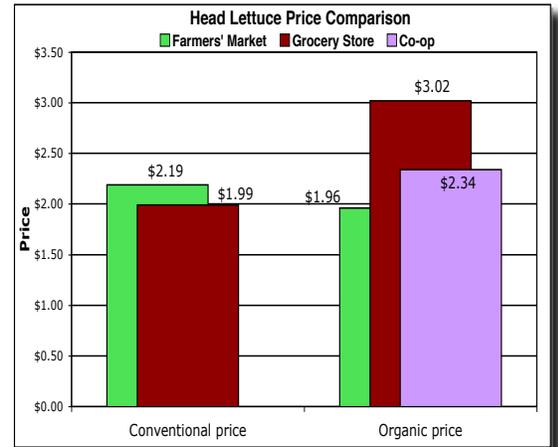


Figure 16

As the statistical analysis demonstrates, the only difference that we can confidently say is actual is the difference between the mean organic price at the farmers’ market and the mean organic price at the grocery store. Otherwise, all other price differences are not statistically significant and should be treated as being the same. Once again there is a noticeable disparity between the number of organic observations at farmers’ markets and the number of organic observations at grocery stores. Interestingly as well, the organic price on average was less than the conventional prices at both farmers’ markets and grocery stores.

It is important to consider that the conventional grocery store mean price includes observations of iceberg lettuce, which is thought to be the cheapest available head lettuce at grocery stores, while the farmers’ market observations were generally a variety of red and green head lettuces. We did not choose to exclude iceberg lettuce from our observations because it is a commonly purchased variety. However, due to this, the comparisons of head lettuce are not exact equivalents, because lettuce varieties at farmers’ markets do not include iceberg lettuce.

The ability to weigh heads of lettuce would have illuminated a more robust perspective on prices, because with the price per head unit we cannot provide any insight regarding the amount of lettuce a consumer is receiving for each head of lettuce purchased. Nonetheless, on a per head price basis, farmers’ market prices are clearly competitive, especially when priced in the \$1.50-\$2.00/head range, with organic head lettuce being a particularly good value.

Figure 17 shows the regional comparisons for head lettuce. The absence of grocery store data for head lettuce in Rutland and Washington County may be explained by the fact that head lettuce was a late addition to our list of items. Consequently, on the actual data sheets, head lettuce does not appear as a separate category. It’s plausible that some data collectors forgot about the addition or overlooked collecting prices for head lettuce while at the grocery store, focusing on cut leaf varieties.

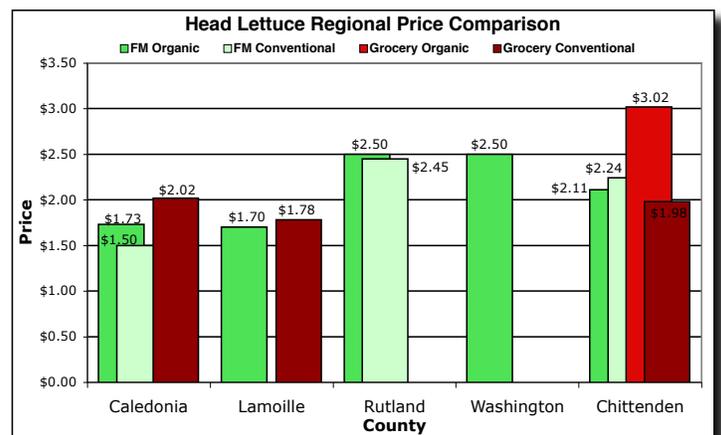


Figure 17

Mesclun and Spring Mix Lettuce

For this section mesclun and spring mix lettuce will be referred to as cut leaf lettuce.

At farmers' markets we recorded a total of 89 observations for cut leaf lettuce, 36 conventional and 53 organic. At grocery stores we recorded a total of 83 observations for cut leaf lettuce, 45 conventional and 38 organic. We recorded 15 observations of organic cut leaf lettuce at co-ops. There is a 49.3% difference between the observed mean price for conventional cut leaf lettuce at farmers' markets and the observed mean price for conventional cut leaf lettuce at grocery stores, and the difference in means is statistically significant (p -value = .0001). There is a 54.7% difference between the observed mean price for organic cut leaf lettuce at farmers' markets and the observed mean price for organic cut leaf lettuce at grocery stores, and the difference in means is statistically significant (p -value = .0001). There is a 37.3% difference between the observed mean price for organic cut leaf lettuce at farmers' markets and the observed mean price for conventional cut leaf lettuce at grocery stores, and the difference in means is statistically significant (p -value = .0001). Lastly, there is a 21.4% difference between the observed mean price for organic cut leaf lettuce at farmers' markets and the observed mean price for organic cut leaf lettuce at co-ops, and the difference in means is statistically significant (p -value = .048).

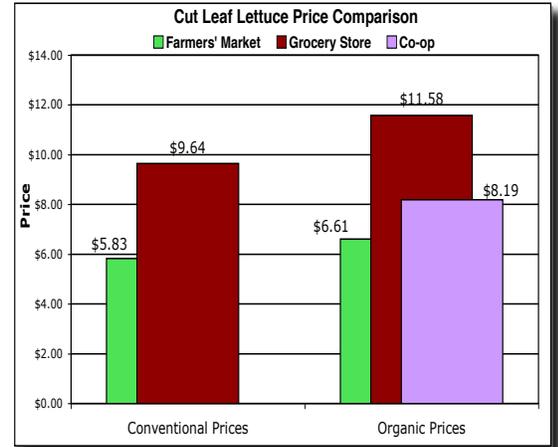


Figure 18

The price difference between cut leaf lettuces at farmers' markets and grocery stores was somewhat surprising. Perhaps contributing to the surprise is the fact that the per pound price unit is often not the one we pay attention to when purchasing cut leaf lettuces. Though one may purchase the packaged lettuce for \$3.38, a deeper inspection of the unit price might reveal a price of \$12.77/lb. The packaging itself, along with shipping, may be contributing to the substantially higher costs of cut leaf lettuces at grocery stores. Also, food safety concerns that result in lettuces that are washed more than once prior to packaging may also be contributing to higher costs. The fact that often times the cheapest options for cut leaf lettuce at grocery stores weren't packaged, and were sourced locally, for example, suggests that packaging and transportation costs are indeed the main contributing factors for the price disparity.

There was greater variance in organic cut leaf lettuce prices at farmers' markets, in part because some mixes included additions like pea shoots or edible flowers. We included the prices of these options, though if we were to take them out, the mean price would most likely experience a slight decrease. Nonetheless, the most frequently occurring price for organic cut leaf lettuce at farmers' markets was \$4.00/lb. Additionally, examining all cut leaf lettuce observations at farmers' markets reveals that 70 out of the 89 (~79%) observations are priced within the \$4.00-\$8.00/lb price range.

Figure 19 shows the regional price comparison for cut leaf lettuce. Though the graph displays Chittenden County with the relatively higher farmers' market price for cut leaf lettuce, keep in mind that the greatest number of observations came from this region. Furthermore, Chittenden is more densely populated, due to Burlington, and there may be an urban effect on price. Figure 19 demonstrates quite well, however, that consumers can expect to encounter a mean price of approximately \$8.00 or less when shopping for cut leaf lettuce at farmers' markets.

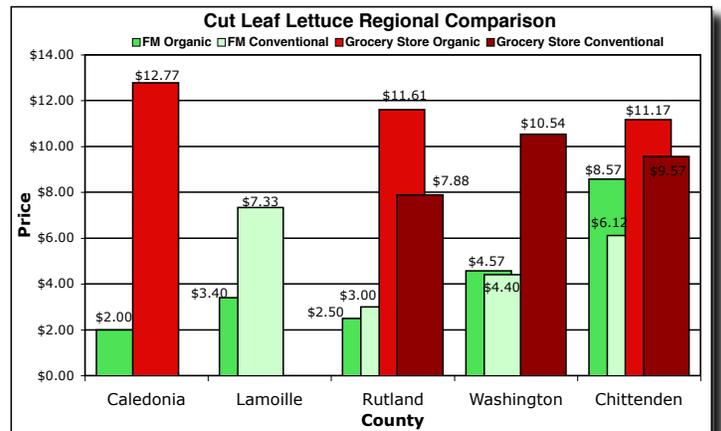


Figure 19

Potatoes

At Farmers' Markets we recorded a total of 78 observations for potatoes, 29 conventional and 49 organic. At grocery stores we recorded a total of 118 observations for potatoes, 108 conventional and 10 organic. We recorded 26 organic potato observations at co-ops. There is a 57.8% difference between the observed mean price for conventional potatoes at farmers' markets and the observed mean price for conventional potatoes at grocery stores, and the difference in means is statistically significant (p-value = .0001). There is a 35.1% difference between the observed mean price for organic potatoes at farmers' markets and the observed mean price for organic potatoes at grocery stores, and the difference in means is statistically significant (p-value = .0001). There is a 60.1% difference between the observed mean price for organic potatoes at farmers' markets and the observed mean price for conventional potatoes at grocery stores, and the difference in means is statistically significant (p-value = .0001). Lastly, there is a 31.6% difference between the observed mean price for organic potatoes at farmers' markets and the observed mean price for organic potatoes at co-ops, and the difference in means is statistically significant (p-value = .0001)

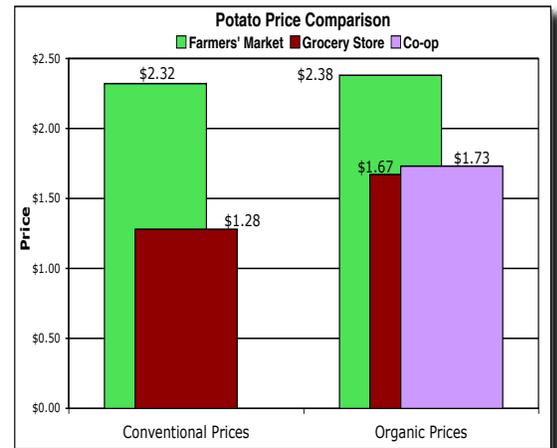


Figure 20

Potatoes were the only item on our list that across the board are on average more expensive at farmers' markets than they are at grocery stores. As previously discussed, this is not altogether a surprising result, due to the fact that potatoes are a staple commodity crop and national producers who sell wholesale are participating in a large consolidated production chain. In other words, they benefit from economies of scale. Consider, for example, the following two factors that illuminate the difference in production scale (1) The number of observations of conventional potatoes, 108, is 36% greater than the total number of observations at farmers' markets, and this number does not include varieties like the commonly consumed russet potato, and (2) potatoes at grocery stores are often sold in 5lb bags, while potatoes at farmers markets are sold or at the very least displayed in pint containers. The latter factor indicates that the volume of potatoes offered at grocery stores is considerably greater than the volume of potatoes being offered at Vermont farmers' markets. Furthermore, with the rise in winter farmers' markets and winter CSAs in Vermont, producers selling during the winter may be managing their summer supply for tubers that store well in order to sell them later in the year.

Putting aside the factors that may be contributing to the price difference, because potatoes are a major commodity crop they invariably are cheap and make up an important portion of many peoples diets, as is the case with eggs. Consider, for example, that the mode for conventional potatoes at grocery stores was \$0.80/lb, 60% less than the most frequently occurring price for conventional potatoes at farmers' markets (\$2.00/lb). Those with less expendable income may continue to choose the grocery store for the majority of their food purchases if the price of primary staples like potatoes and eggs remain considerably less than the price offered at farmers' markets. The price difference for the commodity items are potentially acting as barriers to accessing other items at the farmers' market that are actually price competitive with their grocery store counterparts.

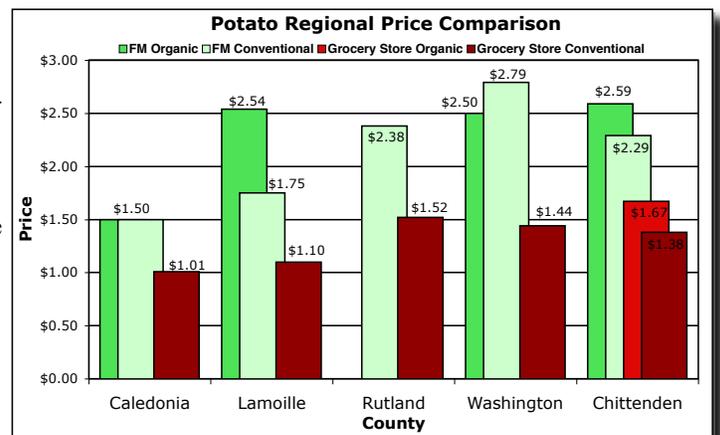


Figure 21

Indeed, the price difference of these common commodity items may largely be fueling the overall perception that prices at farmers markets are much more expensive than the prices at grocery stores, because they are more price sensitive to these items. At this point these are assumptions that would need further verification, but are plausible nonetheless. Similar to the situation with egg prices, farmers' markets could explore stratified pricing for potatoes, providing coupons for EBT users or simply offering them a discounted price. Again, this would depend on the current sales of producers at farmers' markets who sell potatoes. If producers are clearing their supply at the current prices, it would be more difficult to justify a stratified price. Furthermore, organic producers may find that the costs to grow potatoes organically are simply too great, the labor requirements too intensive, to justify lowering the price beyond a certain point.

Snow Peas

At farmers' markets we recorded a total of 33 observations for snow peas, 23 conventional and 10 organic. At grocery stores we recorded a total of 24 observations for snow peas, with all the observations being conventional. We recorded a total 6 organic observations of snow peas at co-ops. There is a 31.4% difference between the observed mean price for conventional snow peas at farmers' markets and the observed mean price for conventional snow peas at grocery stores, and the difference in means is statistically significant (p -value = .001). There is an 18% difference between the observed mean price for organic snow peas at farmers' markets and the observed mean price for conventional snow peas at farmers' markets, though the difference in means is not statistically significant (p -value = .097). Lastly, there is a 4.42% difference between the observed mean price for organic snow peas at farmers' markets and the observed mean price for organic snow peas at co-ops, but the difference in means is not statistically significant (p -value = .472).

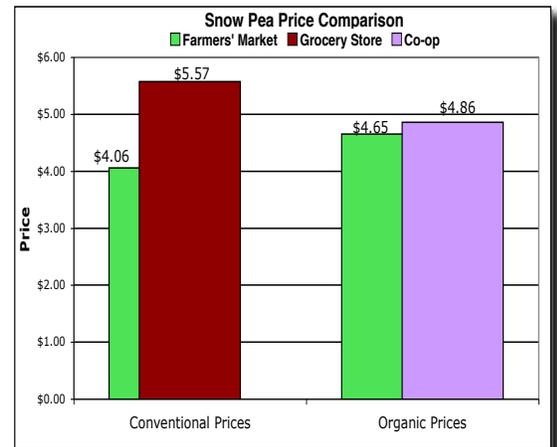


Figure 22

Conventional snow peas at farmers' markets are clearly price competitive. With a mean price of \$4.06/lb, and the most frequently occurring price of \$3.00/lb, producers at farmers' markets appear capable of selling conventional snow peas in the \$3.00-\$4.00/lb price range. Comparatively, the most frequently occurring price at grocery stores for conventional snow peas was \$6.69/lb. The price difference between organic snow peas at farmers' markets and conventional snow peas at grocery stores was not significant, however, this may in large part be the result of a small sample size especially for organic snow peas. \$5.00/lb and \$6.00/lb made up 60% (6 of 10) of the total organic snow pea observations at farmers' markets, suggesting that it is reasonable to price organic snow peas within the \$5.00-\$6.00/lb range and that this price range is price competitive with the conventional grocery store price for snow peas. The absence of organic observations at grocery stores is once again notable. Snow pea prices for consumers at the observed farmers' markets are not only less on average, but consumers have a greater variety to choose from as well.

Due to the substantial price difference between conventional snow peas at farmers markets and conventional snow peas at grocery stores, and the additional affordability of organic snow peas at farmers' markets, it may prove to be beneficial for producers at farmers' markets to provide recipes or simple preparation tips for snow peas. Research on EBT users has noted that cooking competency is another oft-cited barrier to purchasing items at farmers' markets. Highlighting snow peas affordability and ease of integration into preparations that many people are already familiar with would provide further impetus for individuals who may not be confident with their cooking skills to incorporate snow peas into their diet. In general, pairing items at farmers' markets that are affordable with preparation tips and recipes is an effective way to illuminate the strengths of the farmers' market to lower income groups.

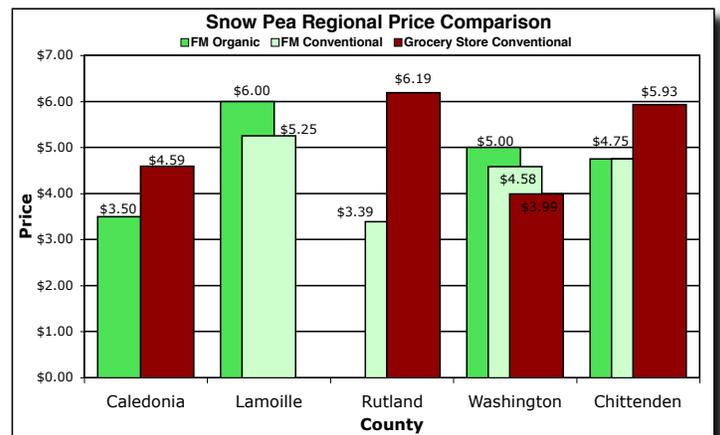


Figure 23

Figure 23 shows the regional price comparison for snow peas. Washington County is the only county sampled where the price per pound was less at grocery stores than it was at farmers' markets. Lamoille had the highest farmers' market prices for both conventional and organic snow peas.

String Beans

At farmers' markets we recorded a total of 90 observations for string beans, 47 conventional and 43 organic. At grocery stores we recorded a total of 35 observations for string beans, and all 35 observations were conventional. We recorded a total of 14 organic observations at co-ops. There is a 14.4% difference between the observed mean price for conventional string beans at farmers' markets and the observed mean price for conventional string beans at grocery stores, though the difference in means is not statistically significant (p -value = .07). There is a 25.37% difference between the observed mean price for organic string beans at farmers' markets and the observed mean price for conventional string beans at grocery stores, and the difference in means is statistically significant (p -value = .001). Lastly, there is a 15.6% difference between the observed mean price for organic string beans at farmers' markets and the observed mean price for organic string beans at co-ops, but the difference in means is not statistically significant (p -value = .14).



Figure 24

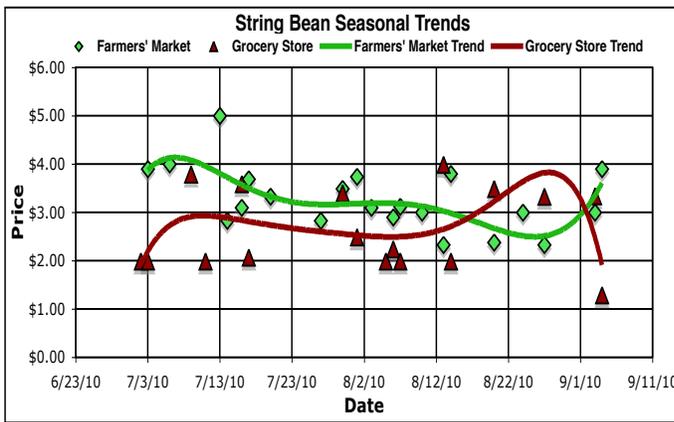


Figure 25

Figure 25 shows the seasonal trends for string beans at farmers' markets and grocery stores. One can see quite well from the periodic averages of the graph that the most frequently occurring mean price at grocery stores is approximately \$2.00/lb (\$1.99/lb to be exact). The farmers' market price gradually decreases over time, hovering around the \$2.50-\$3.00/lb price range from late July to early September. A slight majority of conventional observations at farmers' markets, 24 of the 47, ~51%, actually occurred between the price range of \$2.00-\$3.00/lb. Conventional string bean prices between \$2.00-\$2.50/lb at farmers' markets appears to be a reasonable target, and such a range would be price competitive with grocery store prices.

19 of the 47 (~40%) of the conventional observations were priced at \$3.50 or higher, which is, notably, higher than the organic mean price for string beans at farmers' markets. Reducing the price variability at farmers' markets would once again help consumers; giving them confidence that prices will be consistent between markets and ideally between vendors. Couple this with the fact that the mode for both conventional and organic string beans at farmers' markets was \$4.00/lb for string beans, and it is conceivable that some conventional growers are essentially receiving the organic price premium for their string beans.

Ultimately, there is little evidence to suggest that the observed price differences for string beans are substantial and can't be effectively ameliorated with a reduction in price variance. Also, due to the fact that once again there were no organic observations at grocery stores, there are opportunities for organic producers and market managers to contrast the substantial organic options at the farmers' market with the paucity of organic options at grocery stores. Doing so could help create greater loyalty to the market, and possibly introduce new consumers to the market who want to purchase organic food, but find it difficult to do so because of a lack of organic options at grocery stores.

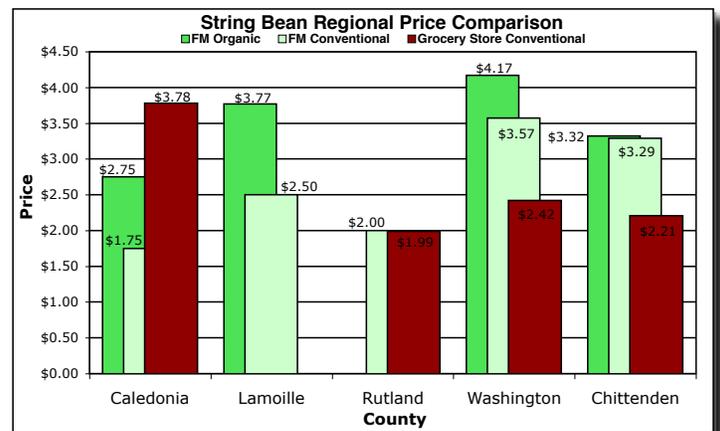


Figure 26

Squash

At farmers' markets we recorded a total of 111 observations for squash, 59 conventional and 52 organic. At grocery stores we recorded a total of 55 observations for squash, 44 conventional and 11 organic. We recorded a total of 14 organic observations at co-ops. There is a 24.1% difference between the observed mean price for conventional squash at farmers' markets and the observed mean price for conventional squash at grocery stores, and the observed difference in means is statistically significant (p -value = .0001). There is a 50.5% difference between the observed mean price for organic squash at farmers' markets and the observed mean price for organic squash at grocery stores, and the observed difference in means is statistically significant (p -value = .0001). There is a 23.6% difference between the observed mean price for organic squash at farmers' markets and the observed mean price for conventional squash at grocery stores, and the observed difference in means is also statistically significant (p -value = .0001). Lastly, there is a 20.8% difference between the observed mean price for organic squash at farmers' markets and the observed mean price for organic squash at co-ops, and the observed difference in means is statistically significant (p -value = .008).

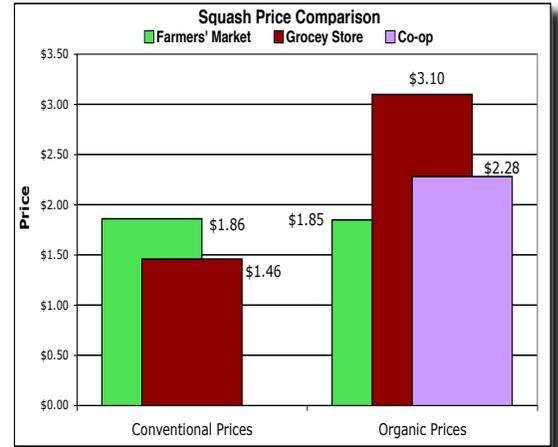


Figure 27

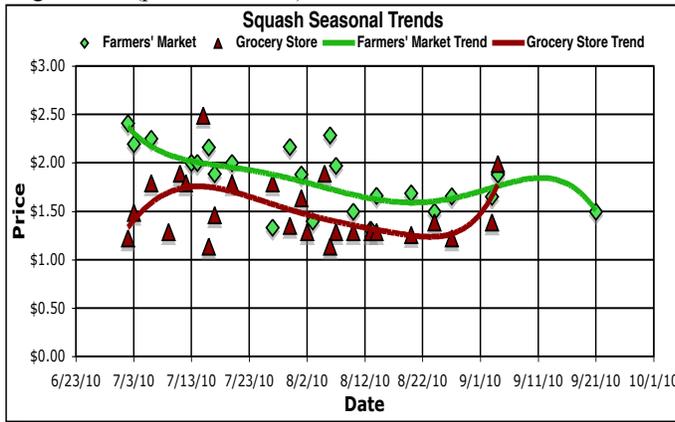


Figure 28

our study. Initially higher prices in the early season may be supply related, and as the growing season progresses, an influx of squash could be driving prices down. Also, market attendance may start off slowly early in the growing seasons, causing growers to compensate for lower sales volume by increasing the price per pound. However, it is conceivable that farmers' markets could stimulate demand in the early season by offering prices that are closer to the late season prices.

\$2.00/lb was the most frequently occurring price for both organic and conventional squash at farmers' markets, followed in each case by \$1.50/lb. In fact, 61 of the 111 (~55%) total observations were priced at either \$2.00/lb or \$1.50/lb at farmers' markets. The farmers' market trend line displayed in figure 28 shows that after July 23rd, average squash prices began to be observed at or around the \$1.50/lb price. Figure 28 also shows that the majority of average weekly conventional squash prices at grocery stores occurred below the \$1.50/lb price. This is reflected by a mode of \$1.29/lb for conventional squash at grocery stores.

Squash is clearly abundant at farmers' markets, and an item that was observed consistently throughout the time span of

Either way, late season price trends suggest that the price gap between farmers' markets and grocery stores could be closed with some minor pricing adjustments. Furthermore, in the case of squash we did observe locally grown squash in some grocery stores, and these local options were typically priced at \$1.29/lb. A price of \$1.50/lb for conventionally grown squash appears to be an appropriate price target, one that many producers already sell at for the entire growing season. Organically grown squash sold between \$1.50-\$2.00/lb seems appropriate as well, and is something that many organic producers are already doing. The \$1.50-\$2.00/lb price range for organic squash is clearly price competitive with organic prices at grocery stores, and another strength that farmers' markets should look to exploit. Because squash is particularly ubiquitous at farmers' markets it would be beneficial to make a concerted effort to make prices more consistently affordable, eliminating initial price variability such that more price conscious consumers would have greater incentive to visit the market throughout the growing season.

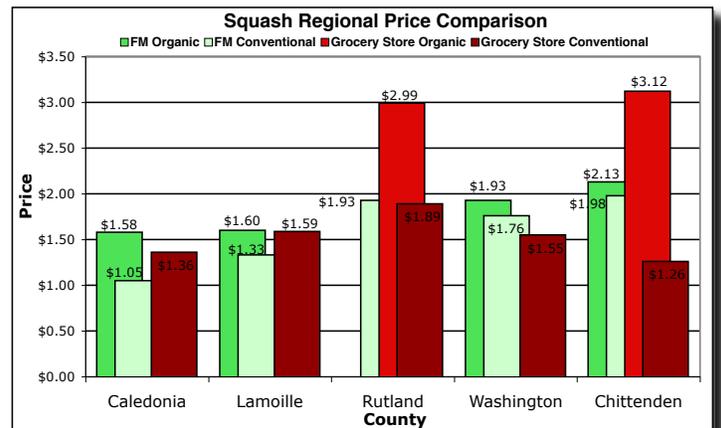


Figure 29

Tomatoes

At farmers' markets we recorded a total of 114 observations for tomatoes, 49 conventional and 65 organic. At grocery stores we recorded a total of 91 observations for tomatoes, 88 conventional and 3 organic. We recorded 26 organic observations at co-ops. There is a 31.9% difference between the observed mean price for conventional tomatoes at farmers' markets and the observed mean price for conventional tomatoes at grocery stores, and the observed difference in means is statistically significant (p-value = .0001). There is a 15.7% difference between the observed mean price for organic tomatoes at farmers' markets and the observed mean price for organic tomatoes at grocery stores. Because there were only 3 organic observations at grocery stores, and all three were priced at \$3.99, we did not conduct a statistical test. There is a 41.4% difference between the observed mean price for organic tomatoes at farmers' markets and the observed mean price for conventional tomatoes at grocery stores, and the observed difference in means is statistically significant (p-value = .0001). Lastly, there is a 22.4% difference between the observed mean price for organic tomatoes at farmers' markets and the observed mean price for organic tomatoes at co-ops, and the observed difference in means is statistically significant (p-value = .0003).

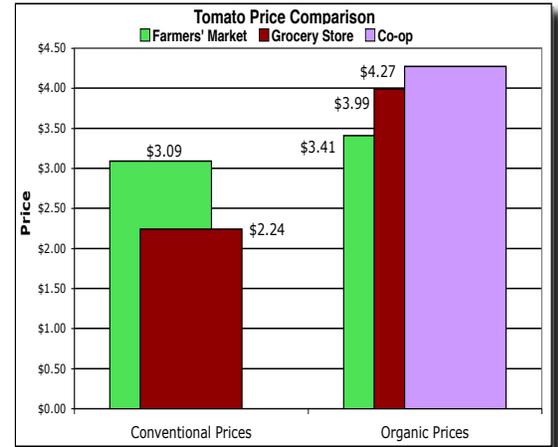


Figure 30

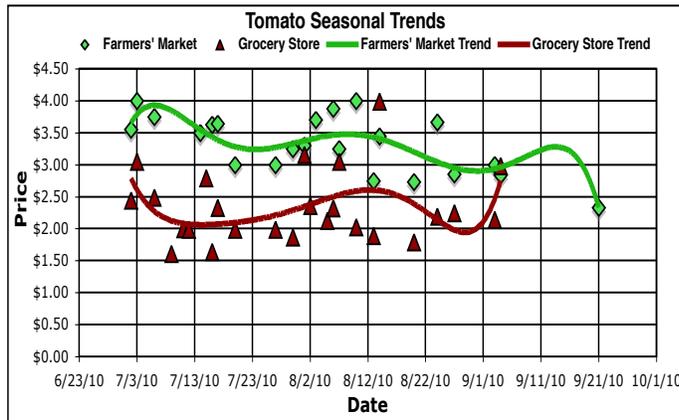


Figure 31

Figure 31 shows that the average price for conventional tomatoes at grocery stores was consistently less than tomatoes at farmers' markets throughout the growing season. A majority of the average prices at grocery stores fall around and within the \$2.00-\$2.50/lb price range. As with the other items in which we analyzed the seasonal trends, there is a gradual decline in price at farmers' markets as the growing season progresses. Interestingly, the mode for organic tomatoes at farmers' markets was \$3.00/lb, while for conventional tomatoes at farmers' markets it was \$4.00/lb. Though 31 of the 49 of conventional farmers' market observations, ~63%, fell within the \$2.00-\$3.75/lb price range. At grocery stores there were more instances of tomatoes priced at \$1.00/lb or less, due to store specials, and in general more prices that were less than \$2.00/lb (42 instances or close to half at grocery stores, in comparison to a total of 4 instances at farmers' markets).

Tomatoes are difficult to compare on price alone, perhaps more so than other produce items. There are attributes related to quality that may not be explicitly apparent in the price. For example, producers at farmers' markets selling tomatoes at the \$4.00-\$5.00/lb price range may be selling a variety that is in one respect discernibly different in appearance from tomatoes that are priced between \$2.00-\$3.00/lb, while a quality like taste is embedded and unknown to those who have yet to try the higher priced variety. Additionally, different varieties may have different growing requirements, effecting production costs and subsequently affecting the price at farmers' markets. On the other hand, tomatoes at grocery stores are generally homogenous across grocery stores, and one rarely comes across heirloom varieties, if at all. This point is raised because there may be growers who are rightfully pricing tomatoes at the higher price range, and would be wisely reluctant to reduce their price. Contrast these points, however, with the fact that organic tomatoes at farmers' markets are comparatively low priced in relation to their grocery store and co-op counterparts. Additionally, at farmers' markets a consumer can, with regularity, purchase organic tomatoes for \$3.00/lb, while rarely even having the opportunity to purchase organic tomatoes at the grocery store. For conventional tomatoes at farmers' markets producers could reasonably target \$2.00-\$3.00/lb price range. For organic tomatoes at farmers' markets, a price range of \$3.00-\$3.50/lb could reasonably be targeted. In many cases, producers at farmers' markets are already selling within these price ranges.

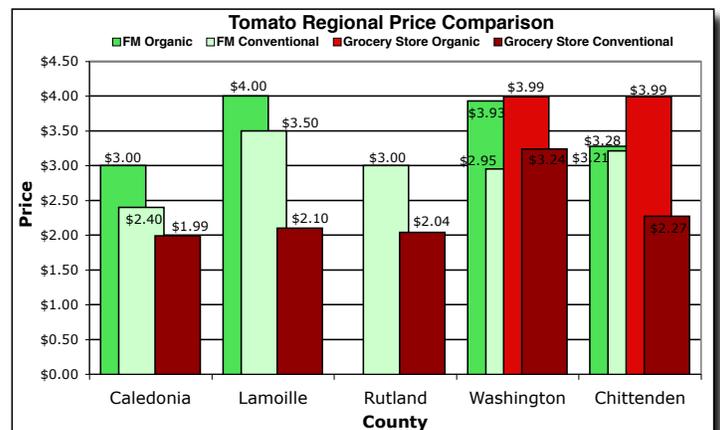


Figure 32

Discussion and Recommendations

Overview

The findings of this study have shown that prices at farmers' markets are in many cases competitive with prices at grocery stores. The in-depth analysis illuminates the price competitiveness of conventional items at farmers' markets. 3 of the 9 observed mean price differences where conventional items at grocery stores were less than conventional items at farmers' markets (33%) were not statistically significant differences (green peppers, head lettuce, and string beans). The observed mean difference for these items was primarily the result of greater price variability at farmers' markets than at grocery stores.

Furthermore, 2 of the remaining 6 items (33%), blueberries and corn, where observed and statistically significant differences existed, had mode values that were the same for farmers' markets and grocery stores. The median value for corn was essentially equal at farmers' markets and grocery stores, while the median value for blueberries was \$1.00 less at grocery stores than it was at farmers' markets. We revealed that in the case of corn, grocery stores offered a greater number of discounted dozen and half dozen prices than at farmers' markets, and this largely explains the observed mean difference in price between conventional corn at grocery stores and conventional corn at farmers' markets. With blueberries, the mean and median differences were primarily the result of a greater percentage of prices at farmers' markets occurring between the \$4.00-\$5.00 price range. Out of the 4 remaining conventional items that had statistically significant differences, 3 were not unexpected (eggs, potatoes, and tomatoes), while the difference for the remaining item (squash) was largely influenced by early season variability. As previously discussed, the price differences for conventional eggs and potatoes in particular are likely being influenced by economies of scale that are not easily addressable endogenously by producers and market managers at farmers' markets.

Certified organic items at farmers' markets are clearly price competitive with organic items at grocery stores. Every organic item, aside from potatoes, was observed to be less at farmers' markets than at grocery stores. In some instances organic items at farmers' markets were even less than conventional items at grocery stores. Due to the affordability of organic items at farmers' markets, consumers who are interested in buying more organic food, but who also have budgetary constraints, should consider purchasing organic produce at farmers' markets as a viable alternative to purchasing organic, and, in some instances even conventional items at grocery stores. Not only will they encounter cheaper organic prices, but there is also a good chance that they will have a greater variety of organic produce available to choose from. Paradoxically, the abundance of organic options at farmers' markets may be fueling the perception, at least in Vermont, that prices at farmers' markets are much higher than they are at grocery stores. Remember that Grace et al. (2005) found that SNAP recipients had the perception that farmers' markets sold primarily organic items, and that they in turn perceived organic to be more expensive in general. It is plausible that consumers are constructing their perceptions of organic prices at farmers' markets based upon their encounters with organic prices at grocery stores. In response, farmers' markets in Vermont could more deliberately emphasize the strength of their organic offerings, conveying to consumers that not only are organic prices affordable at farmers' markets, but the value received for the price is comparatively high i.e. consumers are receiving, at a reasonable price, a healthy, locally, and sustainably grown product.

Keep in mind as well that of those producers who were designated as conventional, 57% identified their practices as organic. We can surmise that from a marketing standpoint many producers at farmers' markets see value in organic production, and perhaps at a personal level treat organic production as the production standard to emulate. As it relates to consumers, the existing price differences for conventional items may be acceptable to consumers who value more environmentally benign practices, but also trust farmers' claims that their practices are organic sans certification.

Closing the Gap: EBT users and Farmers' Market Prices

The issue going forward is determining the significance of the existing price differences, especially as they relate to lower income individuals. For many, and especially for those already shopping at farmers' markets, the differences may be generally acceptable. However, if lower income individuals still find the price differences prohibitive, can farmers' market stakeholders address price differences with alternative pricing strategies? A broader philosophical question facing stakeholders is, is it the role of producers and market managers to address issues of inequality, and if so, how can the issue of access be addressed without sacrificing the livelihood of producers? Can local producers, in other words, continue to receive price premiums for particular items, yet improve access for lower income individuals without substantially hurting the bottom line? The next section will begin to elucidate on these questions by examining the concept of consumers willingness to pay.

Many studies have shown that consumers are willing to pay a premium for locally produced food. The premium percentage, however, varies from study to study, and is sensitive, but not limited to, income and educational levels. Adams & Adams (2008) Carpio & Massa (2008) and Darby et al. (2006) have all confirmed to different degrees the notion that current and active farmers' market patrons apply a premium value to local foods. Corum et al. (2001), in their book *The New Farmers' Market: Farm-Fresh Ideas for Producers, Managers & Communities*, are saliently aware of this fact and strongly suggest that producers at farmers' markets price their items to maximize the premium value that farmers' market patrons place upon fresh and local food. Examining willingness to pay, however, only in the context of those who already shop at the market ignores a large consumer base that may not apply the same price premiums to local goods. Examining the willingness to pay of other consumer groups will help producers at farmers' markets understand more clearly how price premium levels may be effecting overall turnout at farmers' markets. Thus, before the discussion goes any further, it is helpful to examine what is known about the price sensitivity of non-farmers' market consumers.

Darby et al. (2006) directly compared the price sensitivity of farmers' market shoppers and grocery store shoppers. They discovered that grocery store shoppers were more sensitive to changes in price than any other product attribute, such as local or freshness, while in contrast change in price ranks third, behind local and freshness, for farmers' market shoppers. Additionally, Wang and Sun (2003) found that consumers who had not purchased organic food placed the highest preference on price over any other product attribute. Due to the lack of organic options at grocery stores, we can infer that the surveyed consumers who had not purchased organic food in the Wang and Sun (2003) study were likely grocery store shoppers. These findings are important because other studies, like the one conducted by Adams & Adams (2008), have limited their analysis of willingness to pay for local foods on existing farmers' market patrons, often confirming already held assumptions while providing little insight as to why non-farmers' market participants do not choose to shop at farmers' markets. The insight of Darby et al. (2006) and Wang and Sun (2003) is that price is clearly an important determining factor for grocery store shoppers, and one that is currently in distinct contrast with farmers' market patrons. Grocery store shoppers are much more sensitive to price premiums applied to locally grown food. Regardless of whether or not the perception of higher prices at farmers' markets is true, the average grocery store shopper is likely to react differently to price differences than the average farmers' market shopper. A 10% price difference can mean different things to different people, particularly if the price difference exists for a commonly purchased item. Ultimately, the average grocery store shopper's willingness to pay for local food is lower than the average farmers' market shopper.

Eliminating the general perception of higher prices, therefore, may not be sufficient in order to persuade grocery store shoppers to purchase items at the farmers' market even if marginal price differences exist between the majority of items. Because, though we have shown that prices are often competitive at farmers' markets, for certain items prices still may be too high—higher than the willingness to pay—to generate greater demand amongst low-income consumers who are especially price sensitive. For eggs and potatoes in particular, two common items that are cheap, familiar, and easy to cook, the price

differences are potentially preventing people from going to farmers' markets and purchasing other, cheaper, items. If the price of a few items on the average grocery shopper's list exceeds their willingness to pay for them, then the likelihood of purchasing other items that are within their willingness to pay diminishes. In other words, why purchase cheap lettuce if the potatoes are expensive?

Moreover, producers at farmers markets cannot arbitrarily lower their prices for eggs and potatoes—or any other item for that matter—in order to compete with conventional grocery store prices for eggs and potatoes, and expect to be profitable. Prices at farmers' markets are, of course, not only a reflection of consumers' willingness to pay for them but also a reflection of a producer's tangible production and marketing costs that are not typically subject to immediate and drastic changes. How then, can producers at markets maintain appropriate price premiums and base prices for their locally grown items, but reach out to low income groups, and EBT users in particular, who are especially sensitive to price?

As it was suggested in the item-by-item analysis, the use of stratified pricing for select items can provide incentives for lower income individuals to purchase food at farmers' markets, and potentially, even increase profits for producers. In economic literature, such a pricing system is known as price discrimination. Despite its unfortunate pejorative association, price discrimination, or discriminatory pricing is actually quite common. Price discrimination involves selling the same good, at different prices, to different segments of a market. Producers, in this way, can sell goods to people who normally wouldn't purchase the good at its normal price, while still selling the good at its normal price to the existing consumer base. Coupons, for instance, are an example of discriminatory pricing targeted at lower income individuals who, because they are price sensitive, are more likely to take the time to search for coupons in newspaper inserts and direct mail catalogues. Grace et al. (2005) found that 49% of SNAP recipients surveyed based the majority of their grocery purchases on items that either had a coupon or in-store special available. A local example of price discrimination, related to the issue of food access, is City Markets "Food-for-All" membership benefit program. Under the program, qualified participants automatically receive a 10% discount on food purchases. The program currently has 1,148 participants, constituting approximately 20% of the co-ops membership.

Conceptually, for price discrimination to be successful different groups of consumers must have different price sensitivities or price elasticity of demand¹, these groups must be clearly identifiable by producers, opportunities for arbitrage must be minimal, and consumers must find the discriminatory pricing socially acceptable. Consumers who don't find the price discrimination justified are likely to either demand an equivalent price for all or remove themselves from the market. For these reasons, price discrimination is well suited for food related markets in general, and for farmers' markets in particular. EBT users at farmers' markets receive \$1.00 tokens as a currency to make purchases at the farmers' market, which would make it easy for producers to identify those who could purchase at a discounted price between those who could not purchase at a discounted price. Because coupons are already so widely used at other food outlets, the idea of introducing such a system to farmers' markets would likely be viewed as an equitable measure to increase the participation of low-income individuals at farmers' markets. In fact, such a system already exists to some degree at farmers' markets. The Wholesome Wave Foundation's Double Value Coupon Program doubles the value of SNAP benefits utilized at farmers' markets. Program funding, however, is not guaranteed year to year, only matches up to \$10 worth of SNAP benefits per person, and is distributed on a first come first serve basis at markets.

Instituting price discrimination at farmers' markets does not necessarily have to be implemented by reducing prices product to product. Products can be bundled together; in such a way that the

¹ Price elasticity of demand measures how demand for a good or service changes with the change of price for that good or service, expressed as % change in quantity demanded / %change in price ($\frac{\% \Delta Q}{\% \Delta P}$). A ratio less than one means that demand is relatively inelastic, meaning that changes in price have small effects on levels of demand. Whereas, a ratio greater than one signifies that demand is elastic, such that changes in price have significant effects on levels of demand. In the case of EBT users, they likely have an elastic demand for food items, though because food is a necessity it tends to have a more inelastic demand than other goods and services.

aggregated price for the bundle is less than it would be if a customer were to purchase each item separately. The product mix for a bundle could include, for example, staple items like eggs and potatoes at a reduced rate along with mixed greens and cucumbers at their regular price. Bundling items is also well suited for the provision of recipes or cooking tips, because a bundle can essentially provide the primary ingredients for a particular recipe. Bundling and the inclusion of recipes certainly requires further devotion to marketing, the cost of which tends to be higher for producers at farmers markets (Hardesty and Leff, 2009)². However, the opportunity costs associated with devising bundles and writing recipes could actually be spread across producers at the markets—facilitated by the market manager—and assisted by supporting agencies and institutions. NOFA-VT, for example, already hosts a direct marketing conference and runs workshops designed to improve local producers’ marketing and overall business strategies. Nonetheless, one thing that comes through clearly from the Oregon Food Bank study is that lower income groups actively search for bargains and deals, and they are currently not finding them at farmers’ markets.

Balancing incentives at the market level and at a larger institutional level may prove to be critical, such that programs like Wholesome Wave’s Double Value program are paired with discriminatory pricing systems, particularly discounted item bundles, that are initiated by producers themselves. If programs like Wholesome Wave’s Double Value program were to secure long-term funding that was accessible at all markets throughout the market season, then the burden would obviously be lessened for producers to implement discriminatory pricing at farmers’ markets. However, relying on additional long-term funding in the current economic and political environment may not be feasible, and market based price discrimination approaches instituted as policy of farmers’ markets themselves may prove to be more efficient in the long run. The arrangement of the Wholesome Wave program, however, is desirable for producers because they still receive the full amount on purchases. This point brings forth the final part of the discussion.

In order for price discrimination to work at farmers’ markets, it ultimately must make financial sense for producers to implement discriminatory pricing. If producers are currently satisfied with sales and leaving the market with little to no produce leftover, then discriminatory prices may affect revenue negatively, and the idea will understandably be undesirable. However, if producers have even a small surplus of supply left over upon leaving the market, discriminatory pricing—by increasing demand and consequently sales—may actually increase revenue by capturing sales that otherwise would not have occurred. Under certain scenarios, an increase in discounted transactions can even offset a decrease in full price transactions. Producers may be wary of instituting discriminatory pricing, but with more thorough accounting of total sales, revenue, remaining supply, and production costs, it can be demonstrated to producers that such a policy can be to their benefit. Lastly, each farmers’ market is unique, so the decision to initiate a price discrimination policy would have to occur at a market-to-market level, though larger markets that have more producers and similar levels of competition amongst producers may be able to pilot the policy in concert with one another.

As it stands, EBT users and other low income groups looking for affordable prices will find that prices at farmers’ markets are at their lowest starting around July 23rd and continuing on into early September. At the market, low income groups will find that cucumbers, cut leaf lettuce, green peppers, head lettuce, snow peas and string beans are all affordably priced in comparison with grocery store prices. In the middle of August, squash in particular, becomes more affordable and price competitive with grocery stores. Because our study is not an exhaustive comparison of every item one might find at a farmers’ markets, it is reasonable to think that there are additional price competitive products at farmers’ markets that EBT users will find once they start shopping more regularly at farmers’ markets.

² Hardesty and Leff showed that especially when pre-opening marketing activities are calculated, sellers at farmers’ markets incur a higher percent cost of revenue from these activities than producers selling through CSAs or wholesale channels.

Conclusions

The price comparison study has shown that price differences between farmers' markets and grocery stores have been to a large extent exaggerated, and that farmers' markets are an especially affordable alternative for consumers who either currently purchase organic food or who have expressed an interest in buying organic food but are restricted due to high organic prices at grocery stores. Because organic food is often associated with higher prices, farmers' markets should make a concerted effort to distinguish their organic prices from those at grocery stores, emphasizing that local and local organic food are not mutually exclusive with regards to affordability. Essentially, farmers' markets in Vermont have a marketing opportunity in which they can establish an identity that distinguishes them from other grocery outlets. The farmers' market is a place where consumers will find healthy, affordable, environmentally conscious, and locally grown food.

As variance in price is reduced at farmers' markets, consumers of all income levels can expect more consistent prices from vendor to vendor and market to market. Producers may find the pricing information helpful for common varieties, but should be cautious when applying the price recommendations to specialty varieties. However, we have gone to great lengths to assure that the price comparisons being made are for common varieties, and therefore reliable indicators of price for those items. Producers who find this report helpful should consider reporting their prices to UVM Extensions recent online price reporting system in order to construct more comprehensive and reliable year-to-year pricing data for a greater variety of items. The UVM pricing system is a tool that has the potential to help producers stabilize prices, minimizing much of the price variance that was observed in this study. The system to date is under utilized, yet through the course of this study, many producers asked about where they could find the pricing system or expressed an interest in reporting their prices to the system. Hopefully this report can raise the profile of the UVM pricing system and increase participation. For those who are interested, the online price reporting system can be found at http://www.uvm.edu/newfarmer/?Page=marketing/price_survey.html&SM=marketing/sub-menu.html.

In light of our findings, the idea that producers at farmers' markets must make a trade off between price and viability should, at the very least, be reexamined. Local producers continue to become more sophisticated and efficient in their operations, and it is reasonable to think that prices will continue to stabilize, reaching an equilibrium point that is simultaneously sustainable for producers and consistently affordable for consumers

There is still uncertainty as to how pricing decisions are made in general at farmers' markets, and how closely they reflect production costs. Personal encounters during the study revealed that on more than one occasion one producer would match their prices to the prices of other producers at the market prior to opening, without much consideration for how the change in price reflected their own operational costs. Consequently, of interest is determining whether or not this affects producers with different production costs, how this affects organic producers who match prices with conventional producers in particular, and even determining who is actually setting the initial price prior to opening. Additionally, further examination of alternative pricing strategies for EBT users needs to be undertaken, and could play an important role in improving EBT users long-term access to farmers' markets. An immediate intermediary measure that can be utilized more often at farmers' markets is the provision of recipes and cooking tips for affordable items. Familiarity with how to use the item being purchased is often just as important as familiarity with the price of the item being purchased. Consequently, additional consideration should be given to determining if marketing responsibilities related to recipes and food preparation should be undertaken by producers, market managers, supporting institutions, or a synergy of the three.

Farmers' markets still face many other challenges beyond those directly associated with price, such as finding suitable long-term locations and dealing with limited operation hours. However, the findings of this study have hopefully put the debate over price into a more realistic perspective and will help inform decision-making regarding other but related challenges facing farmers' markets today.

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