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Comparing Farm Financial Performance Across Local Foods Market Channels

Todd M. Schmit
Cornell University

Becca B.R. Jablonski
Colorado State University

Chris Laughton

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Comparing Farm Financial Performance Across Local Foods Market Channels

Abstract

Financial performance benchmarks were estimated on the basis of samples of successful Northeast fruit and vegetable producers classified by primary local foods market channel. Comparisons across farm stores, large urban farmers' markets, and intermediated market channels were conducted for the purpose of identifying key differences in human and financial resource requirements. The benchmarks provide data useful for assisting individual farmers in assessing their performances and new and beginning farmers in identifying appropriate market channels for their businesses. Additionally, the benchmarks provide a rich source of information for use by Extension educators in developing programming around local foods marketing opportunities and business planning.

Keywords: [local foods](#), [direct markets](#), [intermediated markets](#), [Greenmarket](#), [financial benchmarks](#)

Todd M. Schmit
Associate Professor
Cornell University
Ithaca, New York
tms1@cornell.edu

Becca B. R. Jablonski
Assistant Professor
Colorado State
University
Fort Collins, Colorado
becca.jablonski@colostate.edu

Chris Laughton
Director of Knowledge
Exchange
Farm Credit East, ACA
Enfield, Connecticut
christoper.laughton@farmcrediteast.com

Introduction

Local food sales totaled \$9 billion in 2015, with 167,009 farmers using local foods market channels in the United States (U.S. Department of Agriculture, 2016). Local food systems are an area of growth in programming by Extension educators, including regarding efforts to estimate the economic impacts of food system initiatives (Jablonski, O'Hara, Thilmany McFadden, & Tropp, 2016). Further, eXtension's Community, Local, and Regional Food Systems Community of Practice was established several years ago and now includes over 400 members (eXtension, n.d.). As emphasis on local food markets continues, farmers need access to financial information that can support more informed market channel selection.

Constructing financial benchmarks allows for comparative analysis by farmers relative to best practices performed by a sample of their peers. Such benchmarks also provide a rich source of information Extension educators can use in developing programming around local marketing opportunities. A comparison across market channels highlights areas of differential requirements for human and financial resources where farmers are able to use information to adjust operations and improve financial performance.

The U.S. Department of Agriculture and land-grant universities have long collected data to improve farm performance through benchmarking. However, information is almost exclusively available by commodity and rarely by market channel (Matteson & Hunt, 2012). There is growing evidence that farms selling through local food markets require different business models with different resource requirements (Jablonski & Schmit, 2016; Schmit, Jablonski, & Mansury, 2016). Therefore, traditional financial benchmarks are not adequate bases for providing meaningful planning advice. In addition, producers often face challenges in fully understanding the purchasing practices of wholesale buyers (Gregoire, Arendt, & Strohbehn, 2005), and accessing intermediated market channels is increasingly difficult as food supply chains become more differentiated (King et al., 2010, Knight & Chopra, 2013).

Use of intermediated market channels (e.g., distributors, restaurants, grocery stores, institutions) typically allows producers to move large quantities of produce quickly but usually at a relatively lower price (Hardesty & Leff, 2010; LeRoux, Schmit, Roth, & Streeter, 2010). Direct market channels (e.g., farmers' markets, farm stores, community-supported agriculture) often feature higher prices but require more time committed to customer interaction and marketing. Consequently, producers are faced with the decision of whether to move larger volumes of products through intermediaries at relatively lower prices or seek higher prices in direct market channels and run the risk of selling in lower volumes or having unsold leftovers. These distinctions often vary on the basis of market attributes such as population density or competition at particular markets.

The purpose of this research brief is to provide farm financial performance benchmarks based on data from selected samples of northeastern U.S. local foods producers classified by primary market channel. This information will be of use to Extension educators seeking support to inform programming on how participation in different market channels affects farm viability and what makes certain markets more successful than others.

Research Method

In constructing the benchmarks, we used two sources of information. The first source of information was records from a sample of fruit and vegetable producers selling directly to consumers through one or more Greenmarket farmers' markets in New York City (GrowNYC, n.d.). We divided the sample of farms into two subsamples. The first, the Primary Greenmarket sample, included farms that had a majority of sales (over 50%) from Greenmarket ($N = 19$). The second, the Other Greenmarket sample, included farms that had less than or equal to 50% of farm sales from Greenmarket ($N = 13$).

The second source of information was records from a sample of fruit and vegetable producers who were members of Farm Credit East (FCE), a farm financial services cooperative. We divided the sample of farms into two subsamples. The first, the Ag Retail sample, included farms for which a majority of sales (over 50%) were to consumers through their own retail farm stands/stores ($N = 15$). The second, the Wholesale Vegetable sample, included farms that sold exclusively through intermediated market channels ($N = 20$). No farms included in the FCE samples participated in Greenmarket.

For each sample, we calculated average sales, expenses, and margins per acre following categories used by FCE. We conducted means difference tests across samples to analyze statistical differences. This procedure involved computing differences between means and calculating a significance value using the *t*-test. The *p* value is the probability of obtaining the observed differences between the samples if the null hypothesis were true. The null hypothesis was that the difference in means is zero, with $N_1 + N_2 - 2$ degrees of freedom.

Statistical significance was defined as p values less than .100.

Results and Discussion

We first compared the two Greenmarket samples (Primary and Other) and then compared the two FCE samples (Ag Retail and Wholesale Vegetable). Finally, we compared the Primary Greenmarket sample and the Ag Retail sample.

Primary Greenmarket Versus Other Greenmarket

We compared the two Greenmarket samples to assess differences based on farm reliance on Greenmarket sales. The benchmarks and statistical tests are displayed in Table 1. Note that the average percentages of sales from Greenmarket were 84% and 22% for the Primary and Other samples, respectively.

Table 1.

Farm Sales, Expenses, and Margins per Acre, Primary Greenmarket Farms and Other Greenmarket Farms

| Category | Primary Greenmarket | | Other Greenmarket | | Difference ^a | | t | p |
|--------------------------------|---------------------|--------|-------------------|--------|-------------------------|-------|--------|-------|
| | M | SD | M | SD | M | SE | | |
| Total sales | 15,388 | 11,811 | 15,012 | 10,524 | 377 | 4,072 | 0.092 | 0.927 |
| Variable expenses: | | | | | | | | |
| Hired labor | 4,098 | 4,436 | 5,577 | 5,068 | -1,479 | 1,691 | -0.874 | 0.389 |
| Fertilizer and lime | 383 | 840 | 330 | 395 | 53 | 251 | 0.213 | 0.833 |
| Chemicals and pest control | 119 | 392 | 131 | 266 | -11 | 125 | -0.090 | 0.929 |
| Fuel | 1,025 | 1,423 | 500 | 513 | 524 | 414 | 1.267 | 0.215 |
| Seeds and plants | 1,046 | 1,927 | 957 | 1,522 | 88 | 639 | 0.138 | 0.891 |
| Freight and trucking | 483 | 813 | 408 | 598 | 75 | 264 | 0.285 | 0.778 |
| Inventory purchased for resale | 0 | 0 | 0 | 0 | 0 | — | — | — |
| Total variable expenses | 7,154 | 6,337 | 7,903 | 6,087 | -749 | 2,245 | -0.334 | 0.741 |
| Gross margin | 8,235 | 7,004 | 7,109 | 5,812 | 1,126 | 2,359 | 0.477 | 0.637 |
| Fixed expenses: | | | | | | | | |
| Taxes | 640 | 838 | 201 | 338 | 438 | 246 | 1.783 | 0.085 |
| Insurance | 360 | 394 | 447 | 503 | -88 | 159 | -0.551 | 0.586 |
| Rent and lease | 1,170 | 2,581 | 567 | 797 | 603 | 742 | 0.813 | 0.423 |
| Repairs and maintenance | 1,710 | 3,615 | 1,674 | 2,457 | 36 | 1,153 | 0.031 | 0.975 |
| Utilities | 295 | 440 | 229 | 312 | 66 | 142 | 0.466 | 0.645 |
| Interest | 57 | 196 | 200 | 363 | -143 | 99 | -1.438 | 0.161 |
| Other | 1,154 | 1,284 | 1,225 | 1,493 | -71 | 494 | -0.145 | 0.886 |
| Total fixed expenses | 5,385 | 6,827 | 4,544 | 3,696 | 842 | 2,081 | 0.405 | 0.689 |

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|-------------------|---|--------|--------|-------|-----|-------|-----------|-------|
| Total expenses | 12,539 | 10,830 | 12,446 | 9,184 | 93 | 3,673 | 0.025 | 0.980 |
| Net margin | 2,849 | 4,087 | 2,566 | 3,875 | 284 | 1,441 | 0.197 | 0.845 |

Note: Primary Greenmarket farms had more than 50% of their total sales through Greenmarket ($N_1 = 19$). Other Greenmarket farms had less than or equal to 50% of their total sales through Greenmarket ($N_2 = 13$). The average percentages of sales from Greenmarket were 84% and 22%, respectively.

^aDifference equals the difference in observed means, where p is the probability of obtaining the observed difference if the null hypothesis that the difference is zero were true, with $N_1 + N_2 - 2$ degrees of freedom.

Average farm sales per acre were not statistically significantly different across the samples ($p = .927$). Similarly, we found that all of the aggregated expense (variable, fixed, total) and margin values (gross, net) were not statistically significantly different. Total expenses per acre were around \$12,500, leaving a net margin per acre of around \$2,500. The only statistically significant difference was for taxes per acre ($p = .085$), where Primary Greenmarket farms averaged \$640 and Other Greenmarket farms averaged \$201. This circumstance is likely due to geographic differences, particularly if Primary Greenmarket farms are located closer to New York City, where property tax rates are higher. The similarity in financial benchmarks may be due to a relatively large reliance on farmers' markets overall by the producers in both samples, whether Greenmarket farmers' markets or otherwise.

Ag Retail Versus Wholesale Vegetable

We compared financial parameters across the FCE samples to highlight differences between a direct (Ag Retail) and an intermediated (Wholesale Vegetable) market channel strategy. Note that the direct market channel is specific to a farm stand/store, whereas the intermediated channel is general. The financial benchmarks and statistical tests are displayed in Table 2.

Table 2.

Farm Sales, Expenses, and Margins per Acre, FCE Ag Retail Farms and FCE Wholesale Vegetable Farms

| Category | FCE Ag Retail | | FCE Wholesale Vegetable | | Difference ^a | | <i>t</i> | <i>p</i> |
|----------------------------|---------------|-----------|-------------------------|-----------|-------------------------|-----------|----------|----------|
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SE</i> | | |
| Total sales | 24,326 | 16,318 | 8,089 | 6,715 | 16,237 | 4,026 | 4.033 | 0.000 |
| Variable expenses: | | | | | | | | |
| Hired labor | 6,791 | 5,472 | 2,485 | 2,192 | 4,306 | 3,933 | 3.205 | 0.003 |
| Fertilizer and lime | 206 | 284 | 474 | 498 | -268 | 421 | -1.864 | 0.071 |
| Chemicals and pest control | 259 | 297 | 235 | 340 | 23 | 323 | 0.213 | 0.833 |
| Fuel | 353 | 337 | 212 | 170 | 141 | 255 | 1.626 | 0.113 |
| Seeds and plants | 450 | 440 | 575 | 667 | -125 | 582 | -0.631 | 0.533 |
| Freight and trucking | 185 | 535 | 85 | 179 | 100 | 374 | 0.783 | 0.439 |

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|--------------------------------|---|-------|-------|-------|--------|-------|-----------|-------|
| Inventory purchased for resale | 5,954 | 6,277 | 366 | 876 | 5,588 | 4,142 | 3.950 | 0.000 |
| Total variable expenses | 14,198 | 8,372 | 4,433 | 2,539 | 9,766 | 5,783 | 4.944 | 0.000 |
| Gross margin | 10,128 | 4,736 | 3,656 | 1,605 | 6,472 | 3,316 | 5.713 | 0.000 |
| Fixed expenses: | | | | | | | | |
| Taxes | 402 | 235 | 148 | 170 | 254 | 200 | 3.720 | 0.001 |
| Insurance | 597 | 586 | 185 | 144 | 412 | 397 | 3.041 | 0.005 |
| Rent and lease | 661 | 737 | 283 | 355 | 378 | 551 | 2.011 | 0.053 |
| Repairs and maintenance | 790 | 572 | 353 | 265 | 437 | 423 | 3.020 | 0.005 |
| Utilities | 350 | 585 | 191 | 304 | 159 | 445 | 1.045 | 0.304 |
| Interest | 374 | 436 | 128 | 198 | 246 | 321 | 2.242 | 0.032 |
| Other | 2,988 | 1,712 | 1,703 | 1,569 | 1,285 | 1,631 | 2.307 | 0.027 |
| Total fixed expenses | 6,163 | 2,176 | 2,991 | 1,685 | 3,172 | 1,909 | 4.865 | 0.000 |
| Total expenses | 20,361 | 8,650 | 7,424 | 3,047 | 12,937 | 6,090 | 6.219 | 0.000 |
| Net margin | 3,965 | 4,130 | 665 | 1,649 | 3,300 | 2,967 | 3.256 | 0.003 |

Note: FCE = Farm Credit East. FCE Ag Retail farms were defined as fruit and vegetable farms with a majority of sales (more than 50%) from their own farm stand or store ($N_1 = 15$), a direct market channel. FCE Wholesale Vegetable farms were defined as vegetable farms with sales through only intermediated market channels ($N_2 = 20$).

^aDifference = difference in observed means, where p is the probability of obtaining the observed differences if the null hypothesis that the difference is zero were true, with $N_1 + N_2 - 2$ degrees of freedom.

Average sales per acre were considerably higher for the Ag Retail sample than for the Wholesale Vegetable sample (\$24,326 versus \$8,089, respectively, $p < .001$), as expected from a higher retail price point. However, the size of the difference was striking. This circumstance is due to the fact that the Ag Retail farmers also purchased product from other farms for resale. Accordingly, the total sales per acre included sales of produce purchased from other farms but not reflected in the farms' acres.

The difference in inventory purchased for resale (\$5,588, $p < .001$) was the largest contributor to higher total variable expenses per acre for the Ag Retail farms (\$9,766, $p < .001$), followed closely by hired labor costs (\$4,306, $p = .003$). The former highlights the need for a farmer managing an own-farm store to have available sufficient quantities and varieties of produce to maintain customer traffic when particular products may not be available from his or her own farm. The latter result is consistent with higher marketing labor costs in direct markets more generally, but specifically here when considering wages for sales staff in the farm stores. The only other variable expense that was statistically significantly different across the samples was for fertilizer and lime, where the Ag Retail sample was less than the Wholesale Vegetable sample by \$268 ($p = .071$), perhaps a reflection of agronomic requirements by location and/or direct-market-channel consumer preferences for organic or similar production methods.

Fixed expenses per acre were considerably higher for the Ag Retail sample for every category except utilities. In total, fixed expenses per acre were \$3,172 higher for the Ag Retail sample ($p < .001$). This finding is

consistent with added infrastructure investments and maintenance associated with farm store operations.

Even though total expenses per acre were nearly \$13,000 higher, on average, for the Ag Retail sample ($p < .001$), higher retail sales more than offset any scale economies associated with the larger producers in the Wholesale Vegetable sample (on average, the Wholesale Vegetable farmers managed about twice as many acres). In short, the successful procurement of other produce for resale, along with the higher retail price point and well-managed costs, boosted farm profitability. Accordingly, the average net margin per acre for the Ag Retail sample was \$3,300 above that for the Wholesale Vegetable sample ($p < .001$). It is important to point out, however, that the net margin represents a return to operator labor and management. Research has shown that when the value of this labor is accounted for, considerable decreases in net returns exist (LeRoux et al., 2010).

Primary Greenmarket Versus Ag Retail

Comparing data from the Primary Greenmarket sample of farmers who primarily sold through Greenmarket and the Ag Retail sample of farmers primarily engaged in farm stands or stores provides a more nuanced perspective on financial benchmarks for direct market channels. The full financial comparison is shown in Table 3.

Table 3.

Farm Sales, Expenses, and Margins per Acre, Primary Greenmarket Farms and FCE Ag Retail Farms

| Category | Primary Greenmarket | | FCE Ag Retail | | Difference ^a | | <i>t</i> | <i>p</i> |
|--------------------------------|---------------------|-----------|---------------|-----------|-------------------------|-----------|----------|----------|
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SE</i> | | |
| Total sales | 15,388 | 11,811 | 24,326 | 16,318 | -8,938 | 4,823 | -1.853 | 0.073 |
| Variable expenses: | | | | | | | | |
| Hired labor | 4,098 | 4,436 | 6,791 | 5,472 | -2,693 | 1,698 | -1.586 | 0.123 |
| Fertilizer and lime | 383 | 840 | 206 | 284 | 177 | 227 | 0.778 | 0.442 |
| Chemicals and pest control | 119 | 392 | 259 | 297 | -139 | 122 | -1.140 | 0.263 |
| Fuel | 1,025 | 1,423 | 353 | 337 | 672 | 377 | 1.783 | 0.084 |
| Seeds and plants | 1,046 | 1,927 | 450 | 440 | 596 | 509 | 1.170 | 0.250 |
| Freight and trucking | 483 | 813 | 185 | 535 | 298 | 244 | 1.225 | 0.230 |
| Inventory purchased for resale | 0 | 0 | 5,954 | 6,277 | -5,954 | 1,434 | -4.152 | 0.000 |
| Total variable expenses | 7,154 | 6,337 | 14,198 | 8,372 | -7,044 | 2,521 | -2.795 | 0.009 |
| Gross margin | 8,235 | 7,004 | 10,128 | 4,736 | -1,893 | 2,112 | -0.896 | 0.377 |
| Fixed expenses: | | | | | | | | |
| Taxes | 640 | 838 | 402 | 235 | 238 | 224 | 1.064 | 0.295 |
| Insurance | 360 | 394 | 597 | 586 | -237 | 168 | -1.408 | 0.169 |
| Rent and lease | 1,170 | 2,581 | 661 | 737 | 509 | 690 | 0.738 | 0.466 |
| Repairs and maintenance | 1,710 | 3,615 | 790 | 572 | 920 | 945 | 0.973 | 0.338 |

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|----------------------|---|--------|--------|-------|--------|-------|-----------|-------|
| Utilities | 295 | 440 | 350 | 585 | -55 | 176 | -0.313 | 0.756 |
| Interest | 57 | 196 | 374 | 436 | -317 | 112 | -2.835 | 0.008 |
| Other | 1,154 | 1,284 | 2,988 | 1,712 | -1,835 | 513 | -3.573 | 0.001 |
| Total fixed expenses | 5,385 | 6,827 | 6,163 | 2,176 | -777 | 1,837 | -0.423 | 0.675 |
| Total expenses | 12,539 | 10,830 | 20,361 | 8,650 | -7,822 | 3,432 | -2.279 | 0.029 |
| Net margin | 2,849 | 4,087 | 3,965 | 4,130 | -1,116 | 1,418 | -0.787 | 0.437 |

Note: FCE = Farm Credit East. FCE Ag Retail farms were defined as fruit and vegetable farms with a majority of sales (more than 50%) from their own farm stand or store ($N_1 = 15$), a direct market channel. Primary Greenmarket farms had more than 50% of their total sales through Greenmarket ($N_1 = 19$). The average percentage of sales from Greenmarket for Primary Greenmarket farms was 84%. No farms included in the FCE Ag Retail sample participated in Greenmarket.

^aDifference = difference in observed means, where p is the probability of obtaining the observed differences if the null hypothesis that the difference is zero were true, with $N_1 + N_2 - 2$ degrees of freedom.

In this case, the relatively strong sales performance among the Ag Retail farms exceeded that of the Primary Greenmarket farms by nearly \$9,000 per acre ($p = .073$), but with net margins that were ultimately not statistically significantly different. The main difference between these two groups of producers lies in the use of produce purchased from other producers. Ag Retail farmers purchase a sizable amount of produce from other farmers for resale; however, Greenmarket vendors are allowed to sell only produce that originates from their own farms.

Primary Greenmarket farms had average fuel costs per acre that were \$672 higher than farms in the Ag Retail sample ($p = .084$), likely attributable to higher transportation costs associated with travel to a more distant and large urban market. Indeed, in a related project with these Greenmarket producers, the costs for fuel and tolls were often mentioned as the major costs after labor. After all variable expenses were accounted for, we computed a gross margin that was not statistically significantly different across these two samples ($p = .377$).

Fixed expenses per acre were generally similar across the two samples and not statistically significantly different in aggregate. However, Primary Greenmarket producers were less leveraged, by \$317 per acre ($p = .008$), and had lower other (miscellaneous) expenses by \$1,835 ($p = .001$). Also, total expenses (variable plus fixed) were lower for the Primary Greenmarket sample by \$7,822 ($p = .029$) and generally similar in magnitude to the lower sales per acre, resulting in net margins between the two samples that are not statistically significantly different. In short, the relatively higher retail price point at Greenmarket offsets the sales gains by Ag Retail farmers selling produce procured from other farmers.

Conclusions

We computed financial benchmarks based on separate samples of successful fruit and vegetable producers in the northeastern United States and differentiated them by their participation in various direct and intermediated market channels. These kinds of financial benchmarks can effectively be used by new and beginning farmers to better inform business planning decisions and market channel selection. They also can be used by existing farmers participating in similar channels to assess their own financial performance.

Because benchmarks by market channel traditionally have not been available, the results presented here will be useful to agricultural Extension educators developing educational curricula. Additionally, and in particular, the content herein serves as an explanation of how such benchmarks can be constructed with educators' own locally available data for improved application.

Due to their defined geographic orientation, benchmarks for local foods market channels are more sensitive to local market characteristics and population demographics than those with traditional commodity orientations. Accordingly, the results presented here may not be representative of other spatially defined market areas. In addition, our small sample sizes reduce the robustness of our results, but the results do provide empirical support for the financial implications of known operational and human resource requirement differences across channels. More research is needed to develop market channel benchmarks based on larger sample sizes and a variety of market conditions.

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