



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

*No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.*

# Examining Specialty Crop Price Relationships between Farmers Markets and Grocery Stores

Michael A. Gunderson and Ashley N. Earl

Farmers markets across the state of Florida have been increasing in popularity over the past two years. Very little information is available regarding the price relationship between farmers markets and nearby grocery stores. Further investigation of this relationship is necessary and could yield vital information to support further understanding of pricing trends among these two sources. By obtaining prices from both farmers markets and grocery stores that are closest to each of the markets, consumers will have tangible information regarding which of the two offers the lowest prices for produce. Farmers who participate in the markets will also have a better understanding of how to more competitively price their products and how much pricing affects consumer purchase decision making. Prices at farmers markets represent anywhere from a ten to a 50 percent discounted rate when compared to surrounding grocery stores. Although this trend has so far proven consistent, further research throughout the state of Florida is necessary to test the hypothesis. Many consumers are looking for cheaper alternatives from increasing grocery store prices. By increasing awareness of discounted—and often better quality—produce Florida consumers will enjoy savings on their grocery bill and will be more inclined to purchase produce at local farmers markets.

## Statement of Problem, Rationale and Justification

This project obtains price information from farmers markets and grocery stores in order to advise farmers who participate in markets to price their produce more competitively so that they may attract a broader customer base and ensure the prosperity of farmers markets. Objectives of this study include collecting tangible price relationship data, summarizing and analyzing pertinent trends/relationships among vendor responses and pricing, and distribut-

ing valuable information to farmers who participate in the markets.

## Problem Statement

What factors influence produce price differences that will lead to cost savings among farmers markets and grocery stores? How should vendors at the markets competitively price their produce? Testing price difference & vendor full-time status influence overall average percent cost savings:

$$H_0: \beta_n = 0 \quad H_a: \beta_n \neq 0$$

## Supporting Hypotheses

- Produce prices are lower at farmers markets when compared to grocery store prices for the same “basket” of produce.
- The price difference between the selected item of produce at a farmers market and its average price at surrounding grocery stores influences the consumer’s overall average percentage cost savings.
- Whether the vendor is full-time or part-time influences how they price their produce and therefore influences overall average percentage cost savings.

Testing the average grocery store price and average cost savings at a farmers market should influence how produce is priced at a farmers market.

$$H_0: \beta_n = 0 \quad H_a: \beta_n \neq 0$$

## Supporting Hypotheses

- Most farmers have no methodic way of pricing their produce.
- Grocery store prices should influence farmers market pricing.
- Potential savings should influence farmers market pricing.

Dong and Lin (2009) observe that “the proportion of lower income households’ food spending that goes to fruits and vegetables (17.9%) is about the same as that of someone in a higher income tax bracket (17.5%).” The actual dollar amount spent in that category—and thus the amount of the food consumed—is lower simply because less affluent people spend less on food overall. The USDA’s Economic Research Service found that “there were major income-related differences in the consumption of lettuce and lettuce-based salads, melons, berries, and other fruit” (Dong and Lin 2009). They also reported that women in the highest income group were twice as likely as women in the lowest income group to eat salad and fruit on a given day. The problem of providing enough fruits and vegetables across the country has always been and will always be an epidemic problem that needs to be approached in a serious manner. Raising awareness of the lower prices at farmers markets will not only support local farmers but it will ultimately incorporate more fruits and vegetables into the lives of consumers. Many patrons do not even realize the cost savings and benefit ratio of purchasing produce at a market. Grocery stores offer convenience and some quality assurance, but farmers markets provide less expensive produce and verbal quality assurance; the shopper will always know where the produce comes from and can be assured that vendors will not sell something they do not stand behind. Farmers markets “enable individual entrepreneurs and their families to contribute to the economic life of their local communities by providing goods and services that may not be readily available through formal mass markets. Thus, they embody what is unique and special about local communities and help to differentiate one community from another” (Lyson, Gillespie, and Hilchey 1995). With an economy approaching what would be deemed a national recession, the rising cost of groceries is inevitable. Now more than ever awareness of lower produce prices at markets is an immediate solution that will benefit the community and its consumers, and more importantly, ensure that farmers will have a consumer base to purchase their product.

By supporting local farmers at markets, we are enabling a prosperous and thriving agriculture future for those who are directly involved with the production, sales, and packaging of produce. There are no middlemen and there is low overhead; the

only thing that is missing from the equation is for the consumers to support the production of local produce. Farmers markets play a vital role in enabling farmers to gain direct access to customers. Without this access the existence of many small- and medium-sized growers would be threatened. The data obtained from this study will provide farmers with valuable information that will help them better price their products and attract a broader consumer base with published results from the study. Further advising and recommendations will be made per county for the vendors who participate in the markets.

The documented growth in farmers markets over the last decade (from 1,755 markets to 2,863 markets, an increase of 63 percent) indicates that customers are benefiting as well. Farmers markets provide customers with direct access to fresh fruits and vegetables as well as a variety of value-added products (Payne 2002). As humans we are self-seeking individuals, and the main way to catch our eye or to stimulate our interest is to offer something that will benefit us—whether it occurs immediately or throughout the long run. Lower prices stimulate the interest of a bargain concept to consumers. Lower prices and better quality are factors that come into play when discussing farmers markets.

As Table 1 shows, “part-time growers rely heavily on a farmers market; for many it is their only outlet, and without it they would go out of business.” Although some markets already have an established consumer base and a highly regarded reputation, most vendors barely make ends meet. The big question is why? If the product is better and costs less (in most situations), why are these vendors not earning a better income? The only feasible reasoning is that there is simply not enough published awareness about the markets. By providing concrete numbers and statistics, we will be able to provide reasoning to induce support to the local markets and ensure a prosperous future for the local farmers and agriculture within the community.

## Objectives

The main objectives of this study include:

1. Advising local farmers who participate in markets how to more competitively price their products. The primary purpose of this study is to provide concrete analysis with numbers to

Table 1. Vendors' Use of Farmers Markets.

	Full-time growers	Part-time growers	Non-growers	Significance level
Days at market (average)	18	19	13	p<.05
Vendors selling more than 30 days (%)	11	22	0	NS
Vendors selling at more than one market (%)	55	36	19	p<.05
Vendors who would be out of business or hurt considerably if their current market closed (%)	30	59	47	p<.10
Sales at various outlets as share of total (average, %)				
Farmers market	35	68	59	p<.05
Road-side stand or pick-your-own	30	16	3	p<.05
Wholesale	19	4	7	p<.05
Craft shows	7	8	21	p<.05
Sales at farmers market (% of vendors)				
>\$1000	83	55	48	
\$500 to \$1000	11	22	10	p<.05
<\$500	6	24	42	
<25% of total sales	63	27	35	
>25% of total sales	37	73	65	p<.05

Source: Lyson, Gillespie, and Hilchey (1995).

better advise farmers how to more competitively price their produce so that they may attract a broader consumer base. To ensure sustainable agriculture it is important to start at the bottom. To provide a better source for consumers to purchase fresh produce, we are starting at the bottom by advising local farmers on their pricing. If their product is priced competitively they will receive a broader customer base, which will ensure that they will be able to continue participating in the markets and ultimately will allow them to continue to grow and produce their products. This will ensure that Florida agriculture will have a foundation that is financially supported by the local community.

2. Collecting price analysis data among farmers markets and grocery stores. The same types of produce will be analyzed based on a price relationship alone. The results of this study will be examined on a per county basis to provide further recommendations on pricing and encouraging awareness for each market.
3. Analyzing and interpreting data. Once the price data and completed surveys have been obtained, further investigation among possible relationships between the two sources will be examined. Through this examination process we hope to draw conclusions to better advise the vendors on how to more so competitively price their product(s).

4. Obtaining and distributing information among the community. As a land-grant university, the University of Florida holds a certain responsibility to the community to obtain and distribute valuable information to provide solutions for their everyday way of life. By offering consumers price information on how they can access less expensive produce, we are not only ensuring a stronger customer base for the farmers but are also providing consumers with an alternate purchasing option for produce than grocery store that often offers a lower price.

### Approach and Methods

To properly advise farmers how to more competitively price their produce, the remaining objective approaches and methods must be utilized as well. Once prices are collected from farmers markets and from the closest surrounding grocery store, a price relationship between the two will be established. Taking into consideration the quality of the produce from both sources, ease of access, price difference, quality assurance, and marketing procedures—among other factors—will help produce a more viable advising plan of action. We are not only looking at prices at the two sources; we are studying extenuating circumstances that might possibly influence a consumer's purchase decision making. By taking all factors into consideration and shining light upon the price benefits and cost savings, we will convey advice to the farmers that participate in the markets on how to more efficiently price and advertise their product. In the same respect, we would hope to publish articles and work with the University of Florida's Institute of Food and Agricultural Sciences (IFAS) to draw awareness to the farmers markets from the public and concentrate on conveying cost savings by shopping for produce locally at a market.

In order to collect price analysis data among farmers markets and grocery stores, we have devised a survey that will collect not only prices but feedback from the vendors participating in the markets. By collecting prices and feedback, we can further identify and investigate relationships among the two sources.

Once the qualitative and quantitative data are collected they will be processed through the proper

data analysis mechanics and a report of findings will be drawn up. Once a findings report is composed, information will be distributed to farmers market vendors and small or part time farmers throughout the state of Florida. Recommendations and strategy implementation will also be distributed to the vendors to help them more competitively price their items so that they may attract a broader customer base and maintain the current base of consumers that visit them regularly. A research article will also be compiled and will hopefully be recommended for publishing.

As mentioned above, all findings will be distributed throughout the state of Florida to allow vendors to properly utilize the findings and conclusions between pricing of the two sources that we have investigated. The purpose of collecting, analyzing, and distributing the information found is primarily to help the vendors who depend so heavily on these farmers markets for their main source of income. With advisement and proper evaluation of their current inventory prices, they can better position themselves to be more competitive and ensure a thriving future for themselves and the farmers markets as a whole.

### Average Percent Cost Savings Model Approach

$$(1) Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_3 x_5 + \varepsilon, \\ E[\ln(\text{Avg}\% \text{CostSavings})] = \beta_0 + \beta_1(\text{FMPrice}) \\ + \beta_2(\text{AvgGSPrice}) + \beta_3(\text{Fulltime}) + \\ \beta_4(\text{FTPTPriDiff}),$$

where *Avg%CostSavings* is an average percent savings a consumer will achieve by purchasing produce at a given farmer's market in Florida, when compared to purchasing the same "basket" of produce at surrounding grocery stores. A natural log of the coefficient was chosen because *average cost savings* will be interpreted as an overall percent change; *FMPrice* is the price of a variety of produce at the farmers market; *AvgGSPrice* is the price average of the corresponding variety of produce at the surrounding grocery stores closest to the farmers market (i.e., competitors of the farmers market); *Fulltime* is a dummy variable that takes on a value of 1 if the vendor considers themselves full-time or a 0 if they consider themselves part-time; and *FTPTPriDiff* is an interaction term between the dummy

variable, *Fulltime*, and the price difference between the farmers market and the grocery store for each variety of produce.

**Pricing Model per Region Approach**

$$(2) Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \epsilon,$$

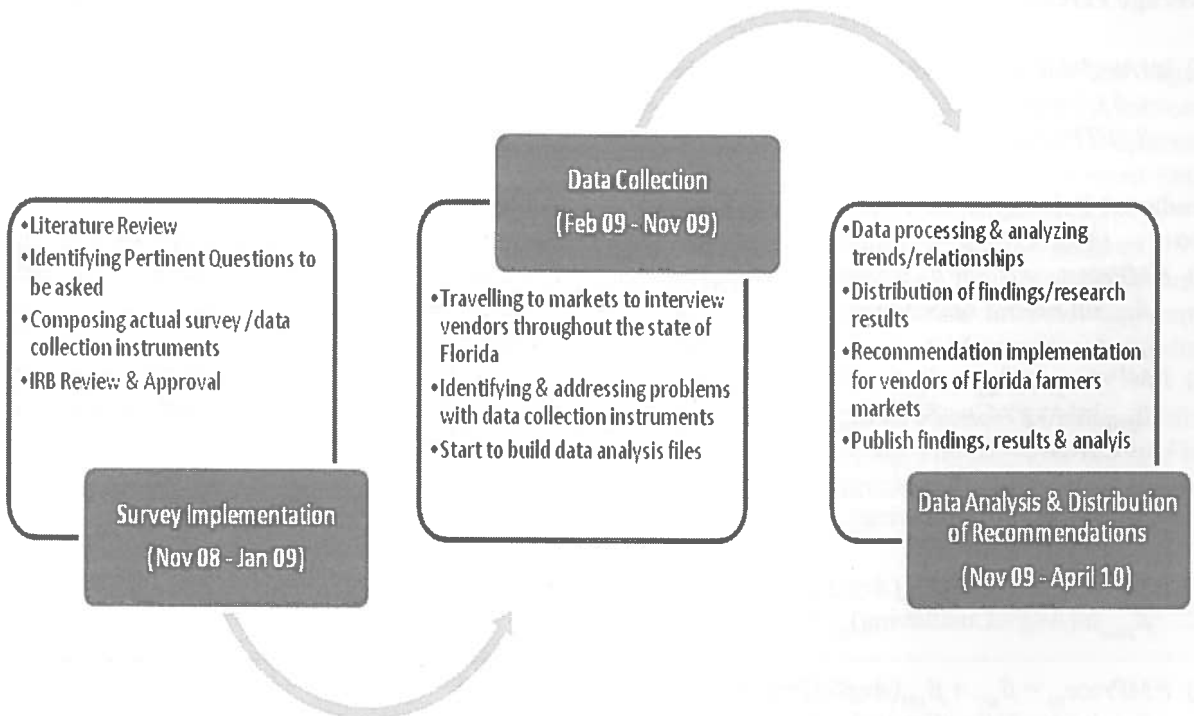
$$E[FMPrice]_{Rn} = \beta_{0Rn} + \beta_{1Rn} (AvgGSPPrice)_{Rn} + \beta_{2Rn} \ln(Avg\%CostSaving)_{Rn},$$

where *FMPriceRn* is the price of a variety of produce at a farmers market in a given region *Rn*; *AvgGSPPriceRn* is the price average of the corresponding variety of produce at the surrounding grocery stores closest to the farmers market within a given region *Rn*; and *Avg%CostSavings* is an average percentage savings a consumer will achieve by purchasing produce at a given farmers market that is a part of region *Rn*, when compared to purchasing the same “basket” of produce at surrounding grocery stores. A natural log of the coefficient was

chosen because average cost savings will be interpreted as an overall percent change.

**Timetable**

The survey implementation phase began in November of 2008 (Figure 1). Throughout this phase a literature review was conducted, pertinent questions to be asked throughout the survey instrument were created, the actual survey and data collection instruments were designed, and IRB review and approval was obtained. This first phase was conducted through January of 2009. The second phase of data collection began in February of 2009 and will continue throughout November of 2009. During this phase we will be travelling to farmers markets throughout Florida to interview vendors who are participating in the markets. We will also identify and address problems with the data collection instruments and we will start to build data analysis files. The final phase of the process is the



**Figure 1. Timetable.**

data analysis and distribution of recommendations/ findings phase. This phase will begin November of 2009 and will continue through April of 2010. We will process the data and analyze the trends and relationships that may or may not exist between farmers markets and grocery stores. Results and findings will be distributed to vendors and small or part time farmers throughout Florida; we will also submit articles to pertinent journals and to IFAS. Recommendation implementation will be the primary objective during this last phase, and vendors will be able to obtain all information available about our research results.

## Results and Conclusions

Data were collected from farmers markets across the state of Florida. The data were further broken down into five regions across the state. Each region area was selected purely on the basis of farmers market atmosphere and how similar the markets were to one another. The markets are essentially competitors to one another. Grouping markets in this way will ensure the appropriateness of each pricing model per region.

### Average Percent Cost Savings Model:

$$(3) \ln(\text{Avg}\% \text{CostSaving}) = \beta_0 + \beta_1(\text{FMPrice}) + \beta_2(\text{AvgGSPrice}) + \beta_3(\text{Fulltime}) + \beta_4(\text{FTPTPriDiff}) + \varepsilon.$$

### Predicted Pricing Model; modeled per Region:

$$(4) \text{FMPrice}_{R1} = \beta_{0R1} + \beta_{1R1}(\text{AvgGSPrice})_{R1} + \beta_{2Rn1} \ln(\text{Avg}\% \text{CostSaving})_{R1} + \varepsilon,$$

$$(5) \text{FMPrice}_{R2} = \beta_{0R2} + \beta_{1R2}(\text{AvgGSPrice})_{R2} + \beta_{2Rn2} \ln(\text{Avg}\% \text{CostSaving})_{R2} + \varepsilon,$$

$$(6) \text{FMPrice}_{R3} = \beta_{0R3} + \beta_{1R3}(\text{AvgGSPrice})_{R3} + \beta_{2Rn3} \ln(\text{Avg}\% \text{CostSaving})_{R3} + \varepsilon,$$

$$(7) \text{FMPrice}_{R4} = \beta_{0R4} + \beta_{1R4}(\text{AvgGSPrice})_{R4} + \beta_{2Rn4} \ln(\text{Avg}\% \text{CostSaving})_{R4} + \varepsilon,$$

$$(8) \text{FMPrice}_{R5} = \beta_{0R5} + \beta_{1R5}(\text{AvgGSPrice})_{R5} + \beta_{2Rn5} \ln(\text{Avg}\% \text{CostSaving})_{R5} + \varepsilon.$$

## Full Pricing Model per Region

Region 1: Avg CS/lb \$0.69, Avg %CS 30.93%.

$$(9) E[\text{FMPrice}]_{R1} = -0.59014 + 0.426(\text{AvgGSPrice})_{R1} - 0.9076 \ln(\text{Avg}\% \text{CostSaving})_{R1}.$$

Region 2: Avg CS/lb \$0.63, Avg %CS 10.59%.

$$(10) E[\text{FMPrice}]_{R2} = -0.501 + 0.426(\text{AvgGSPrice})_{R2} - 0.6427 \ln(\text{Avg}\% \text{CostSaving})_{R2}.$$

Region 3: Avg CS/lb \$0.64, Avg %CS 28.71%.

$$(11) E[\text{FMPrice}]_{R3} = -0.4433 + 0.497(\text{AvgGSPrice})_{R3} - 0.5267 \ln(\text{Avg}\% \text{CostSaving})_{R3}.$$

Region 4: Avg CS/lb \$2.12, Avg %CS 39.03%.

$$(12) E[\text{FMPrice}]_{R4} = -0.1352 + 0.2444(\text{AvgGSPrice})_{R4} - 0.36443 \ln(\text{Avg}\% \text{CostSaving})_{R4}.$$

Region 5: Avg CS/lb \$0.22, Avg % CS 13.06%.

$$(13) E[\text{FMPrice}]_{R5} = -0.36318 + 0.6931(\text{AvgGSPrice})_{R5} - 0.26710 \ln(\text{Avg}\% \text{CostSaving})_{R5}.$$

## Addressing First Objective

*Promoting Average Grocery "Basket" Cost Savings to Consumers*

Testing difference in price (GS-FM) and vendor full-time status influence on overall average percent cost savings:

$$\text{Test: } H_0: \beta_n = 0 \quad H_a: \beta_n \neq 0.$$

F-Test:

$$F_{\text{obs}}: 54.75$$

$$F_c: 3.319.$$

Because  $54.75 > 3.319$ , we reject the  $H_0$  and conclude in favor of the  $H_a$ , which states that the

difference in price (GS-FM) and vendor full-time status do influence overall percent cost savings.

$$(14) E[\ln(\text{Avg}\% \text{CostSaving})] = -0.561 - 0.823(\text{FMPrice}) + 0.2234(\text{AvgGSPrice}) - 0.2058(\text{Fulltime}) + 0.0716(\text{FTPTPriDiff}) .$$

### Comments

A one-unit increase in the price of produce at a farmers market causes change in average cost savings to decrease by 0.823 percent. A one-unit increase in the average grocery store price causes change in average cost savings to increase by 0.2234 percent. We first expected that if the vendor was full-time their prices would be lower (less overhead/product). However, the opposite is the case. When a vendor is considered to be full-time, the change in average cost savings decreases by 0.2058 percent.

### Addressing Second Objective

#### *Advising Vendors at Farmers Markets on How to Competitively Price Their Produce*

The average grocery store price and average cost savings at a farmers market should influence how produce is priced at a farmers market.

$$\text{Test: } H_0: \beta_n = 0 \quad H_a: \beta_n \neq 0.$$

F-Test for each Region:

$$F_{\text{obs,R1}}: 251.00 \quad F_{\text{c,R1}}: 4.977 \quad \text{P-Val: } <0.0001 \\ \text{Reject } H_0$$

$$F_{\text{obs,R2}}: 75.58 \quad F_{\text{c,R2}}: 4.787 \quad \text{P-Val: } <0.0001 \\ \text{Reject } H_0$$

$$F_{\text{obs,R3}}: 198.21 \quad F_{\text{c,R3}}: 4.787 \quad \text{P-Val: } <0.0001 \\ \text{Reject } H_0$$

$$F_{\text{obs,R4}}: 1082.3 \quad F_{\text{c,R4}}: 4.977 \quad \text{P-Val: } <0.0001 \\ \text{Reject } H_0$$

$$F_{\text{obs,R5}}: 281.30 \quad F_{\text{c,R5}}: 4.787 \quad \text{P-Val: } <0.0001 \\ \text{Reject } H_0$$

We would conclude that the average grocery store price and average cost savings at a farmers market does influence how produce is priced at the market.

### Comments

We will use the model for Region 2 as an example for interpretation. A one-unit increase in the average price of produce at a grocery store will cause that same produce's price to increase, but only by 0.426. This is more than a 50 percent savings obtained by purchasing produce at a farmers market. A one percent increase in average cost savings will cause the expected farmers market price for an item to decrease by 0.6427. This makes sense, because in order for average cost savings to increase the FM-Price must decrease. Although a D.V. cannot impose a change on an I.V., the relationship makes sense.

### References

- Dong, D. and B. H. Lin. 2009. "Fruit and Vegetable Consumption by Low-Income Americans: Would a Price Reduction Make a Difference?" Economic Research Report 70. United States Department of Agriculture.
- Lyson, T., G. J. Gillespie, and D. Hilchey. 1995. "Farmers Markets and the Local Community: Bridging the Formal and Informal Economy." *American Journal of Alternative Agriculture* 108-113.
- Payne, T. 2002. "U.S. Farmers Markets 2000: A Study of Emerging Trends." *Journal of Food Distribution Research* 173-175.