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Direct-to-Consumer Sales of Farm Products: Producers and Supply Chains in the Southeast

Mary Ahearn and James Sterns

Given the geography and agroclimatic conditions of the Southeast, coupled with continued population expansion from in-migration, local foods markets may be a promising niche market for some farms in the region. The Southeast has more small farms than any other U.S. region. Using farm-level data, we address the question of how successful southeastern farms engaged in direct sales to consumers differ from other farms. We also include a case study of a marketing association in the panhandle of Florida. In both analyses, we focus on the role of the supply chain for direct sales in explaining farm returns.

Key Words: direct farm sales, farm profitability, farmers' markets, local foods, local supply chain

JEL Classifications: Q12, Q13

There is an increased interest from the general public in the structure of agriculture and the way our food is produced, processed, and marketed as evidenced by many popular press reports (e.g., Gaytán, 2004; Pollan, 2010). National policymakers have been responsive to this interest. For example, the U.S. Department of Agriculture (USDA)-wide initiative called *Know Your Farmer, Know Your Food* (KYF2) coordinates programs funded through the latest 2008 Farm Act that are associated with local foods (USDA Office of the Secretary, 2012). Similarly, farmers and many participants along the whole food supply chain have been responsive to this growing public interest.

According to the 1978 Census of Agriculture, 125,186 farms, or 5.6% of farms, engaged

in direct sales to consumers (nonedible products are excluded). Since 1978, the number of direct-sales farms has waxed and waned until the 1992 Census; since that time, the number has slowly increased. According to the 2007 Census of Agriculture, 136,817 farms marketed directly to consumers. Most of these farms counted in the 2007 Census of Agriculture were small farms (97.2%) with a gross value of sales for all commodities under \$50,000. In contrast, for all U.S. farms, 78.1% of farms had gross sales under \$50,000. The Agricultural Resource Management Survey (ARMS) is an annual representative sample of farms that provides information on the intercensus trends. The 2010 ARMS indicated that the number of direct-sales farms numbered 230,006, continuing the increase in farms marketing directly to consumers.

It is worth noting that the increase in farms marketing directly to consumers is occurring at the same time that production is concentrating on a smaller share of farms. In 2007, 1.5% of U.S. farms (or 32,886 farms) accounted for half of all production compared with 3.6% of

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farms (or 75,682) only 20 years earlier. The average sales of the farms accounting for half of the product in 2007 were over \$4.5 million. Because by definition direct-sales is a joint production-marketing strategy involving a producer selling directly to a consumer, production on direct-to-consumer farms has not become as highly concentrated over time as it has for the farming sector as a whole. Table 1 provides information on farms marketing directly to consumers at two time periods, 1978 and 2010. The table reports the distribution of farms and their direct sales by the size of their direct sales (in 1978 dollars). In both periods, approximately 10% of the direct sales farms had sales over \$5,000 and accounted for approximately 70% of all direct sales. Although the very largest, 2% in 2010, accounted for just over half of the direct sales—a somewhat larger share of sales than the largest in 1978—their average sales of all commodities was under \$450,000, which according to the 2007 Census of Agriculture was an order of magnitude smaller than the largest 1.5% of farms in the agricultural sector accounting for half of all production.

Because the Southeast has the highest share and number of small farms of the major U.S. regions (Ahearn, Banker, and Korb, 2005), the increased consumer demand for direct-to-consumer marketing of farm products would seem to offer an exceptional opportunity for the farmers and food system of the region. Furthermore, 58% of the value of all commodities sold direct-to-consumer are fruits and vegetables (Martinez et al., 2010), commodity groups

in which southeastern farms have a comparative advantage. Although seemingly poised to offer a market opportunity, the evidence to date suggests that the Southeast is lagging behind the other regions in terms of incorporating a direct-to-consumer component in the development of its regional food system.

There is a large popular press and policy interest in capturing the benefits of both a regional food system and a small farm structure. For example, in response to the 1998 USDA National Commission on Small Farms report, *A Time to Act*, a mission of the Economic Research Service, USDA has been to provide a better understanding of the farm and farm operator characteristics that are associated with the likelihood of above-average returns (e.g., USDA, 1998; USDA-Small Farms Coordination, 2003). Research support for this activity more broadly is evident in an assortment of research grant opportunities targeted at small and midsized farms and local food systems offered through USDA's National Institute for Food and Agriculture. Benefits of small farms and regional food systems are difficult to quantify but often are reported to include environmental, local economic, nutritional, and social benefits. See Martinez et al. (2010) for a review of the evolving literature on the benefits of a local food system.

For the Southeast to capture potential benefits of a regional food system, a farm family must have the economic incentives to be engaged in agriculture through regional food channels. The purpose of this article is to contribute to the analysis of regional food systems

Table 1. Distribution of Farms and Direct-to-Consumer Sales by Value of Direct Sales, 1978 and 2010

Value of Direct Sales, in 1978 Dollars ^a	1978 Census of Agriculture			2010 ARMS in 1978 Dollars ^a		
	No. of Farms	Share of Farms	Share of Direct Sales	No. of Farms	Share of Farms	Share of Direct Sales
\$1–999	73,538	59%	7%	129,062	56%	5%
\$1,000–4,999	38,227	31	21	79,323	34	22
\$5,000–29,999	11,315	9	31	16,099	7	20
> \$30,000	2106	2	40	5521	2	53
All farms	125,186	100	100	230,006	100	100

Source: 1978 Census and 2010 Agricultural Resource Management Survey.

^a Based on gross domestic product implicit price deflator.

by providing a better understanding of the farm-level economic challenges faced by producers in the southeastern region, including the marketing environment for direct-to-consumer sales. We begin by explaining regional differences in selected indicators of the food system to gain a better understanding of how the Southeast differs from other regions. Next we describe the factors explaining the profitability of a representative sample of farms engaged in direct-to-consumer sales in the region and complement that analysis with the lessons learned about the challenges in direct-to-consumer sales through a case study in the panhandle of Florida. In both approaches, the representative farm sample and the case study, we consider farm characteristics as well as the local marketing environment.

Regional Differences

A common regional classification of the United States is the one used by the Bureau of Economic Analysis (BEA), U.S. Department of Commerce, which delineates eight regions. BEA's Southeast region includes the states of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia. Direct-to-consumer markets include sales from farmers' markets, roadside stands, pick-your-own, and catalog and Internet sales. Regionally, the Southeast has a small share of its farms engaged in direct-to-consumer sales, 4.9% according to the 2007 Census of Agriculture (Table 2). Only two other regions, the much more sparsely populated Plains and Southwest, have a lower share of their farms engaged in direct-to-consumer marketing. Contrast this with New England, another region with a large share of small farms, but where more than 25% of its farms were engaged in direct-to-consumer marketing in 2007. The New England direct-to-consumer sales accounted for 6.85% of the region's total sales—compared with 0.30% in the Southeast in 2007. The USDA's ARMS also collects information from a sample of U.S. farms (USDA Economic Research Service [ERS], 2012a). Combining the 2009–2010 samples (to increase sample size) indicates that all

Table 2. Regional Characteristics of Direct-to-Consumer Marketing

BEA Region	New England	Mideast	Great Lakes	Plains	Southeast	Southwest	Rocky Mountain	Far West
Number of farms with direct sales, 2007 ^a	7,168	16,429	25,837	16,245	28,314	14,205	8,369	18,960
Share of all farms with direct sales, 2007 ^a (percent)	25.40	13.10	7.40	3.50	4.90	3.80	7.00	11.70
Share of all farms that sell to CSA's, 2007 ^a (percent)	2.70	0.80	0.50	0.40	0.50	0.40	0.50	1.10
Direct sales as a share of all sales, 2007 ^a (percent)	6.80	1.50	0.40	0.10	0.30	0.20	0.30	0.60
Farmers markets in 2012 ^b	761	1222	1334	838	1587	387	377	1174
Increase in farmers' markets, 2009–2012 ^c (percent)	35.90	47.20	57.90	39.00	58.70	52.40	51.40	50.50
Farmers markets per 100,000 population, 2012 ^c	5.3	2.6	2.9	4.1	2	1	3.5	2.3
Average county share of population with low access to grocery stores, 2010 ^c (percent)	11.40	12.10	14.50	13.90	20.40	19.70	14.20	15.50
Share of U.S. agricultural sales, 2009–2010 ^d (percent)	1	5	17	32	19	10	5	11
Share of U.S. population, 2010 ^c (percent)	5	16	15	7	25	12	4	17

^a USDA, NASS, 2009. CSA is Community Supported Agriculture.

^b USDA Agricultural Marketing Service, 2012.

^c USDA Economic Research Service, 2012b.

^d USDA Economic Research Service, 2012a.

of the regions have experienced an increase since 2007 in the share of farms using direct-to-consumer marketing with several of the regions, including the Southeast, at least doubling the share of farms with direct-to-consumer sales.

Farms also market their commodities directly to retail and institutional establishments such as restaurants and schools.¹ Data about these direct-to-retail/institution sales were first collected on the 1998 ARMS at the national level and the share of farms engaged in these types of sales has been very low as recently as 2010 (i.e., 3–4%) but stable. Low and Vogel (2011) documented the extent of local food sales in 2008, including direct-to-retail-establishment/institutions. Based on the ARMS data, they reported that although the majority of farms engaged in local food sales sold directly to the consumer such as at farmers' markets, a larger share of the value of local foods sales were marketed through retail and institutional establishments that provided products directly to consumers.

The advantage of selling to retail and institutions, of course, is the result of the lower unit costs of production and marketing transactions. For example, direct-to-consumer marketing is often very labor-intensive involving unpaid farmer time. This helps explain the growth in food hubs, currently numbering 141 (USDA ERS, 2012b). Food hubs aggregate local commodities and then arrange for sales to local retail establishments and institutions who are interested in buying in quantity (Diamond and Barham, 2012).

There are not adequate data on the number, size, and performance of the various marketing outlets for direct-to-consumer or retail/institutional establishments.² The best data that do exist are for farmers' markets and there is

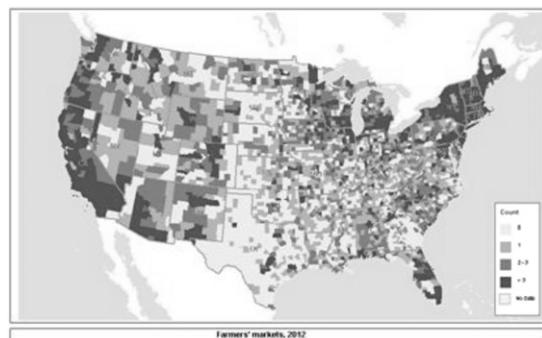


Figure 1. Distribution of Farmers Markets, 2012 (Source: USDA, ERS, 2012b, based on data from USDA, AMS.)

strong evidence that the number of farmers' markets is increasing at the national level as well as the state and regional levels.³ In 1994, there were 1755 farmers' markets in the United States. In 2012, there were more than 7864 (Figure 1). From 2009 to 2012, the number of farmers markets increased by 49% (USDA Agricultural Marketing Service, 2012). Across regions, the Southeast had the largest percent increase in the number of farmers markets between 2009 and 2012 at 58.7% (Table 1). However, relative to the population of the Southeast, the region is relatively underserved with only two farmers markets per 100,000 population in 2012. This is not unlike the situation for access to grocery stores, where the Southeast, on average, has 20% of a county's population characterized as low-access (USDA ERS, 2012b).

Returns to Farms Using Direct-to-Consumer Marketing

To improve our understanding of why we observe relatively less direct-to-consumer marketing by farmers in the Southeast, we address the question of what factors affect the ability of farms in the Southeast to be successful marketing direct-to-consumer. We consider all farms in the region that had a positive value

¹ Although there is no consensus on the definition, local foods are often recognized based on the marketing arrangements such as direct-to-consumer and sales made to retail establishments and institutions (Martinez et al., 2010).

² Research with a goal of focusing on fully characterizing a supply chain rely on case studies, like in King et al. (2010).

³ Of the more than 3,000 counties in the contiguous states, the number of farmers markets declined in only 230 counties between 2009 and 2012.

of direct sales. The majority of farms with direct sales sell directly to consumers rather than retail outlets such as restaurants that sell to consumers. For the overwhelming majority of these farms, direct sales comprise less than half of their gross sales. We estimate a logit model of farm success using data from the USDA ARMS (USDA ERS, 2012a).

Depending on the purpose, there are many ways to measure returns from farming such as net farm income, net cash income, returns on assets, and returns on equity (El-Osta and Johnson, 1998; Farm Financial Standards Council, 2013; McBride and El-Osta, 2002). We focus on two measures, net cash farm income (NCFI) and returns on assets (ROA). Net cash farm income is a short-run measure of returns, calculated as gross cash income less cash operating expenses. As such, it excludes noncash items. By far the major noncash item is depreciation expense. Net cash farm income excludes consideration of payment for capital through capital expenditures or through depreciation.

It is not uncommon for farms to lose money farming, especially if tax depreciation is included with expenses and especially for small farms. A farm can stay in business in the short run without replacing capital, but eventually capital will depreciate and require replacement for a farm to stay in business. Hence, we also consider return on assets, a long-run measure of profitability, calculated as net farm income less an estimate of unpaid labor and management and before payments for interest divided by the value of farm assets. The net farm income estimate in this calculation includes all cash and noncash items. The importance of using the return on asset measure also comes from the inclusion of the costs associated with unpaid labor and management, because direct marketing is known to require additional time spent marketing compared with other marketing options (Hardesty and Leff, 2010).

Our focus is on identifying factors that contribute to success, and not levels of success, so we have classified farms into successful and not successful farms using the two measures of returns. In the first model, our dependent variable takes on the value of zero when a farm has

zero or a negative net cash farm income and a value of one when a farm has a positive net cash farm income. In the second model, our dependent variable takes on the value of zero when a farm has a rate of return on farm assets of less than 0.01% and a value of one otherwise. More specifically, the logit model is defined as the natural logarithmic value of the odds in favor of being a successful farm. That is:

$$L_{ij} = \ln(P_{ij}/[1 - P_{ij}]) = \alpha + \beta'X_{ij},$$

$$i = (1, \dots, n) \text{ and } j = (NCFI, ROA),$$

where L_{ij} is the log likelihood function that the i th farm is successful when considering the j th success measure, P_{ij} is the conditional probability of a direct-to-consumer farm being successful given X_{ij} , X_{ij} are farm characteristics, operator household characteristics and characteristics of the local marketing environment, and β' is a vector of parameters to be estimated. Table 3 provides the definitions and means of the independent variables of X_{ij} . The variables fall into three categories: those that describe the household (including the human capital of the principal operator), farm characteristics, and those that describe the relevant local marketing environment faced by a farm engaged in direct-to-consumer marketing. Human capital characteristics include the age and education of principal operators, although it is recognized that these are less than ideal measures of the quality of human capital in farm management. Human capital variables are hypothesized to be positively related to the likelihood of being successful in farming (El-Osta, 2011). Household participation in the off-farm job market is expected to be negatively related to success on the farm, because it draws labor and management away from the farm enterprises (El-Osta, Mishra, and Ahearn, 2004). In terms of farm characteristics, farms whose majority of value of production is from crop commodities are expected to have a greater chance for success because of the financial conditions for crop vs. livestock production during the 2009–2010 period. The risk management strategies of participating in a government program or diversifying production are expected to be positively related to success in farming. The size

Table 3. Summary Statistics and Variable Definitions

Variable	Label	Mean	Standard Deviation
AGE	Age of primary operator	57.696	146.954
AGESQ	Age of operator Squared	3484.950	17138.350
EDUC	Education of primary operator, years	13.357	27.130
TOTOFIPY	Total off-farm income for previous year	56.833	899.617
CROP	Majority of commodity value in crops, yes = 1	0.462	5.865
%DRTSLS	Share of gross income from direct sales	0.496	11.571
GOVPART	Participate in government direct payment programs	0.204	4.743
ENTROPY	Index of equality of value of production	0.115	1.539
SIZE	Gross value of sales	43.147	1777.110
LEVERAGE	Percent with debt-to-asset over 0.4	0.064	2.885
%LOCLFARM07	Farms in county with direct sales (%), 2007	5.724	34.335
FMRKT09	Farmers' markets in county, 2009	1.227	20.137
%CH_FMRKT_09_12	Farmers' markets (% change) in county, 2009–2012	29.742	847.100
%LACCESS_POP10	County Population, low access to grocery store (%), 2010	18.342	129.849
ADJ	Metropolitan county or adjacent to metropolitan area, metropolitan = 1	0.750	5.088
%NWHITE10	Percent white in county, 2010	74.905	227.010
POVRATE10	Poverty rate in county, 2010	18.713	67.011
%POSNCFI	Percent with positive net cash farm income	0.350	5.612
%ROA>.01	Percent with returns on assets of 0.01% or more	0.117	3.785

of the farm and the share of the sales from direct-to-consumer transactions are expected to be positively related to the likelihood of farm success resulting from economies of size. Being highly leveraged is expected to be negatively related to farm success.

Demand and supply variables capturing the local marketing environment faced by a farm family engaged in direct-to-consumer marketing include the share of farms in the county engaged in direct sales, the availability of farmers markets in a county, and being in a metropolitan county or adjacent to a metropolitan county. It is difficult to predict the hypothesized relationships of these variables because, on the one hand, they are expected to be positively related to the likelihood of successful direct-to-consumer farms because they are indicators of a well-developed supply chain for local food production. On the other hand, relative to the demand for local food, high levels of these variables could be an indication of a highly competitive local foods marketplace faced by a producer, possibly adversely affecting market prices or even the ability to sell locally.

We have also included a measure of the share of the county population with low access to grocery stores, which we expect to be positively related to the likelihood of success of direct-to-consumer farms because direct farm sales can serve as a substitute for the grocery store access (Dutko and ver Ploeg, 2013). Finally we include some basic demographics of the county population including the percent of the county white and in poverty. Our expectation for these demographic measures is uncertain simply because the previous literature has provided very mixed results (Martinez et al., 2010).

Data Sources

The ARMS is USDA's primary instrument for collecting data on the financial performance of farm businesses and the characteristics of the operators and households that operate U.S. farms. Furthermore, the ARMS data include a geospatial county identifier, so we are able to link county-level characteristics that are relevant to the local marketing environment. The

ARMS data are designed to be representative of the U.S. population of farms at the national level and for major regions and some states. However, because farms engaged in direct-to-consumer sales are a relatively small share of all U.S. farms, we use two strategies to increase our ARMS sample size of farms engaged in direct-to-consumer marketing: we use data from both the 2009 and 2010 ARMS and we expand BEA's definition of the Southeast to include Delaware, Maryland, Oklahoma, and Texas. This subset of states represents the three Bureau of the Census divisions that comprise the southeastern portion of the continental United States: the South Atlantic (Delaware, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia), the East–South–Central (Alabama, Kentucky, Mississippi, and Tennessee), and the West–South–Central (Arkansas, Louisiana, Oklahoma, and Texas). We continue to refer to this region as the Southeast.

The ARMS has a complex sample design: each observation has 30 replicate weights. To account for this sample design, we used a jackknife approach to model estimation (Dubman, 2000; Kott, 1998). Furthermore, because we have split the sample to address our research questions, thereby affecting the usefulness of the weights, we used the delete-one-observation jackknife procedure. The model was estimated using SAS (SAS Institute Inc., Cary, NC).

The ARMS is the source of data on farm characteristics and human capital characteristics of the farm operator. In addition, we include county-level variables from the Food Environment Atlas to capture the local marketing environment. The Food Environment Atlas is a county and state database of variables compiled from a variety of sources that relate to food issues in general (USDA ERS, 2012b). The 2007 Census of Agriculture is the original source of data on the number of farms in a county with direct-to-consumer sales. The USDA Agricultural Marketing Service is the original source of data on farmers markets, the USDA Economic Research Service constructed the share of population with low grocery store access and metropolitan adjacency based on data from the Bureau of the Census,

and the demographic variables in the Food Environment Atlas are originally from the Bureau of the Census.

Results

The logit results for the success in farming models for the southeast are provided in Table 4. The discussion here emphasizes the significance and sign of the independent variables and any differences in success for the two models (i.e., the model for the short-run measure of a positive net cash farm income and the model for the long-run measure of a return on asset of 0.01 or greater). Beginning with the human capital variables, AGE was not significant in either model; however, AGESQ was significant in both models. The lack of significance with AGE indicates no simple relationship with performance. The positive sign of AGESQ indicates that, for older age groups, age is positively related to performance. Senior

Table 4. Logit Results for Farms with Direct-to-Consumer Sales Earning Positive Net Cash Farm Income (NCFI) and Return on Asset of 0.01 or Greater (ROA), 2009–2010

Variable	NCFI	ROA
INTERCEPT	3.495	-1.199
AGE	-0.044	0.002
AGESQ	0.000***	0.000***
EDUC	-0.075*	0.123*
TOTOFIPY	-0.005***	-0.006***
CROP	0.619	0.263
%DRTSLS	-0.529	0.171
GOVPART	0.872	0.237
ENTROPY	1.563	-1.357
SIZE	0.008	0.005***
LEVERAGE	-0.836	-0.963
%LOCLFARM07	-0.051*	-0.145*
FMRKT09	-0.016	0.072
%CH_FMRKT_09_12	0.003***	0.005***
%LACCESS_POP10	-0.023**	0.012**
ADJ	0.581	-0.055
%NHWWHITE10	-0.011**	-0.015**
POVRATE10	-0.077**	-0.074**
Sample size	564	
McFadden's R^2	0.185	0.182

Source: USDA Economic Research Service, 2012a.

*, **, *** denotes significance of 0.10, 0.05, and 0.01, respectively.

farmers may have lower farm returns than some younger farmers, but they also have low expenses, including those associated with obtaining control of land and other assets such as rental expenses and interest payments on farm loans. The relationships are best understood in the context of the usual life-cycle process of a farmer as he or she accumulates wealth over his or her lifetime, has highly productive years on the farm in midlife, and maintains the farm life well into his or her senior years (Ahearn, 2013). Farmers often gradually transition into retirement with very high asset values and low expenses associated with controlling productive assets. Their gross farm returns are, on average, lower than midlife farmers and often come from renting out farmland or participating in the Conservation Reserve Program.

The other human capital variable, OPEDUC, was significant in both models but with opposite signs. For the short-run performance indicator, OPEDUC was negatively related to performance and for the long-run performance indicator, OPEDUC was positively related to performance. Operators with higher educational attainment levels have a greater opportunity cost for their time. A cost of their time is accounted for in the long-run model, so perhaps the difference here in the two models can be explained by a more efficient use of their time on the farm. Off-farm income was negatively related to farm profitability in both models. These results are consistent with the notion that direct marketing requires significant amounts of time, something that is less available to those working at off-farm jobs. Size of farm is positively related to farm profitability for both models, which is the usual result for farms, regardless of their region, specialty, or marketing strategy resulting from economies of size.

Of special interest here are the variables intended to capture the supply chain and general marketing environment for direct-to-consumer sales. The share of farms in a county engaged in direct sales was negatively related to both performance measures, possibly indicating that farmers are facing a more competitive marketplace as a larger share of farms in the local area become engaged in direct sales, but oftentimes

without a well-developed local supply chain. The recent growth in farmers' markets had a significant positive impact on the returns in both models. The share of the county population with low access to grocery stores was expected to be positively related to performance of direct-to-consumer farms, which offered a grocery store alternative to a food source. Our expectation was met for the long-run model of performance, ROA, but not for the NCFI performance model. So, although the greater market opportunities did not lead to a greater likelihood of success in the short run based on net cash income, when an imputed cost was accounted for with returns for the unpaid labor contributed by farmers in relation to the farm assets, low grocery store access tended to increase the likelihood of farm success.

The percent of the population that was white and the percent of the population that was below poverty levels were both negatively related to the performance of direct sales farms in both models. The southeastern region has wide spatial areas of poverty with a long history of persistent poverty compared with the majority of other U.S. regions where poverty is concentrated in smaller areas. The breadth of poverty in the South has likely adversely impacted the general economic structure in these areas.

Lessons from a Case Study

The farm-level analysis presented previously does not fully capture the complexity of the issues regarding farm success in direct-to-consumer marketing, especially because the linkages in the supply chain are rapidly, and perhaps unevenly, evolving. Therefore, we present a case study, which provides an illustrative example of the learning experiences of a small group of farmers in the southeastern region who are direct marketing fresh produce by partnering with two major corporations: Wal-Mart and Sysco.

The Panhandle Fresh Marketing Association (PFMA) began in 2007 with a grant from the state of Florida's Department of Agricultural and Consumer Services. The PFMA was created as a 501 C4 not-for-profit organization designed to assist with the marketing efforts of

small to medium-sized farming operations in the western panhandle region of Florida. Its stated mission was to increase the supply and expand markets to meet consumer demand for locally grown food (Panhandle Fresh Marketing Association, 2013). Initial efforts led to the development of a Community Supported Agriculture (CSA) network coupled with a web-based virtual market by which local farmers could post information about available fresh produce they had for sale. Product offerings were limited to fresh produce that was grown seasonally in the region (e.g., broccoli, green cabbage, collard greens, mustard greens, turnip greens, and kale). At its peak, the CSA/virtual market program engaged 39 farmers, but this program did not prove to be sustainable. By the end of 2011, most of the 39 farmers had disassociated from the CSA and PFMA was on the verge of closing down.

The urgency of this situation coupled with a change in staffing led to an internal re-evaluation of PFMA's marketing efforts. Ms. Kayla Gude began working as the association's newly hired marketing coordinator in January 2012. As she noted, several critically important lessons learned were identified and used to reconfigure PFMA's business model (Gude, 2013). These lessons are summarized as follows:

- Quality matters: Consumers had high expectations for product quality when purchasing local fresh produce through the CSA. Customer satisfaction with participation in the CSA was severely compromised when those expectations were not met.
- Product mix matters: Consumers wanted some influence in the availability of products in the CSA, yet farmers tended to grow what was familiar, convenient, and/or low-risk for them. This disconnect between the preferences of customers and farmers eroded the sustainability of the CSA.
- Commitment matters: For the CSA and virtual market to succeed, there had to be a sustained commitment by farmers to use these direct marketing tools as primary market outlets for their production. The PFMA farmers, however, tended to treat the CSA and the virtual market as an auxiliary activity or residual

market to sell produce that was not sold through other outlets.

- Paying to play matters: As a general rule, farmers resisted the PFMA's recommendations that farmers adopt good business practices associated with a CSA such as purchasing liability insurance and paying for third-party food safety audits.
- Past experiences matter: Farmers in this region of the Florida panhandle already had been marketing their produce through various alternatives, including roadside stands, independently negotiated direct-to-retailer sales, and marketing through traditional wholesale outlets and regional terminal markets. These past experiences contributed to the previous two points (i.e., issues related to farmer commitment to the CSA and their willingness to pay for additional operational costs like insurance and food safety audits—costs that were not incurred when marketing through other outlets).

With these lessons in mind, the PFMA began to develop an alternative business model for the farmers in their association. This model was motivated, in part, by the realization that Wal-Mart, as a matter of corporate policy, was launching marketing efforts to stock locally grown fresh produce in their stores. Throughout the United States, Wal-Mart's regional and local store managers were being encouraged to find local sources of fresh produce, so long as it met with company quality standards. The staff at PFMA recognized this unmet demand for local produce as an ideal opportunity for local farmers and began negotiations with several Wal-Mart store managers in their area as well as with the regional manager that had oversight of these stores. Simultaneously, PFMA's marketing coordinator began recruiting local farmers for this new initiative. Although this program offered a potential win-win for both Wal-Mart and the region's farmers, barriers to participation still existed. In part, farmers' lingering memories from PFMA's earlier marketing initiatives meant that some local producers were hesitant to be part of this new initiative. Also, Wal-Mart's requirement that all farmers in this program must pay for and document food

safety third-party auditing of their operations reinforced earlier impressions that these marketing programs added costs to farm operations. Despite these reservations, a small group of farmers (initially, five farming operations) began supplying Wal-Mart stores with fresh vegetables during the 2012 cropping season. The structure of the program evolved such that:

- Farmers were field packing their produce and doing same-day delivery directly to the loading docks of local Wal-Mart stores.
- The program adopted standardized reusable plastic shelf-ready containers that all farmers used for field packing and all Wal-Mart stores adopted for in-store displays.
- Store managers maintained the right to inspect and reject poor-quality produce at the time farmers made their deliveries to these stores.
- PFMA served as the farmers' voice for co-ordinating delivery (e.g., which store, what quantity) and settling disputes. Farmers were told explicitly that they were not to confront store managers directly if a load was being rejected; but rather, farmers were to contact the PFMA marketing coordinator and allow her to resolve the issue.
- PFMA negotiated a fixed price for the entire season, kept track of all transactions, received payments from Wal-Mart, and retained a nominal fee from these payments before distributing them to each farmer who had made deliveries to Wal-Mart. In general, the prices negotiated by PFMA were at or slightly above the seasonal average price, although this price did not match the seasonal high price, thus leaving some farmers dissatisfied with the negotiated price.

As the 2012 growing season progressed, PFMA sought to expand its efforts and program reach as well as to mitigate the risk of being dependent on a single buyer. To that end, PFMA developed a second program, very similar to the Wal-Mart model, for supplying local produce to Sysco. Like Wal-Mart, Sysco insisted that all farmers pay for third-party food safety auditing of their farming operations. An additional requirement was that farmers provide a basic level of traceability with their fresh produce. To meet this requirement, a system of bar-coded labels

along with a date and lot number stamp was implemented such that the labels and stamps were applied while the produce was being packed in the field. Delivery was also modified so that farmers made same-day delivery of freshly harvested produce directly to one of Sysco's distribution centers, located relatively close to the region. As with the Wal-Mart model, the Sysco warehouse manager had the right to reject poor-quality product, whereas PFMA served as the farmers' voice for co-ordinating all of the market transactions.

At the conclusion of the season, the general consensus of all the participants (the PFMA marketing coordinator, the Wal-Mart regional manager, Sysco's buyer, and the participating farmers) was that this program had been successful at providing a local market for farmers and local produce for Wal-Mart and Sysco at a price and volume that was acceptable to all participants.

As the 2013 cropping season was being planned, the PFMA continued to develop this direct marketing model. The biggest constraint to the program from Wal-Mart's and Sysco's perspectives has been inadequate volume, and PFMA continues to aggressively recruit more farmers. The guaranteed local market at a guaranteed price provides a strong incentive for participation, yet unmet demand remains the biggest selling point. This is exasperated by several small regional food service distributors asking PFMA for opportunities to purchase fresh vegetables for their clients as well. As Kayla Gude noted, when she talks with farmers about becoming a supplier for this program, she always includes her current challenge to sustained success. She is certain to remind these farmers that, to quote her, "Your crop is already sold the day it's planted!"

Conclusions

This study began by introducing evidence that the direct-to-consumer markets are lagging in the southeastern region relative to other regions. For some farmers who do not participate in this market, this may be a reasoned decision, because many farms, especially small farms, that participate in the direct-to-consumer

market lose money. Although farmers may be engaged in farming for a variety of reasons, the profit motive is one compelling objective for most farmers who produce an agricultural product. We considered what factors affect the probability of being successful, based on short- and long-run measures of farm profitability, for those southeastern farms that use direct-to-consumer marketing. Age, education, size of farm, and off-farm income all affected the odds of success in a variety of ways.

We were especially interested in what role the local supply chain and market supply and demand factors may play in affecting farm profitability. The most complete data on an aspect of the direct-to-consumer supply chain are farmers' markets data. The rate of increase in farmers' markets was found to be important in explaining the likelihood of farm profitability. Our case study of one marketing association further explored the challenges in marketing locally by the PFMA. PFMA had survived a near extinction and has since rebuilt itself based on the lessons learned, including the importance of identifying reliable producers who were willing to assume additional risk and costs in partnering with PFMA given their prior success record. Moreover, PFMA has been able to rebuild and recruit dependable producers by partnering with established and reliable buyers, namely Wal-Mart and Sysco. Finally, a key to the success of PFMA has been the entrepreneurial role played by the marketing coordinator in building trust among the partners.

Our findings underscore the importance of the continued growth in marketing opportunities for direct-to-consumer sales, sound risk management, and fostering rural entrepreneurship in the southeastern region. The findings relating to farm size and odds for farming success are not uncommon across all marketing strategies, but nevertheless point to a challenge in addressing opportunities for profit-making for small farms.

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