Growing the Local Food Market (Shermain D. Hardesty, University of California Davis, Organizer)

THE GROWING ROLE OF LOCAL FOOD MARKETS

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Interest in locally produced foods is increasing in the United States. Articles on local foods appear frequently in the popular press. Michael Pollan generated broad interest to the topic with his 2006 book *The Omnivore's Dilemma* (Pollan, 2006). A 2007 nationwide survey of consumers by the Hartman Group (2008) indicated that consumer interest in locally produced foods was driven primarily by the belief that they are healthier. Darby et al. (2008) analyzed stated preference data for locally produced foods among consumers in Ohio; they concluded that demand for local produce exists, and the value consumers place on local production is distinct from other factors such as farm size and product freshness.

Consumers often shop for their locally grown produce (LGP) at farmers markets. USDA's Agricultural Market Service (2007) reports that the number of farmers markets operating nationally rose from 1,775 in 1994 to 4,385 in 2006. A survey of consumers in southeastern Missouri indicated that most consumers perceived local produce at farmers markets as being of higher quality and less costly (Brown 2003). Similarly, in the analysis by Wolf, Spittler, and Ahern (2005), consumers perceived that produce at farmers markets was fresher looking, fresher tasting, of higher quality, and a better value for the money; however, many consumers found shopping at farmers markets too inconvenient. Thilmany and Watson (2004) concluded that

while farmers markets are expected to grow in popularity, producers' needs to balance their marketing activities with the requirements of their production activities made it difficult for some markets to attract producers.

Given the potential limitations of farmers markets, it is important to consider alternative markets for LGP. Community supported agriculture (CSA) programs are clearly such an option; an online registry estimates that CSAs in the United States have grown in number from 50 in 1990 to over 1,000 in 2008 (Local Harvest 2008). Institutions are a potentially larger market. In this paper, we assess the prospects for marketing LGP to colleges, universities, and teaching hospitals. We examine the effects of transaction costs and institutional characteristics on the adoption of LGP buying programs using survey data. In the next section we review previous studies about the institutional market. Next, we present the transaction costs framework for the analysis, describe the empirical model, and then present the results of our logit analysis. The final section is a discussion of the results and some possible structural adjustments to facilitate the marketing of LGP to institutions.

The Institutional Market

The institutional market in the United States is large; in 2006, $30.9 billion was spent in the United States for food at schools and colleges, representing 5.8% of all expenditures for food away from home (USDA-ERS Briefing Room 2008). Another $42.8 billion was spent at other institutions, such as hospitals, corporate cafeterias, prisons, and airlines.

There is already nationwide interest among schools, colleges, hospitals, and other

institutions in purchasing fresh, locally and sustainably produced food. As of May 5, 2008, 134 colleges were listed as operating farm-to-college programs on the Web site www.farmtocollege.org. Annual expenditures for local farm products among 106 colleges responding totaled $23.6 million and averaged $223,000 (Markley 2002).

Despite the potential of increasing demand for LGP in institutional markets, significant barriers have kept most producers from entering these markets. Strohbehn and Gregoire (2002) found the following factors to be the greatest obstacles among sixty-six institutions in Iowa: year-round availability, local and state regulations, working with multiple vendors, obtaining adequate supply, reliable food quantity, and on-time delivery. A national survey of colleges (Markley 2002) indicated price, delivery frequency, working with multiple vendors, product consistency, availability, and volume to be barriers to buying LGP. Murray (2005) identified similar challenges. Nevertheless, demand is growing as an increasing number of farmers seek ways to surmount these barriers.

Transaction Costs

The obstacles mentioned above can be considered as transaction costs to buyers. Buyers and sellers utilize vertical coordination between different stages of production, processing, and distribution to minimize their transaction costs (Hobbs 1997). Hobbs described three types of costs to carry out a commercial transaction: information, negotiation, and monitoring or enforcement costs. Buyers' information costs occur before the purchase decision, such as identifying suitable suppliers and obtaining price quotes. Negotiation costs include those related to preparing vendor approvals and physically carrying out the transaction, such as preparing purchase orders and receiving deliveries. Monitoring costs include ensuring that product delivered is of acceptable quality and processing payments.

MacInnis (2004) examined the role of transaction costs in the marketing choices of organic produce growers; he posited that they could be significant because organic markets were thin and institutional infrastructure was limited. Transaction costs may also affect the ways in which institutions source produce. Kaufman et al. (2000) identified produce sources used by foodservice firms (restaurants as well as institutional operations): broadline distributors

that offer a broad range of food and nonfood products, specialized produce distributors, and grower/shippers. Distributors often specialize in serving specific market segments, such as colleges and hospitals.

In this study we tested the hypothesis that an institution's LGP sourcing practices are influenced by transaction costs, prices, and institutional variables. We analyzed data collected from interviews conducted during 2007 with ninety-nine foodservice managers at California colleges, universities, and teaching hospitals. The dependent variable is an ordered variable indicating the status of the institution's LGP buying program: no LGP buying program, developing a program, or operating a program. The transaction cost variables that could potentially be included in this analysis are described in table 1. The variables and reasons for their inclusion or exclusion in the estimated model are discussed next.

Information Costs

Institutions need to obtain information about potential produce suppliers and their product offerings before they make their purchasing decisions. Product search costs are expected to be more significant in less developed markets, such as the LGP market. MacInnis (2004) used the costs of finding an organic market, obtaining access to existing markets, and searching for best prices as information cost proxies. In this study, the following factors were included as information costs to the LGP purchasing decisions of foodservice managers: availability from their primary produce vendor (*LOCPRI*) and having a broad range of produce available from a single vendor (*LOCRANGE*) and year-round availability of key produce items (*LOCYR*). The importance of these factors was based on the managers' ratings on a Likert scale of 1 to 7 (1 being unimportant and 7 being extremely important). Responses for *LOCRANGE* did not vary greatly; average ratings for institutions across the LGP buying program status categories ranged from 5.6 to 5.8. Thus, this variable was not included in the final model. Data for *LOCPRI* and *LOCYR*, the other information costs, were highly correlated; it is not surprising that a manager would desire year-round availability of key items that are locally grown and want his or her primary produce supplier as the LGP source. *LOCYR* was included in the final model rather than *LOCPRI* because it provided a better fit to the data.

Table 1. Transaction Cost Variables

Variable Description	Variable Name	Measurement
Availability from primary produce vendor	*LOCPRI*	Rate importance of having year-round availability of produce from primary produce vendor
Broad range of products	*LOCRANGE*	Rate importance of having broad range of produce available from vendor (1–7)
Year-round availability	*LOCYR*	Rate importance of having year-round availability of key produce items (1–7)
Definition of locally produced	*LOCAL*	Category ranges, increasing in distance (1–7)
Price stability	*LOCSTAB*	Rate importance of stable produce prices (1–7)
Vendor approval process	*VENAPP*	Does your institution require potential suppliers to go through an approval process? (yes = 1; no = 0)
Liability insurance required	*INSREQ*	Does your institution require liability insurance from produce vendors? (yes = 1; no = 0)
Vendor reliability	*LOCREL*	Rate importance of vendor's reliability in delivering ordered items (1–7)
Number of vendors	*VENDNUM*	Number of produce vendors used (1–3)

Negotiation Costs

MacInnis (2004) used the distance between the producer and the market as a proxy for negotiation costs, with the intuition being that the shorter the distance, the smaller the negotiation costs will be. In this study, managers were asked to define "locally grown"; a surprisingly large proportion (30%) considered "locally grown" to mean 50 miles or less and one-fourth defined it to be a 150-mile radius. We considered the manager's definition of "locally grown" (*LOCAL*) as a negotiation cost; initially, we hypothesized that those with the shorter distances in their definitions had lower negotiation costs, especially since 57% of the institutions had four or more produce deliveries a week. However, an alternative interpretation is that a more "liberal" definition (longer distance) broadens an institution's pool of potential suppliers for LGP. Given the opposing effects of these interpretations on negotiation costs, we expected *LOCAL* not to have a significant effect, and our testing confirmed this.

Institutions seeking to minimize their negotiation costs will place greater importance on having stable prices (*LOCSTAB*) for their LGP: this variable was included in the model. The approval process that most institutions require of their suppliers is a negotiation cost. The summary data indicated that 73% had a vendor approval process (*VENAPP*) and 68% had specific liability insurance requirements (*INSREQ*) for their produce suppliers. Since *INSREQ* is a subset of those responding affirmatively to having a vendor approval process, only *VENAPP* was included in the model to avoid multicollinearity.

Monitoring Costs

The importance of the reliability of delivering ordered items was considered to be a monitoring cost (*LOCREL*); it is a buyer's equivalent of the "failure of buyers to honor commitment" used by MacInnis (2004) as a monitoring cost to producers. However, the survey data indicated that there was limited variation in this variable; the average ratings ranged from 6.4 to 6.5 across the local buying program status categories. It is clear that most managers consider reliability of delivering ordered items to be very important; they do not want to seek out alternative suppliers to fill in the missing products on short notice. Given the lack of variance in this variable, the number of produce suppliers that the institution had (*VENDNUM*) was used as a monitoring cost instead. Monitoring costs rise as the number of suppliers used by an institution increases because they have to check more deliveries and approve more invoices.

Institutional and Price Variables

The type of institution was represented in the model as a dummy variable (FOURDUM), identifying four-year institutions. There were no theoretical expectations regarding the

relationship between the status of an institution's local buying program and the following characteristics: type of dining service (dormitory residents or hospital patients, retail cafeteria, catering, and various combinations of these); type of company operating foodservice program (self-operated or contracted); or the ownership type of the institution (public or private). These variables proved to be insignificant in the initial analysis and were dropped from the model.

Four measures of size related to the 2006–2007 academic year were included in the survey (student enrollment, annual food purchasing budget, annual produce purchases, and average number of meals served daily during a normal day). None proved to be significant as continuous variables or as various forms of categorical variables; hence, they were excluded from the final model. This was consistent with Murray's (2005) observation that although it may be easier for a small college with low volume requirements to have an LGP buying program, numerous large universities also have such programs.

We used a pricing exercise to determine foodservice managers' willingness to pay for LGP. They were asked to visualize two identical-looking flats of strawberries and consider the question: "If the flat of regular strawberries costs $10.00, how much would you be willing to pay for the flat of strawberries that was locally grown?" Responses ranged from a low of $9.00 to $20.00 and averaged $12.44; 28% indicated that they would not be willing to pay any premium for the locally grown product. This variable *LOCPRICE* was also included in the final model.

Ordered Logit Model and Results

We used ordered logit analysis to assess the impact of transaction costs, institutional characteristics, and the price proxy *LOCPRICE* on the status of an institution's LGP buying program. The values possible for the LGP buying program status were: 1—no program, 2—developing a program, and 3—operating a program. Because this dependent variable is in the form of an ordinal scale, we used an ordered, or cumulative, logit model to analyze responses. Among our respondents, 28% had LGP buying programs and 22% were developing such programs in 2007; half of the respondents did not have an LGP buying program. The model was estimated using the logistic procedure in SAS with the descending option. With this option, SAS treats the values of *LOCPUR* in a descending order, such that when the ordered logit regression coefficient is estimated, a positive coefficient corresponds to an increase in the value of *LOCPUR*.

The estimation results are displayed in table 2. All of the estimated coefficients are statistically significant at the 0.05 level. The estimated coefficients measure the change in the predicted logged odds of an institution's LGP buying program status *LOCPUR* for a unit change in the independent variables. It is easier to interpret the odds ratios for the estimated coefficients; they are derived by

Table 2. Ordered Logit Regression Coefficient Estimates and Odds Ratios

Variable	Coefficient	Wald Chi-square	p	Odds Ratio
Intercept 3	−7.1053	10.3461	0.0013	
	(2.2090)			
Intercept 2	−4.7066	5.1777	0.0229	
	(2.0684)			
LOCYR	−0.3769	6.6359	0.0100	0.686
	(0.1463)			
VENAPP	3.2371	10.4824	0.0012	25.460
	(0.9998)			
LOCSTAB	−.7431	9.7640	0.0018	0.476
	(0.2378)			
VENDNUM	0.9684	5.3843	0.0203	2.634
	(0.4174)			
PRLOC	0.4867	13.5915	0.0002	1.627
	(0.4867)			
4YRDUM	1.6833	7.0570	0.0079	5.383
	(1.6833)			

exponentiating the estimated coefficients and are displayed in table 2. A positive coefficient means that the odds of observing a higher buying program status rise with a higher value for the independent variable. A negative coefficient has an exponentiated value between 0 and 1, which decreases the odds. For example, the estimated coefficient for *LOCSTAB* is −0.743 and the odds ratio is 0.476. A one-point increase in the importance of stable produce prices decreases the odds of being in a higher LGP buying program category by 0.476 times, holding all other variables constant. Thus, institutions that do not want to bear the negotiation costs associated with unstable product prices are less likely to have LGP buying programs. The odds ratio for *VENAPP* is 25.460; this means that as one goes from institutions without vendor approvals to those requiring such approvals, the odds of having a local buying program is 25.460 times more likely, holding all other variables constant. Institutions that are willing to bear the negotiation costs associated with the vendor approval process are considerably more likely to have LGP buying programs. Similarly, the estimated odds ratio for *VENDNUM*, the number of produce suppliers an institution uses, implies that when the number of suppliers that an institution uses increases by 1 (raising the institution's monitoring costs associated with checking more deliveries and approving more invoices), this increases the odds of having a buying program for LGP by 2.634.

The odds ratio estimate for the estimated coefficient for the price variable *PRLOC* indicates that as the price an institution is willing to pay for locally grown strawberries increases by $1.00, the odds of being in a higher local buying program category are now 1.627 times higher. Thus, the signs for all of the estimated coefficients for the transaction cost variables and the price proxy indicate that institutions willing to bear higher costs are more likely to have LGP buying programs. This seemingly counterintuitive result is discussed in the next section.

The interpretation for the odds ratio estimate for the dummy variable *4YRDUM* is slightly different. Four-year colleges have 5.383 times greater odds of developing or having an LGP buying program, as do community colleges and teaching hospitals, holding all other variables constant. This is understandable; teaching hospitals are more constrained because of their patients' specialized dietary needs. Relative to the other institutions, clientele at community colleges are more price

sensitive; in this study, the community college managers' higher ratings of the importance of inexpensively foodservice prices to their clientele were statistically significant at the 0.05 level.

Discussion and Conclusions

The marginal effects indicated by the preceding logit analysis reveal that colleges and teaching hospitals incur significant transaction costs and a price premium to have an LGP buying program. They are less likely to consider year-round availability of key items and stable product prices to be important and more likely to have vendor approval requirements and more produce suppliers.

These seemingly counterintuitive findings are attributable to attitudinal differences regarding environmental and social values among institutions. The attitudes of the institutions' foodservice managers were measured by asking them to rate the importance of various characteristics on their produce buying decisions, using the same 1 to 7 rating scale. The characteristics were inexpensively priced, certified organic, sustainably produced, locally grown, and grown by a small- or mid-scale producer; summary statistics for these ratings are reported in table 3 by the status of the institutions' LGP buying program. The *F*-statistics were significant at the 0.05 level for all five variables, indicating that there were significant differences in attitudes by the status of the LGP buying programs. Institutions that did not have LGP buying programs had the highest average rating for "inexpensively priced." Also, institutions that did not have LGP buying programs had the lowest average ratings for the importance of each of the production attributes. Scheffe test results indicated that the differences in ratings between institutions without LGP buying programs and those developing LGP programs were significant at the 0.05 level for the price variable and for all four production attributes.

Thus, the largest attitudinal differences are between institutions without LGP buying programs and those developing one. Several foodservice managers that were developing LGP buying programs mentioned that their interest in buying LGP was driven by "doing the right thing" rather than in response to requests from their clientele. They were willing to incur higher transaction costs and pay higher prices in order to purchase produce

Table 3. Average Ratings of Importance of Price and Production Attributes by LGP Buying Status

	Average Importance Rating[a] By LPG Buying Program Status			
Attribute	No Program	Developing Program	Have Program	*F*-statistic[b] (d.f. = 2)
Inexpensively priced	6.15 (1.10)	5.68 (1.00)	5.07 (1.76)	4.27
Certified organic	2.30 (1.68)	4.32 (1.53)	4.03 (1.95)	9.70
Sustainably produced	2.83 (2.12)	4.95 (1.18)	5.88 (1.40)	22.10
Locally grown	3.67 (2.15)	5.00 (1.25)	6.04 (1.45)	13.40
Grown by small- or mid-size producer	2.44 (1.83)	3.89 (2.16)	5.27 (1.76)	14.74

[a]Scheffe test results indicated that the differences in ratings between institutions without local buying programs and those developing local buying programs were significant at the 0.05 level. None of the differences between institutions developing local buying programs and those with local buying programs were significant at the 0.05 level.
[b]*F*-statistic is significant for each attribute at the 0.05 level.

that was produced in a manner that supported their environmental and social values. However, most of the institutions were unwilling to tolerate unreliable produce deliveries, regardless of their environmental and social values.

The LGP share of total produce purchases among those institutions with a buying program averaged 28%. There is potential for this percentage to increase and for some of those institutions that were developing LGP programs to actually implement them. Also, some institutions could change their attitudes and initiate LGP buying programs. Thus, it is not unrealistic to project that LGP purchases by institutions in California could double within five years. However, achieving such growth will require reducing transaction costs. Decreasing the transaction costs associated with having multiple produce suppliers and the vendor approval process will require grower collaboration and improved vertical coordination between growers and produce distributors. The increased volume provided by a larger LGP supplier to an institution could also improve price stability and decrease the price premium paid for LGP. However, significant organizational efforts by growers, distributors, and even policy makers may be required to achieve such structural changes.

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