A Profile of Local Dairy Consumers in the Southeast and the Potential for Dairies to Market Value-Added Products Locally

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With many dairies in the Southeast and all over the United States thinking about started their own bottling and processing plants to produce processed dairy products to sell either directly to consumers or through local market outlets, analysis of the feasibility of these operations must be completed. Before these farmers should invest in such processing ventures they need to be able to determine the size of the potential market for their products. In order to determine the size and value of these markets and thus the feasibility of these dairy projects in the Southeast, an analysis of buyers' preferences for locally produced dairy products was performed. A telephone survey of household shoppers was conducted in the southeastern United States. Analysis of the survey data using economic modeling techniques showed that demographic variables are not dominant factors in determining who purchases local milk products. Instead, both the type of shopper and their attitudes toward local products affect the probability that the consumer will purchase local milk products.

Today Americans are facing a difficult question: With oil prices reaching $147 a barrel, making increasing food prices inevitable because of shipping costs, where are we going to get the farm products that are now being transported from across the country and world? The cost factor associated with the price of oil along with quality and local economy issues have increased the discussion recently about the local-food movement. Even a new term, "locavore," has been coined to describe someone who prefers to eat locally produced food.

As fuel prices increase, the cost associated with transporting food products should significantly affect how food is produced, distributed and purchased. With growing interest by consumers to purchase more local products, many farmers are looking at "produce and market local" strategies. In order to implement these strategies the farmers must be able to determine the characteristics of their local consumers and use that information to determine the size of the market for their products.

Background

At the current time there are not many research articles related to the topic of local food marketing. The closest research to this field is that of the organic food markets. Due to the recent growing interest, a few research articles have begun to reach publication stage. One such article by Zepeda and Li (2006) determined the characteristics of local-food buyers. They estimated a Lancaster-Weinstein model using probit analysis to try and determine these characteristics. One of the difficulties they found was defining the term "local food." The results of their research showed that demographic characteristics are not dominant factors in a consumer's purchase of local food products. They also found that attitudes and behaviors related to food and shopping significantly increase the probability that shoppers buy local food.

A study by Brown (2003) analyzed consumer preferences for locally grown produce in the southeast region of Missouri. She found that consumers don't define "locally grown" as a statewide concept but as a narrower regional concept. In addition, she found that this concept of local was able to cross state lines. The most important factors when purchasing local products were quality and freshness, with most consumers perceiving farmers market produce to be of a higher quality and lower price. Food buyers who were members of an environmental group, had a higher level of education, or had higher income were more likely to pay more for local produce (Brown 2003).

Maynard, Burdine, and Meyer (2003) found that there is market potential for locally produced meat products. Their study found that experience attributes packaged under the "local" label could justify verification programs. They also found that

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restaurants are a potentially receptive outlet for local meats and allow local producers to avoid the barriers to entry of the mainstream grocery outlets.

An institutional buyer's survey was performed by the Leopold Center for Sustainable Agriculture in the Northeast region of Iowa (Chase 2007). Although this study was relatively small in a spatial sense it had some interesting results. The first was that taste and quality were viewed by institutional buyers to be extremely important when making their purchase decisions. This might sound logical but it is not a commonly held contention when discussed by farmers. Forty-one percent of the respondents also thought that marketing locally produced food products would serve as an advantage in appealing to their customers. Fifty-seven percent of the survey respondents indicated that they use locally produced food, and sixty-one percent of the respondents reported that access and/or availability are problems with locally produced food at the institutional wholesale level (Chase 2007).

Data

In order to determine the size of these markets and the feasibility of these dairy projects in the Southeast, an analysis of buyers' preferences for locally produced dairy products was performed. The analysis started by conducting a telephone survey of household shoppers. Data from this survey was collected by the Survey Research Center of The University of Georgia using a computer assisted telephone interview (CATI) system. The telephone interview method that the Survey Research Center used was a random-digit dialing method in order to complete a total of 675 surveys in the Southeastern U.S. The respondents were screened to ensure that they were adults (18 years of age or older). The selection of whom to contact in each household was performed by using the "youngest male, oldest female" technique. Essentially, the interviewer called a phone number and asked to speak to the youngest male 18 years of age or older who lived in the household. If not available, they then asked to speak with the oldest female who lived in the household. This procedure tends to generate more male respondents, which are typically under-represented in sample surveys. A quota system was used to ensure that a sufficient number of respondents were captured in two specific metropolitan markets, Atlanta and Tallahassee, to enable separate analysis of these markets if it was deemed necessary. The Survey Research Center conducted the survey during August and September of 2005. The Survey Research Center obtained 675 completed surveys of those who answered "yes" to purchasing milk in the last four weeks. Missing observations, however, limited the number of usable surveys. Most of the missing observations came from the respondent not wishing to report their income level.

Modeling the Probability of Buying Locally Produced Food

The focus of this study is to identify the characteristics of local-food shoppers. Local food is becoming more important as consumers become more aware of the process by which their food products are produced and as we continue to have food scares each year such as the tomato and salmonella problem this past summer. These national problems increase the focus on our food-marketing system and give local markets more attention. Therefore examining the potential demand for local food requires examining both the product attributes and psycographic and demographic characteristics of consumers.

Given the objectives of the study and the qualitative nature of the data, both summary statistical analysis and econometric analysis were used to analyze the data related to the product attributes and psycographic and demographic characteristics. Significant relationships and characteristics of consumers who prefer to purchase locally produced products were gleaned from cross-tabular analysis. These characteristics include general demographic and psychographic information that was used to obtain a shopper profile. In addition, the probit econometric modeling technique was chosen to determine the significant factors of why consumers would choose to buy locally produced products.

Three separate probit models were used to analyze the data, all based on the following specification:

(1) Willingness To Pay More = f(Type of Store, Shopper Type, Uniqueness of Product, Think About Prod, Feelings About LP 1, Feelings About LP 2, Willing To Drive (yes), Gender, Hispanic, Race, Marital Status, Education Level, Employment Status, Expenditures (food), Income Group, Age Group, Children At Home, Error)

The other two models were specified with the dependent variable being *Interest in Buying Local* and *Willingness to Buy Local. Willingness To Pay More* is the willingness of the respondent to pay more for locally produced milk than other milk (where a yes response = 1). *Interest in Buying Local* is the respondent's interest in buying locally produced milk. The respondent received a one for responses that included stating that they were very interested or interested and a zero otherwise. *Willingness to Buy Local* is the respondent's reaction to being asked whether or not they would be willing to buy locally produced milk products over existing brand milk products if they were competitively priced and offered the same quality. A yes response in this case was set equal to one while a no response equaled a zero.

The independent variables remained the same in all three models and can be divided into three subgroups: Psycographic, Attitudinal and Socioeconomic.

Psycographic

Type of Store: Represents the type of store where the respondent generally purchases their milk. The response Grocery Store/Supermarket = 1; the responses Convenience Store, Warehouse, and Gourmet and Ethnic food stores receive a zero.
Shopper Type: Represents the type of shopper the respondent considers him or herself to be. The responses Value Oriented and Generic Labels = 1; the responses Brand Names, Premium Food Labels, and Health Oriented = 0.

Attitudinal

Uniqueness of Product: Consumers were asked to identify how unique they considered locally produced milk products to be. Somewhat and Very Unique = 1; otherwise 0.
Think About Prod: If the respondent considers how dairy products have been produced when making a purchase they received a 1; otherwise they received a 0.
Feelings About LP: Three variables came from this question. Feelings About LP 1, Feelings About LP 2, and the base being Feelings About LP 3. The first variable indicates whether the respondent feels that locally produced milk is of higher quality than milk produced by larger, commercialized companies. The second variable indicates whether the respondent would buy it just because it was produced locally. The base indicates that the respondent feels there is no difference in the milk produced either way.
Willing To Drive: If the respondent was willing to drive to a working dairy farm market to buy premium fresh milk, this variable was assigned a value of 1; otherwise it was assigned a 0.

Demographic

Gender: Female = 1; Male = 0.
Hispanic: Hispanic origin = 1; otherwise = 0.
Race: White = 1; otherwise = 0.
Marital Status: Married = 1; otherwise = 0
Education Level: College educated or some college = 1; otherwise 0.
Employment Status: Employed = 1; otherwise = 0.
Income Group: This was a continuous variable in $15,000 increments ranging from <$15,000 to >$135,000
Children At Home: If there were children under 18 year of age now living in the household, this variable was set to 1; otherwise it was set to 0.
Expenditures (food): Expenditures on food = 1 when weekly expenditures are between 1 and 25 dollars. Expenditures = 2, 3, 4, 5, 6, 7, 8, and 9 when weekly expenditures equals $26–$50, $51–$75, $76–$100, $101–$125, $126–$150, $151–$175, $176–$200, and $201 and above, respectively.
Age Group: This was a continuous variable that represented the age of the respondent. The respondents were grouped into categories with 10 year age ranges starting with the 18–27 age group.

Results

The first part of this analysis included using cross-tabular calculations performed using the data from the survey to determine a profile of people who prefer to shop locally for their milk products. The data are displayed by the type of shopper each respondent considers him or herself to be with regard to purchasing milk products (Table 1). Brand-name respondents are significantly less likely to express a willingness to purchase a locally produced milk product. This may be explained by assuming that these respondents rely on brand products to alle-

Table 1. Willingness to Purchase and Pay more for Locally Produced Milk.

	A Value-oriented (n = 189)	B Generic labels (n = 113)	C Brand-name items (n = 167)	D Premium food labels (n = 36)	E Health (n = 138)	F Other (n = 36)
Willingness to buy	93%[C]	93%[C]	79%	100%[C]	92%[C]	94%[C]
Willing to Pay a Premium	23%[F]	27%[F]	24%[F]	63%[A-C,EF]	37%[A-D,F]	18%
Interested in Purchasing						
1-Not interested at all	4%	4%	14%	6%	4%	8%
2-Not interested	8%	8%	9%	0%	5%	3%
3-Non-committal	32%	23%	28%	19%	20%	19%
4-Interested	31%	38%	26%	31%	35%	33%
5-Very interested	23%	23%	21%	44%	32%	33%
Don't know	1%	4%	2%	0%	4%	3%
Mean	3.62	3.70	3.33	4.06[A-C,EF]	3.88[A-D]	3.83

[A–F] Indicates that value is significantly different than corresponding value in column A–F.
Note: Columns may not add to 100 percent due to rounding error. Overall average = 3.54.

viate the worry, confusion, or risk of purchasing a product with which they are unfamiliar. When asked if they would be willing to pay more for the product, the premium-food-label segment was significantly more likely to indicate they would pay more than were their other segment counterparts. This is reinforced by the results indicating that the premium-food-label segment is significantly more interested in purchasing this product than are the other segments.

These results indicate that there is a significant interest and willingness to pay for locally produced milk products as indicated by the average interest in purchasing. The mean values of greater than 3.50 suggest that the respondents are interested in purchasing a locally produced milk product. Further inspection reveals that there is more interest in the two targeted markets, Tallahassee and Atlanta, and among the premium-food-label segment than in the other respondent categories.

Analyzing the demographic data provides insight into the consumer that is most interested in purchasing locally produced milk. This profile can be best described as male, between 25–64 years old, with household income exceeding $30,000, college or more education, and with children in the house. This is not to say that females and other respondents falling into other demographic categories are not likely to purchase this product; however, they are less likely to do so.

A locally produced milk product does not appear to be viewed as a unique product. The average rating for this attribute was 3.44 out of five, suggesting the product is considered to be only slightly unique. Interestingly, there were significant differences between the general respondent base and the two targeted markets (Table 2). Tallahassee respondents consider a locally produced milk product to be significantly less unique than do their Atlanta counterparts and other respondents. By segmenting the respondent into shopping categories, it appears that there is less noticeable difference in the uniqueness of a locally produced milk product than is found in the city segment above (Table 3). Again, on inspection of the average uniqueness rating it appears that the respondents indicate that locally produced milk is only slightly unique.

Table 4 provides a demographic profile of the

Table 2. Uniqueness of Locally Produced Milk.

	A Total (n = 587)	B Tallahassee Area (n = 62)	C Atlanta Area (n = 85)
1 - Not at all unique	11%	15%	6%
2	10%	15%	16%
3	27%	31%	29%
4	26%	19%	29%
5 - Very unique	25%	21%	19%
Mean	3.44	3.18 [A&C]	3.39 [A&B]

[A–C] Indicates that value is significantly different than corresponding value in column A–C.
Note: Columns may not add to 100 percent due to rounding error.

Table 3. Uniqueness of Locally Produced Milk.

	A Value oriented (n = 165)	B Generic labels (n = 98)	C Brand name items (n = 145)	D Premium food labels (n = 15)	E Health (n = 120)	F Other (n = 32)
1 - Not at all unique	11%	8%	10%	13%	12%	19%
2	8%	11%	10%	20%	10%	13%
3	30%	33%	28%	13%	23%	22%
4	27%	23%	29%	13%	28%	13%
5 - Very unique	23%	24%	24%	40%	28%	34%
Mean	3.43	3.45	3.48	3.47	3.49	3.31

[A–C] Indicates that value is significantly different than corresponding value in column A–C.
Note: Columns may not add to 100 percent due to rounding error.

survey respondents, whether they consider where their dairy products are produced, and their thoughts on locally produced dairy products. The results provide insight into the propensity to purchase locally produced milk products and respondents' association with statements that most closely describe their perception of locally produced milk. There are some differences by the various demographic categories in the respondents' perception of locally produced milk, but overall they do not perceive a significant difference between locally produced and traditional milk products.

Descriptive statistics of the variables utilized in the probit models are shown in Table 5. They show that 73 percent of the respondents were female, 81 percent of the respondents were white, and 36 percent of the respondents had children at home. The parameter estimates from the probit model are

Table 4. Consideration for Where Dairy Products Are Produced and Feelings About Locally Produce Dairy Products.

Demographic variables	Consider where dairy products are produced	Statement most closely represents feeling about buying milk from a local dairy		
		Higher quality	Buy it because locally produced	No difference
Gender				
Male	29%	27%	33%	40%
Female	35%	24%	37%	39%
Age				
18–24	36%	24%	22%	54%
25–34	38%	24%	32%	44%
35–44	29%	31%	36%	33%
45–54	35%	22%	45%	33%
55–64	38%	29%	34%	37%
65+	29%	20%	35%	45%
Household Income				
Under $15,000	47%	23%	13%	65%
$15,000–under $20,000	61%	29%	38%	33%
$20,000–under $25,000	43%	29%	43%	29%
$25,000–under $30,000	32%	7%	53%	40%
$30,000–under $40,000	24%	33%	30%	37%
$40,000–under $50,000	36%	38%	40%	22%
$50,000–under $60,000	25%	33%	27%	40%
$60,000–under $70,000	41%	43%	26%	31%
$75,000 and over	27%	24%	43%	33%
Education				
< High school degree	44%	9%	38%	53%
High diploma/GED	37%	23%	35%	42%
Some college/technical	30%	24%	33%	43%
College graduate	33%	28%	36%	36%
Post-graduate degree	30%	33%	39%	28%
Race/ethnicity				
White	30%	25%	38%	37%
Black	49%	28%	26%	46%
Asian	20%	0%	0%	100%
American Indian	83%	0%	75%	25%
Multi-racial	42%	37%	37%	26%
Hispanic	52%	14%	43%	43%
Marital status				
Married	30%	25%	37%	37%
Divorced	29%	29%	35%	35%
Separated (small sample)	83%	40%	0%	60%
Widowed	38%	18%	35%	47%
Single	38%	28%	34%	38%
Focused markets				
Tallahassee	22%	26%	42%	32%
Atlanta	34%	33%	31%	36%

Table 5. Descriptive Statistics.

	N	Mean	Std. deviation
Willing to Buy Local	651	.8909	.31196
Willing to Pay More	634	.2729	.44579
Interest in Local Production	649	.5917	.49190
Shopper Type	660	.4576	.49857
Type of Store	674	.8680	.33879
Uniqueness of Product	587	.5128	.50026
Willing to Drive to No	634	.5726	.49510
Willing to Drive to Yes	634	.4274	.49510
Think about Prod Yes	671	.3338	.47193
Think about Prod No	671	.6662	.47193
Feelings L P 1	625	.2512	.43405
Feelings L P 2	625	.3568	.47944
Feelings L P 3	625	.3920	.48859
Income	446	6.2063	2.65509
Marital Status	661	.6293	.48334
Race = White	664	.8087	.39359
Expenditure on Food	625	4.4416	1.98719
Employment Status	656	.5686	.49565
Education Level	667	3.1964	1.14377
Age Group	675	3.8104	1.79916
Have Children at Home	662	.3640	.48153
Not Hispanic	673	.9688	.17400
Gender = Male	675	.2741	.44638
Gender = Female	675	.7259	.44638

shown in Tables 6, 7 and 8 along with the marginal effects of the variables.

The first model that was run with the independent variable "Willing to Buy Local" had three significant variables: Shopper Type, Feelings about LP3, and Education Level (Table 6). Even though most of the individual parameters estimated lacked significance, the overall model was significant at the one-percent level ($\chi^2 = 38.35$, 17df). The marginal effects indicate that if Shopper Type and Education Level are associated with an increased probability of replying "yes" to being willing to buy local products. Feelings about LP3 is associated with a decreased probability of replying "yes" to being willing to buy local products.

The results from the second model are shown in Table 7. This model was run with the independent variable "Willing to Pay More"; the constant was significant, as were three variables: Think about Production Yes, Feelings about LP1, and Feelings about LP2. Even though most of the individual parameters estimated lacked significance, the overall model was significant at the one-percent level ($\chi^2 = 55.33$, 17df). The marginal effects indicate that the

Table 6. Results of Probit Analysis and Marginal Effects on Consumers for the Dependent Variable Willing to Buy Local (N = 336).

Variables	B	M.E.
Type of Store	.040976	.004619
Shopper Type	.765990*	.083586
Uniqueness of Prod	.187478	.020967
Think About Prod Yes	-.238878	-.027800
Feelings About LP 2	.095200	.010289
Feelings About LP 3	-.667517*	-.088246
Willing To Drive (no)	-.177731	-.019543
Gender = Female	.067448	.007606
Not Hispanic	.453632	.069167
Race = White	.035763	.004006
Marital Status	.073399	.008212
Education Level	.203684**	.022426
Employment Status	.017538	.001940
Expenditures (food)	-.811003	-.008929
Income Group	.031659	.003485
Age Group	.051190	.005636
Children At Home	-.012219	-.001347
Constant	.225848	

Think about Production Yes, Feelings about LP1, Feelings About LP2 variables are associated with an increased probability of being willing to pay more for local products.

The third model that was run, with the independent variable "Interest in Buying Local," had five significant variables: Type of Store, Uniqueness of Product, Feelings about LP1, Feelings about LP2, and Willing to Drive to No. Even though most of the individual parameters estimated lacked significance, the overall model was significant at the one-percent level ($\chi^2 = 67.38$, 17df). Table 8 indicates the marginal effects of the Type of Store, Uniqueness of Product, Feelings about LP1, and Feelings about LP2 and shows that they are associated with an increased probability of an increased interest in buying locally produced products. This is consistent with expectations in that when consumers find a product more unique they would have an increased interest in purchasing it. Feelings about LP1 means that the respondent feels the locally produced milk is of higher quality than milk produced by larger, commercialized companies. One would expect the positive marginal effect obtained for this variable. Feelings about LP2 represented the consumers' willingness to buy locally produced milk just because it was produced locally, which is also as expected. Willing to Drive To No is associated with a decreased probability of interest in buying locally produced products. This result is consistent with what would be expected, since consumers in many cases might have to drive more to purchase locally produced products.

Table 7. Results of Probit Analysis and Marginal Effects on Consumers for the Dependent Variable Willing to Pay More (N = 326).

Variables	B	M.E.
Type of Store	.140751	.046383
Shopper Type	.095012	.032359
Uniqueness of Prod	.080833	.027419
Think About Prod Yes	.508882*	.178219
Feelings About LP 1	.928998*	.337327
Feelings About LP 2	.984067*	.343916
Willing To Drive (yes)	.068871	.023416
Gender = Female	-.060712	-.020788
Not Hispanic	-.419117	-.155052
Race = White	.150207	.049699
Marital Status	-.278038	-.096497
Education Level	.009108	.003095
Employment Status	-.209186	-.072394
Expenditures (food)	.031116	.010576
Income Group	.069907	.023760
Age Group	-.035617	-.012105
Children At Home	-.004346	-.001477
Constant	-1.47262*	

* Significant at the .05 level.
** Significant at the .10 level.

Conclusion

The results of this analysis show similar results to previous research related to marketing local products in that general demographic variables seem not to have an affect on consumers' willingness to buy local products, interest in local products, and willingness to pay more for local products. However, responses to attitudinal and psycographic questions show some significance when trying to determine what a consumer's response will be to purchase decisions related to locally produced products. This type of information can be useful in determining the potential size of a market for locally produced dairy products. However, it is limited in this case by the fact that demographic data alone cannot discern whether or not a consumer is more likely to purchase locally produced milk products. Additional research on relationships between the demographic variables and the attitudinal and psycographic variables needs to be performed in order to benefit these types of producers.

References

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Table 8. Results of Probit Analysis and Marginal Effects on Consumers for the Dependent Variable Interest in Buying Local (N = 337).

Variables	B	M.E.
Type of Store	.453870*	.173385
Shopper Type	.095698	.034701
Uniqueness of Prod	.297865*	.108446
Think About Prod Yes	-.001788	-.000649
Feelings About LP 1	.438153*	.151079
Feelings About LP 2	.561588*	.195631
Willing To Drive (no)	-.737248*	-.261931
Gender = Female	-.039809	-.014515
Not Hispanic	.036946	.013521
Race = White	.034300	.012172
Marital Status	-.228977	-.081833
Education Level	-.043514	-.015810
Employment Status	.165273	.060704
Expenditures (food)	.003320	.001206
Income Group	.058829	.021374
Age Group	-.019567	-.007109
Children At Home	-.274935	-.100544
Constant	-.206747	

* Significant at the .05 level.
** Significant at the .10 level.