An Analysis of Consumer Preferences for Delaware Farmer Direct Markets

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Farmer direct markets, including farmers' markets, roadside stands, pick-your-own farms, and tailgate markets, are an important outlet for Delaware agricultural products. These markets offer an alternative for local farmers and small growers to sell their produce directly to the public. This benefits small growers in opening up new markets at which they can obtain higher prices than on the commercial wholesale market, and benefits consumers by providing fresh fruits and vegetables at lower prices (Sommer and Nelson, 1985). Sommer and Wing (1980) found the main reasons why customers shopped at a farmers' market were the food quality, particularly freshness and flavor, followed by price, savings and social atmosphere. Consumers may also purchase local, organically grown, or specialty items not always available in supermarkets. There is also significantly more social interaction at farmer's markets than at nearby supermarkets (Herrick et al., 1981). These attributes combine to make farmer direct markets a unique service for consumers. However, this unique service can possess attributes that can keep consumers from shopping at farmer direct markets. Inconvenient market location, for example, was found to be a major reason consumers did not shop at farmer direct markets (Toensmeyer and Ladzinski, 1981). This was especially true for pick-your-own farms and roadside stands.

Since many farmers and direct market managers lack the resources and experience to compete with supermarkets, it is important for direct market operators to understand the reasons why consumers may chose to purchase produce from farmer direct markets rather than a supermarket. It is also helpful to determine how residents in different consumer market locations such as rural, suburban, cities and towns differ in their preferences concerning farmer direct markets. Therefore, the objective of this study is to determine consumer preferences for various farmer direct market attributes based on the respondents consumer market location.

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Materials and Methods

Data

Data collected for this study came from a survey designed to gather information that will help farmers improve the services they offer in their direct marketing efforts. During the fall of 1995, 10,000 randomly selected Delaware residents were mailed a ten-page survey. Two survey mailings per selected resident, spaced two weeks apart, resulted in a total response rate of 12.9 percent, not counting non-deliverable and non-usable surveys.

The issue of how alternative attributes influence consumers shopping at Delaware farmer direct markets was addressed in the survey using a conjoint measurement technique. Farmer direct markets vary in many aspects, therefore evaluating farmer direct markets involves measuring consumer preferences towards a varying multi-attribute service and product. The traditional approach to preference measurement has been self reports, where respondents are asked directly regarding their feelings or beliefs concerning a product or service (Churchill, 1983). This can present problems when attempting to estimate preferences towards varying multi-attribute products or services. When asked to do so, many respondents find it difficult to articulate which attributes they were using and how they were combining them to form a judgment (Green et al., 1988).

Conjoint analysis is a multivariate technique used specifically to understand how consumers develop preferences for services and products based on the premise that consumers evaluate the utility of a service idea or product (real or hypothetical) by combining the separate amounts of utility provided by each attribute (Anderson,

1986). Conjoint analysis allows the researcher to separately rate each of the attributes at different levels in terms of level of utility derived from that specific attribute. Measuring the amount of utility that each variable contributes to the product or service as a whole allows researchers to gain insight into the correct mix of attribute levels in order to maximize consumers utility. As a multivariate market research technique, conjoint measurement, is particularly well suited for measuring human perceptions and preferences (Green et al., 1988).

Conjoint measurement refers to any decompositional method that estimates the structure of an individual's preferences given the individual's overall evaluation of a set of alternatives that are pre-specified in terms of levels of different attributes (Green and Srinivasan, 1978). By knowing the respondents' choices, and knowing the characteristics of the products or services presented to respondents, these preferences can be decomposed to determine how much utility is associated with each level of each attribute.

Procedure

Products or services are treated as bundles of attributes in conjoint experimentation. These attributes should reflect the key service or product characteristics from which consumers base their preference for the product or service as a whole. While attribute levels correspond to the key characteristics, the attribute levels correspond to the range that these characteristics take. It is therefore necessary to carefully select the major attributes that are most influential in consumer decision-making (Halbrendt, et al., 1994).

The attributes should include those most relevant to potential consumers and those which satisfy the managerial constraints (variables to be manipulated in product design, pricing, or distribution effect) (Cattin and Wittink, 1982). The Delaware farmer direct market's attributes and attribute levels were selected based upon a priori knowledge of these services from previous Cooperative Extension and consumer contact. For this study, the attributes selected are the type of market, the quality and appearance of fresh produce relative to supermarkets, cleanliness of the market, the distance consumers have to travel to shop at the market, and finally produce price level relative to supermarkets. Price, although not technically an attribute of a service or product, is typically included in conjoint analysis.

In conjoint analysis it is also necessary to select appropriate and realistic ranges of attribute levels (Green and Srinivasan, 1978). The seven attributes used in this study including market type; quality, price and appearance of produce; service; cleanliness; and travel distance. Each attribute had multiple levels with market type having six levels, price and travel distance having five levels, cleanliness having four levels, quality and appearance having three levels, and service having two.

Once the attribute and attribute levels had been selected, they were combined using fractional factorial design into hypothetical farmer direct market profiles. This study used a full profile conjoint experiment utilizing orthogonal arrays to generate the smallest statistically efficient design. Respondents were asked to rate a set of hypothetical farmer direct market profiles. Each farm market profile is defined by selecting one level from each attribute. Survey respondents were then asked to rate each attribute using a rating scale from "0" to "10" where:

0 = least preferred combination of direct farm market attribute levels.
10 = most preferred combination of direct farm market attribute levels.

Full factorial design can generate large combinations of the attribute levels. From the attributes and levels selected in this study, there were 10,800 possible farmer direct market profile combinations. The conjoint design used in this study generated 49 hypothetical farmer direct market profiles. However, these were still too numerous for the typical individual to evaluate. Therefore, a pseudo attribute was added to the above design to split the hypothetical farmer direct markets into "blocks" (Green, 1974). With the addition of one hypothetical direct farmer market profile that is common to all blocks, the survey respondents only had to rate the hypothetical farmer direct market profiles within a single block consisting of eight profiles.

Conjoint analysis measures the consumer preferences for a product or service as the additive sum of the utility of each service or product attribute. Consumer preferences for this study can be stated as:

(1) Preferences = *f*(Attribute Utilities)

For the farmer direct market analysis the model can be expressed as:

(2) Rating = *f*(market, quality, price, appearance, service, cleanliness, trip)

where :

rating = preference rating given to the hypothetical farmer direct market by survey respondent

market = type of direct market (open air farmers' market, heated air-conditioned farmers' market, open air roadside stand, heated air-conditioned roadside stand, pick-your-own farm, tailgate market)

quality = fresh produce quality compared to supermarkets (below supermarket, equal to supermarket, above supermarket)

price = market price of fresh produce relative to supermarkets (20% below supermarket prices, 10% below supermarket prices, 20% above supermarket prices, 10% above supermarket prices, equal to supermarket prices)

appearance = fresh produce appearance compared to supermarkets (less than supermarkets, same as supermarkets, better than supermarkets)

service = customer service with large bulky items (loading assistance available, self service)

cleanliness = market cleanliness (clean and sanitary, clean, messy, messy with flies)

travel = travel distance to market (on routine route, 5 extra miles, 10 extra miles, 15 extra miles, 20 extra miles)

The attribute levels chosen for the base level profile consisted of a traditional roadside stand that is messy with flies; located 20 miles from the consumers routine travel route; has prices, quality, and appearance of produce similar to that found in supermarkets; and has self-service for large or bulky items. These levels were chosen based on the following criteria. Roadside stands are the most common type of farmer direct market in Delaware (Delaware Farm Market Directory, 1994). Supermarkets are direct farm markets' largest competitors. Therefore, it is of interest to determine how changes in the levels of direct market price, quality, and appearance compared to supermarkets affect the consumer's preferences. The large number of additional comments concerning the sanitary conditions of Delaware farmer direct markets indicated that a messy market with flies was an appropriate base level for the attribute concerning sanitary conditions.

The data revealed that there were four consumer market location groups consisting of rural residents, suburban residents, small town residents, and city residents. Respondents were segmented by consumer market location, where 20.1 percent of the survey respondents reported residing in rural areas, 52.2 percent reside in a suburb, 14.8 percent reside in small towns, and 12.9 percent reside in cities. This study will examine the participant preferences by consumer market location, and whether those differences are significant between the four consumer market locations.

To deal with the problem of heteroscadastisity, this study uses logistic regression to determine the parameter estimates. The logistic regression is appropriate for limited dependent variable regression estimation, and allows for comparison of alternative attribute levels using odds ratios. Since the proportional odds assumption that all slopes of the original rating scale were equal was rejected, the 0-10 rating scale was collapsed to a binary level where ranges of 0-5 were equal to 0, and 6-10 were equal to 1.

Results and Discussion

This study estimates the individual farmer direct market attribute level odds ratio segmented by consumer market location, and also tests for any significant difference in consumer market location for a given attribute level. The logit model for this study has a predictability of 81 percent and all logit model main effect variables examined in the analysis are significant at the .05 level or better. The odds ratios generated by the logit procedure will be used in presenting the results of this analysis.

Rural, suburban, and small town residents were significantly more likely to rate a roadside stand that is 20 miles from the consumers routine travel route: messy with flies; sells produce with quality, price and appearance equal to that found in supermarkets; offers no assistance with the loading of bulky items; higher than city residents. Heated and air-conditioned roadside stands were more likely to be frequented by consumers residing in rural areas (1.42), suburban areas (1.68),

and cities (2.62) than open air roadside stands (Table 1). Significance tests indicated that consumers residing in rural areas, cities, and suburban areas were significantly more likely to visit a heated and air-conditioned roadside stand than consumers residing in small towns. However, suburban and rural residents were significantly less likely than city residents to visit a heated and air-conditioned roadside stand. Direct market managers of roadside stands could increase the probability of being frequented by consumers, especially those residing in the city, by providing heat and air conditioning for their markets.

Heated and air-conditioned farmers' market attributes also received a higher preference rating compared to the basic roadside stand. Residents form city, suburban, and small town areas were found to be 2.72, 1.54, and 1.41 times more likely to frequent a market of this type, respectively (Table 1). Rural residents were found to be significantly less likely to shop at a heated and air-conditioned farmers' market than city, small town, or suburban residents. Similar to the heated and air conditioned roadside stand, open air farmers' market operators can expect to attract additional consumers to their market by providing heat and air-conditioning. Open air farmers' markets were also found to have a greater probability of being preferred by city (2.57), rural (1.60), and suburban (1.57) residents over a roadside stand (Table 1). Significance tests found that city residents were more likely to shop at an open air farmers' market than those from small towns, suburban areas, and rural areas.

Only city residents reported that they would be more likely (1.67) to prefer a tailgate market over a roadside stand (Table 1). Rural, suburban, and small town residents were approximately 1.74, 1.18, and 1.70 times less likely to visit this type of market. City residents, when compared to rural, small town, and suburban residents, were significantly more likely to favor a tailgate market. Direct marketers operating a tailgate market can expect greater success catering to city residents over all other consumer market locations. They can benefit from this by placing markets in close proximity to city residents. Pick-your-own farms were viewed approximately one and a half to two times less favorable than a roadside stand by city (0.61), suburban (0.68), and rural residents (0.48) (Table 1).

Compared to the roadside stand, all other market types, except for pick-your-own, are viewed more favorable by city residents. Suburban residents preferred farmers' markets over the traditional roadside stand. Rural residents preferred the heated air-conditioned roadside stands, and open air farmer's markets over traditional roadside stands. Small town residents favored only the heated and air-conditioned roadside stand. Using this information, market operators can tailor the type of direct market operation to fit the preferences of the main consumer market locations nearest to them.

Respondents from rural areas (0.31), suburban areas (0.32), small towns (0.33), and city areas (0.42) all reported being two and a half to three times less likely to shop at a direct market when the produce quality is below that found in supermarkets (Table 1). Farmer direct markets having higher quality produce than that found in supermarkets had a positive impact on preferences. However, this impact was of a lesser magnitude than the impact caused by lower quality produce, implying that consumers have a stronger negative attitude concerning low quality produce. Suburban residents, for example, are approximately one and a half times more likely shop at a market with high quality produce but are three times less likely to shop at a market with lower quality. Direct markets that are offering lower quality produce can hope to significantly increase market share by offering produce that is of higher quality than that found at supermarkets.

Changes in consumer preferences due to the appearance of the produce being less than that found in supermarkets had a predictable effect. In this study, residents from all consumer market locations were approximately two times less likely to shop at a market with produce appearance below that found in supermarkets (Table 1). The weight that consumers from different consumer market locations place on appearance however, is of interest. City residents were found to be significantly more likely than small town, rural, and suburban residents to favor a market where the appearance of produce is above that found in supermarkets. The results for consumer preferences for appearance of produce above supermarkets show more variance within the groups. City residents were 2.21 times more likely while suburban

Table 1. Odds Ratio for Consumer Market Locations.

Variable	Relative Importance	------ Odds Ratio ------ Rural	Suburbs	Town	City
Market Type	9.32%				
Heated/AC Roadside Stand		1.420**	1.680****	.906	2.621****
Heated/AC Farmer's Market		.903	1.536****	1.405*	2.719****
Open Air Farmer's Market		1.600***	1.572****	1.244	2.565****
Tailgate Market		.575****	.848*	.589***	1.668**
Pick-Your-Own-Farm		.480****	.684***	.912	.605*
Fresh Produce Quality	15.84%				
Below Supermarket		.307****	.323****	.334***	.423****
Above Supermarket		1.250*	1.488****	1.540***	1.713****
Fresh Produce Appearance	7.75%				
Below Supermarket		.507****	.561****	.546***	.536****
Above Supermarket		1.142	1.242***	1.163	2.211****
Market Service	5.39%				
Bulky Item Loading Assistance		1.606****	1.320****	1.480***	1.601****
Market Cleanliness	25.46%				
Clean		7.504****	8.094****	6.981***	5.634****
Clean and Sanitary		8.875****	7.333****	6.501***	6.562****
Messy		1.281*	1.290**	1.467**	1.098
Travel Distance	16.57%				
Market on Routine Route		4.240****	3.799****	4.759***	5.734****
Special Trip of 5 Miles		2.767****	1.946****	3.286***	2.869****
Special Trip of 10 Miles		1.985****	1.842****	1.820***	1.413
Special Trip of 15 Miles		.897	.997	1.136	.892
Price Level	19.67%				
20% Below Supermarket Prices		2.380****	2.228****	2.040***	2.044****
10% Below Supermarket Prices		2.086****	1.494****	2.100***	1.955****
10% Above Supermarket Prices		.428****	.326****	.265***	.700
20% Above Supermarket Prices		.303****	.238****	.283***	.351****
Total	100%				

Notes: χ^2 Score (87 d.f.) = 7124.132 p = 0.0001
Percent correct predictions 81.0%
N= 7630 (1090 Respondents)
* Significant at the .05 level. ** Significant at the .01level. *** Significant at the .001level. **** Significant at the .0001 level.

residents were 1.24 times more likely to prefer markets with produce having appearance above that found in supermarkets. Once again, by taking into account the consumer market location, direct market operators can significantly increase consumer preference for their produce by ensuring that appearance is above that found in supermarkets.

Residents from all consumer market locations were approximately one and a half times more likely to frequent a farmer direct market which provided assistance in loading bulky items, with no significant differences found to exist between consumer market locations. Results indicate that direct market operators can increase market share by simply providing assistance with the loading of bulky items.

Voluntary comments from respondents indicated sanitary conditions of farmer direct markets in Delaware were an important factor in the consumer decision-making process. The odds ratios stress the importance consumers place on market

cleanliness. Respondents from all consumer market locations were found to be between six to eight times more likely to visit a market that was clean and sanitary over a market that was messy with flies (Table 1). Results for a clean market were similar to a clean and sanitary market with respondents being approximately five to eight times more likely to visit a market of this type. Rural (1.28), suburban (1.29), and small town residents (1.47) were found to be approximately one and a half times more likely to visit a messy market over a messy market with flies. Significance tests between respondent groups found suburban residents were one and a half times more likely than city residents to visit a market that is clean.

Survey participants also viewed travel distance as an important factor influencing their preferences for a farmer direct market. Rural (4.24), suburban (3.79), small town (4.76), and city residents (5.73), reported being from three to five times more likely to frequent a market that is on their routine travel route compared to one that was 20 miles away (Table 1). As the farm market location distance from a consumer's routine travel route increased, the likelihood of frequenting the market decreased significantly. Respondent groups were approximately two to three times more likely to shop at a market 5 miles from their routine route. And approximately two times as likely to prefer a market 10 miles from their routine route compared to the base level of 20 miles from the respondents' routine travel route. Differences between respondent groups indicated that suburban residents were one and a half times more likely than city residents to frequent a market on their routine travel route. Rural and small town residents are approximately one and a half times more likely than suburban residents to favor a market that is 10 miles from their routine travel route. Common sense dictates that direct market operators can increase market share by placing markets close to frequently traveled routes. The results from this study reinforce this and provide a measurement of the weight that consumers place on the location of direct market.

Respondents from all consumer market locations were approximately two times more likely to shop at a direct market having prices 20% below the prices found in supermarkets (Table 1). Rural (2.38) residents are more likely to prefer a market of this type than suburban (2.28), small town (2.04), and city (2.04) residents. Prices 10% below had a similar effect causing rural (2.09), suburban (1.494), small town (2.100), and city (1.95) to favor a market with 10% lower prices. The significance tests between respondent groups showed that both small town and rural residents were significantly more likely to favor a store with 10% lower prices than suburban residents. Direct market profiles having prices that were 10% to 20% higher than supermarkets will be approximately two to four times less likely to be frequented by all respondent groups. Paying close attention to prices will allow a greater market share for farmer direct markets. Direct market operators can take advantage of low overhead costs and lower costs involved in marketing produce to consumers directly. This will allow farmer direct markets to attract consumers with prices lower than supermarkets.

Conclusions

The results of this study indicate several conclusions concerning the attitudes of consumers from different consumer market locations towards Delaware farmer direct markets. First, as indicated by both the odds ratios and voluntary respondent comments, consumers view the cleanliness and sanitary conditions of the farmer direct markets as a major concern. Farmer direct market operators can significantly increase the likelihood of being frequented by consumers in all market locations by making sure that the markets are clean. Respondents indicated that their probability of frequenting a market would be greatly reduced if the quality of fresh produce were below that of a supermarket. Frequency will increase if the quality is above that of a supermarket. While this appears logical, it is of interest to note that the probability associated with lower quality produce is dramatically reduced, while the probability associated with higher quality produce is only slightly increased. Taking this into account, farmer direct market managers should make certain that the quality of their produce is no lower than supermarket quality. Location of markets was also a major factor affecting consumer preferences. Farmers wishing to establish direct markets to increase the profitability of their operation can focus on selecting a location that is as close as possible to highly traveled areas.

Direct market operators can take advantage of low overhead cost and lower costs associated with avoiding middlemen by selling the produce at prices lower than supermarkets. Respondents from all consumer market locations indicated that they would be attracted to a market having prices that are 10 percent below supermarket prices. Finally, by simply providing assistance with the loading of bulky items, direct market managers can attract customers from all market locations. By considering which consumer market locations account for a majority of their customers, direct market managers can tailor the attributes of their operations to provide the product and service that consumers prefer the most. This will enable direct market managers to increase the competitiveness of Delaware farmer direct markets.

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