The Impact of Respondents' Characteristics on Purchasing Decisions

Kristy Kuches, Ulrich C. Toensmeyer, Carl L. German, and Jaime Kuklish

Background

The U.S. fresh produce industry is rapidly growing, with new technologies producing superior fruits and vegetables at more efficient rates. McLaughlin, Park, and Perosio (1997) claim that "the fresh fruit and vegetable industry has been one of the most dynamic in the U.S. food system for the past quarter century." Upon entering the new millennium, consumers' demand for fresh produce should continue to increase if, in fact, it follows past trends. Fresh produce consumption, on a per capita basis, has been increasing for 25 consecutive years (McLaughlin, Park, and Perosio, 1997).

With this growing demand for fresh produce comes an opportunity for farmers to increase their individual profits, specifically, through the use of direct markets. The four main types of farmer direct markets are defined as follows:

(1) Tailgate Market—produce is usually sold by one or more vendors from the back of a truck;

(2) Pick-Your-Own Farm—produce is picked/harvested from a field or orchard by customers;

(3) Roadside Stand/Market—fresh produce is sold from a single-market outlet; and

(4) Farmer's Markets—a collection of independently operated roadside stands at one location.

Farmer direct markets provide a very important link between consumers who continue to search for high-quality produce items at low costs and farmers who continue trying to compete in the produce industry. Further, direct markets allow farmers to sell fresh produce directly to consumers, thus completely bypassing the complex distribution network and providing the farmers with a greater share of profits. Although farmer direct markets will never displace produce sections at supermarkets, they have been and will most likely remain a successful niche market (a small customer target group that is segmented according to specific customer needs) as long as farmers learn how to assess consumers' changing wants and needs. This study is designed to help farmers in making this assessment.

It is also important for direct market operators to understand how residents from different county locations, specifically in Delaware, differ in their attitudes and preferences concerning both fresh produce and farmer direct markets.

Objectives

The objectives of this study were:

(1) to determine consumer attitudes toward farmer-to-consumer-direct markets, by county and state—Delaware;

(2) to utilize demographic variables in order to analyze consumer attitudes and purchasing decisions at the various direct market outlets; and

(3) to make recommendations, based on results, on marketing produce more effectively at direct market outlets.

Data

Data had been previously collected from a consumer mail survey on direct marketing sent out in the fall of 1995 to 10,000 Delaware residents randomly selected through a commercially purchased mailing list. This sample was subdivided by counties in proportion to the population base. After the back-up mailing, 1,209 surveys were returned statewide, with 801 from New Castle County, 195 from Kent County, and 213 from Sussex County. Thus, the statewide response rate was 12 percent, not including unusable returns.

The authors are, respectively, degree with distinction student, professor, and extension marketing specialist, Department of Food and Resource Economics, University of Delaware.

Survey Procedures

The first part of the questionnaire asked respondents various questions about their personal views and preferences concerning farmer direct markets in Delaware. The responses for these questions were either: (1) rated on a contingency valuation scale of 1 to 7; (2) yes, no, do not know, or have no opinion responses; or (3) free-choice responses, in which the respondent checked the most accurate response(s) from those listed.

The second part of the survey questionnaire asked for general demographic characteristics of the respondents, including type of residential area in which they reside; gender; age of both the respondent and his/her spouse; education level completed; race; occupation; and household income.

In this study, tobit or censored regression was used to ascertain the impact of demographic and attitudinal characteristics on factors that affect consumers' purchasing decisions.

Demographic Characteristics of Respondents

Demographic data collected from the survey showed Sussex County respondents to be older than respondents from both New Castle and Kent counties, reflecting the general population differences among the counties. Approximately 42 percent of Sussex County respondents are 60 and older, compared to only 25.6 percent in Kent County and 28.2 percent in New Castle County (Table 1). As far as gender, in all three counties, female respondents are predominant in numbers over males; however, the greatest spread in percentages occurs in New Castle County, where 60.8 percent of respondents are female and only 39.2 percent are male. There are only slight variations with respect to race. Caucasians are the majority for all counties, with each having 90 percent or greater. Sussex County does have more Native American respondents, with about 7 percent, as compared to 2.9 percent in New Castle County and 2.1 percent in Kent County; however, Sussex County has fewer Black/African American respondents, with only 1.5 percent, compared to New Castle County's 4.6 percent and Kent County's 5.2 percent.

Survey results showed that 9.1, 10.3, and 4.8 percent of the respondents were between the ages of 18 and 29 for New Castle, Kent, and Sussex counties, respectively.

The education level of the survey respondents varied by county, with New Castle County residents slightly more educated than Kent and Sussex County respondents. Approximately, 50.4 percent of New Castle County respondents had a college degree or higher, compared to 35.5 and 33.8 percent, respectively, in Kent and Sussex Counties (Table 1). The income distribution of respondents also varied by county, with New Castle County in the lead. Slightly more than 50 percent of New Castle County respondents (by household) indicated making $50,000 or more, while 35.5 percent of Kent County respondents and 29.7 percent of Sussex County respondents made the same claim.

Of the survey respondents, 1.9, 7.2, and 3.8 percent, respectively, have less than a high school education for New Castle, Kent, and Sussex counties. Regarding the specific residential areas of the respondents, survey results by county indicate that, in New Castle County, 70.9 percent reside in suburban areas while, in Kent and Sussex Counties, 35.9 percent and 50.7 percent, respectively, reside in rural areas (Table 1). Statewide, the majority of the respondents claimed to live in suburban areas.

With respect to occupational status, the most frequent response was "retired," with 24.3 percent statewide (Table 1). In Sussex County, 39.3 percent of the respondents was retired, compared to 21.2 percent in New Castle County and 21.4 percent in Kent County. The next highest percentages are for managerial and professional, with 15.8 percent statewide; service employment, with 15.6 percent; and administrative support, with 14.7 percent.

Tobit Model

A tobit or censored regression model was used on question 16 of the Direct Market Survey in order to determine the impact of respondents' demographics and beliefs on such purchasing decisions as farm-like atmosphere, money-back guarantee, graded produce, express checkout, refrigerated displays, locally grown produce, organically grown produce, special events, advertised specials, like to help farmers, canning or freezing, and produce selection. The variables used in the analysis are residential status, age, gender, race, income level, county of residence, state certification, whether the respondent has been disappointed with produce, and whether fruits and vegetables were the main reason for shopping at direct markets.

Table 1. Comparison Demographic Variables of Survey Respondents, by County, Delaware, 1995.

Characteristics	New Castle Survey Results	Kent Survey Results	Sussex Survey Results	State Survey Results
	percent			
Age				
Under 18	N/A	N/A	N/A	N/A
18–29	9.1	10.3	4.8	8.5
30–44	33.8	30.2	25.8	31.8
45–59	28.9	33.9	27.3	29.5
60–74	22.8	21.5	36.4	25.0
75 or older	5.4	4.1	5.7	5.2
Total	100.0	100.0	100.0	100.0
Gender				
Female	60.8	54.4	55.7	58.8
Male	39.2	45.6	44.3	41.2
Total	100.0	100.0	100.0	100.0
Race				
Black/African American	4.6	5.2	1.5	4.1
Asian/Pacific Islander	0.8	1.0	—	0.7
Native American	2.9	2.1	6.8	3.5
White/Caucasian	91.2	90.7	91.7	91.2
Other	0.5	1.0	—	0.5
Total	100.0	100.0	100.0	100.0
Education Level				
Less than High School	1.9	7.2	3.8	3.1
High School Diploma	16.9	21.6	26.7	19.4
Some College	25.9	26.9	26.2	26.1
Associates/Tech Degree	4.9	8.8	9.5	6.4
College Degree	30.7	24.2	24.3	28.5
Post-Graduate Degree	19.7	11.3	9.5	16.5
Total	100.0	100.0	100.0	100.0
Gross Income				
Less than 5,000	0.7	1.1	1.1	0.8
5,000–9,999	1.7	2.8	3.7	2.2
10,000–14,999	3.2	3.3	5.9	3.7
15,000–24,999	7.6	17.1	17.0	10.9
25,000–34,999	15.5	14.4	21.3	16.4
35,000–49,999	20.0	26.0	21.3	21.1
50,000–74,999	28.1	21.5	22.2	26.0
75,000–100,000	14.2	9.9	4.8	11.9
Above 100,000	9.0	3.9	2.7	7.0
Total	100.0	100.0	100.0	100.0

(continued on next page)

Table 1. Comparison Demographic Variables of Survey Respondents, by County, Delaware, 1995.
(continued from previous page)

Characteristics	New Castle Survey Results	Kent Survey Results	Sussex Survey Results	State Survey Results
	percent			
County Residence				
New Castle		66.3	66.3	
Kent		16.7	16.2	
Sussex		17.0	17.5	
Total		100.0	100.0	
Residential Area				
Rural Area	8.0	35.9	50.7	20.1
Suburban Area	70.9	22.6	9.2	52.2
City	14.2	17.9	2.9	12.8
Small Town	6.9	23.6	37.2	14.9
Total	100.0	100.0	100.0	100.0
Occupational Status				
Managerial and Professional (including Engineers and Doctors)	17.7	17.0	7.7	15.8
Health Technologists and Technicians	7.0	7.4	6.6	7.0
Teachers	7.6	5.3	1.5	6.2
Sales	4.5	8.0	7.7	5.7
Administrative Support (including secretarial)	16.0	13.3	11.2	14.7
Service	16.4	14.4	13.8	15.6
Farming	0.3	—	—	0.2
Precision Production, Craft, Repair, Operators, and Laborers	5.6	9.0	6.1	6.3
Retired	21.2	21.4	39.3	24.3
Other	3.7	4.2	6.1	4.2
Total	100.0	100.0	100.0	100.0

Source: Consumer Mail Survey Results and Calculations.

As stated in the previous chapter, this question listed several different factors, which the respondent had to rate on a scale of 1 to 7. The model used to analyze the dependence of the 12 different factors on demographic and attitudinal characteristics is specified as follows:

$$Chi = \alpha + \beta_1 Age + \beta_2 Age2 + \beta_3 Male + \beta_4 Burbs + \beta_5 City + \beta_6 Town + \beta_7 White + \beta_8 Tech + \beta_9 College + \beta_{10} Income2 + \beta_{11} Income3 + \beta_{12} Income4 + \beta_{13} Income5 + \beta_{14} Fruits\&Veg. + \beta_{15} Certified + \beta_{16} Disappointed + \beta_{17} NewCastle + \epsilon,$$

where

Chi = either *Atmosphere, Guarantee, Graded, Express Checkout, Refrigerated Displays, Locally, Organically, Events, Specials, Help, Canning,* or *Selection*;

Age = Age of respondent;

Age2 = Age*Age;

Male = 1 if male and 0 if female;

Burbs = 1 if respondent lives in the suburbs and 0 if otherwise;

City = 1 if respondent lives in the city and 0 if otherwise;

Town = 1 if respondent lives in a small town and 0 if otherwise;

White = 1 if respondent is white and 0 if otherwise;

Tech = 1 if respondent has some college or a technical degree and 0 if otherwise;

College = 1 if respondent has a college degree or higher and 0 if otherwise;

Income2 = 1 if household income is $25,000–34,999 and 0 if otherwise;

Income3 = 1 if household income is $35,000–49,999 and 0 if otherwise;

Income4 = 1 if household income is $50,000–75,000 and 0 if otherwise;

Income5 = 1 if household income is greater than $75,000 and 0 if otherwise;

Fruits&Veg. = 1 if respondent replied that fruits and vegetables are the main reason for their visit to the direct market and 0 if otherwise;

Certified = 1 if the respondent replied that s/he would shop if the direct market was state-certified and 0 if not;

Disappointed = 1 if the respondent has ever been disappointed with the quality of fresh produce from a direct market and 0 if never disappointed;

New Castle = 1 if respondent is from New Castle County and 0 if otherwise; and

ϵ = an independently distributed error term.

Statistical Analysis Software (SAS Institute, Inc.) was used to compute this analysis. The variable was then converted to chi-square whereupon, using tobit, the upper limit was no higher than 6, and the lower was limited to no lower than 0 (results in Table 2). Variables found to be significant at the .05 or lower will be further discussed.

Tobit Results

Farm-Like Atmosphere

The significant variables for the *Atmosphere* model are College and Income5. Thus, those respondents that had a college degree or higher rated a farm-like atmosphere .52 points more importantly than did those respondents with a lower education level. Therefore, a farm-like atmosphere may be more appealing to higher-educated consumers. In addition, respondents with income levels greater than $75,000 rated farm-like atmosphere .86 points more importantly than those respondents in the lower income categories.

Money-Back Guarantees

The significant variables for the *Guarantee* model are White and College. Therefore, white respondents rated money-back guarantees 1.17 points more importantly than non-whites. Further, those respondents with income levels greater than

Table 2. Results from the Tobit Regression Model.

	Parameter Estimates					
Variable	Atmosphere	Guarantee	Graded	Express	Displays	Locally
Intercept	2.9449	.3833	1.336	2.492*	3.449*	2.922*
Age	.0378	-.0110	.0158	.0222	-.0460	-.0757*
Age2	-.0003	.0002	-.0002	-.0002	.0005	.0006
Male	-.4882	-.0524	-.1947	-.0407	-.2194	.3001*
Burbs	.0640	-.1708	-.4280	-.1849	-.3331	.4288
City	.2834	.3210	-.3723	-.1034	-.1616	.5925*
Town	.4693	.3161	.0126	-.2341	.2643	.5796*
White	.0841	1.167*	.5443	.1471	.2819	-.1162
Tech	.2190	.2566	.3050	.1688	.5773*	-.2765
College	.5203*	.9030*	.7283*	.2551*	.8868*	.1600
Income2	.0778	.0804	-.3499	.1481	.0974	-.3142
Income3	.3345	.3208	-.0133	.1913	.3641	.3295
Income4	.4998	.1482	-.0554	.1606	.3110	.5041*
Income5	.8649*	.7361	.4099	.3372	.6459*	.4866
Fruits and Vegetables	-.4642	.6149	.3358	-.0189	.4305	-.5755
Certified	-.3433	.0194	-.4312	.1401	-.9227*	-.2070
Disappointed	-.2821	.0669	.3199	.0538	.1475	.2889
New Castle	.2994	.4584	.4580*	.0688	.2830	.6280*
Variable	Organic	Events	Specials	Help	Canning	Selection
Intercept	4.386*	.8804	2.443*	3.229*	3.814*	3.603
Age	-.0962*	.1171	.0318	.0121	-.0002	-.0331
Age2	.0013*	-.0003	-.0003	-.0001	-.0003	.0003
Male	.3194	-.0632	.0625	.0505	.0635	.0858
Burbs	-.2200	-.3099	-.0961	.1554	.2549	.0102
City	-.1057	.4086	.0724	-.0480	.3378	-.1129
Town	-.0716	.0300	.1093	.0274	.2284	.1862
White	.2257	.8075	.2950	.0876	.3094	-.1068
Tech	-.0222	.3501	.1712	.1751	-.0826	-.1270
College	.1823	.6199	.0584	.2587*	.1985	-.2383*
Income2	.0380	-.2290	-.2071	.0043	-.1883	-.1438
Income3	.2988	.3632	-.1423	-.1031	-.4423*	-.1478
Income4	.6990*	.0126	-.1138	.0325	-.3685*	-.1297
Income5	1.088*	.4461	-.0393	-.0831	-.1657	.0608
Fruits and Vegetables	-.3492	-.1108	.0081	-.6325*	-.2177	.2157
Certified	-.4208	-.4383	-.0933	-.2202	-.1975	-.2145
Disappointed	.4379	.1925	.1814	-.0761	.0660	.0744
New Castle	.4097	.4160	.0352	-.1594	.0535	.0573

* Significant at the .05 level.

Source: Consumer Mail Survey Results and Calculations.

$75,000 rated money-back guarantee .90 points more importantly than the other respondents did.

Graded Produce

For the *Graded* model, the significant variables were College and New Castle. Respondents with a college degree or higher rated graded produce .73 points more importantly than did those with less than a college degree. New Castle County respondents also rated graded produce more importantly than respondents in other counties did, by .46 points.

Express Checkout

The significant variable for the *Express* model is College. Respondents with a college education or higher rated express checkout .25 points more importantly than did respondents with less than a college degree.

Refrigerated Displays

The significant variables for the *Display* model are Tech, College, Income5, and Certified. Thus, respondents with a technical two-year degree rated refrigerated displays .58 points more importantly than did those respondents with a high school diploma or less. And those respondents with a college degree or higher rated refrigerated displays .89 points more importantly than those with lower education levels did. Respondents with income levels greater than $75,000 rated this variable as .65 points more important than did respondents falling in lower income categories. Additionally, those respondents who would shop at a direct market if it were state-certified are .92 points less impressed with refrigerated displays than were respondents who did not care if the market was state-certified or not.

Locally Grown

For the *Locally* model, the significant variables are Age, Male, City, Town, Income4, and New Castle. Most shoppers seemed to prefer locally grown produce, indicating a major market potential for farmers. In general, as the age of the respondent increased, the importance rating of locally grown produce increased. In addition, male respondents rated this variable as .30 points more important than did females. Respondents who resided in the city rated locally grown produce .59 points more importantly than did respondents residing in a rural area, while respondents residing in small towns rated it .58 points more importantly than rural area respondents did. Furthermore, respondents earning $50,000–74,999 a year rated locally grown produce more importantly than did respondents in different income level categories. Lastly, New Castle County respondents viewed locally grown produce .63 points more importantly than did both Kent and Sussex County respondents, indicating the need to label locally grown produce, especially in New Castle County markets.

Organically Grown Produce

The significant variables for the *Organic* model are Age, Age2, Income4, and Income5. Organically grown produce is become increasingly more popular as consumers become more safety- and health-conscious. Generally, however, as respondents/consumers become older, they tend to place less importance on organically grown produce, indicating great potential for marketing organics toward the younger to middle-age groups. Likewise, respondents in the upper-income groups viewed organically grown products as more important. These groups further have the discretionary income to pay for the higher-priced organic products and, thus, would be more willing to buy. Farmers need to take advantage of this group of people and learn how to better target them.

Special Events

There are no significant variables for the *Events* model. Generally, this is not an important factor in influencing individuals' purchasing decisions.

Advertised Specials

There are no significant variables for the *Specials* model.

Like to Help Farmers

The significant variables for the *Help* model are College, and Fruits and Vegetables. Thus, respondents with a college degree or higher rated helping farmers .26 points more importantly than did respondents with less than a college degree.

Those respondents who reported that fruits and vegetables were the main reason for their visit rated helping farmers .63 points less importantly than did respondents who reported not visiting mainly for fruits and vegetables.

Canning and Freezing

For the *Canning* model, the significant variables are Income3 and Income4. Thus, respondents in the middle-income categories rated canning and freezing less importantly than did respondents in the other income categories.

Produce Selection

The significant variable for the *Selection* model is College. Therefore, respondents with a college degree or higher rated produce selection as .24 points less important than did respondents who had less than a college degree.

Conclusions and Recommendations

Tobit Conclusions

Each purchasing decision model had different significant variables. The tobit regression model was used to determine the impact of respondents demographic makeup on their purchasing decisions so that farmers could best analyze the most important factors. For the *Atmosphere* model, the significant variables were College and Income5, which means that those respondents with a college degree or higher and those with income levels greater than $75,000 rated farm-like atmosphere more importantly. The significant variables for the *Locally* model were Age, Male, City, Town, Income4, and New Castle. Therefore, as age increased, ranking of importance of locally grown produce increased. In addition, males, residents who reside in cities and small towns, and New Castle County respondents all placed higher importance on produce that is locally grown. Lastly, for the *Help* model, the significant variables were College, and Fruits and Vegetables. Thus, respondents with a college degree or higher rated liking to help farmers more importantly than did respondents with less than a college degree. And respondents who reported that fruits and vegetables were the main reason for their visits rated helping farmers as less important than did respondents who reported the opposite.

Recommendations

In order for farmer direct markets to continue experiencing growth, farmers must evaluate consumers' changing needs and preferences because consumers seek new products and markets with concurrent changes in incomes and lifestyles. In addition to being constantly changing, consumer preferences vary depending on several different (and also changing) factors, including residential area, age, income level, location, number of children, and marital status, to name a few. Farmers, then, must begin to target these individual market segments and to cater their marketing strategies to each unique segment. For example, females from Sussex County were more interested in buying locally grown produce. Whereas, New Castle County residents who were in the lower age categories were more interested in organic produce. Since farmers do not have the necessary finances or time requirements to conduct surveys and to study these consumer attitudes, this study was designed to help them in making these assessments.

As of now, there is great profit potential for Delaware farmers to operate direct markets as niche markets. However, as farmers begin to move beyond traditional farming roles and to start venturing into marketing and wholesaling roles of their own commodities, there is even greater potential. The future *is* plentiful for farmer direct market operators.

References

Gallons, James, U.C. Toensmeyer, and J. Richard Bacon. 1997. "Farmer to Consumer Direct Marketing: An Analysis of Consumer Preferences in Delaware." University of Delaware.

McLaughlin, Park, and Perosio. 1997. "Marketing and Performance Benchmarks for the Fresh Produce Industry." Produce Marketing Association: Food Industry Management, Cornell University. October.