Predicting Willingness-to-Pay a Premium for Organically Grown Fresh Produce

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Consumers were surveyed at various grocery retail establishments in New Jersey to provide opinions on organic produce. The objective of this study was to empirically evaluate which demographic characteristics cause consumers to be more likely to pay a premium to obtain organically grown produce. The results indicate that females, those with higher annual incomes, younger individuals, and those who usually or always purchase organic produce are all more likely to pay a premium for organic produce. The results also indicate that the likelihood of paying a premium for organic produce decreases with the number of individuals living in the household.

Introduction

The market for organic foods is one of the fastest-growing agricultural segments of the economy. A nationwide study shows that sales from the organic food industry are nearing $3 billion a year and are currently growing at an annual rate of more than 20 percent (McEnery, 1996). While organic produce was predominately sold through direct marketing facilities as recently as 1990, it has since become commonplace in grocery chain stores and supermarkets. Organically grown produce is typically sold for a premium price over conventionally grown produce. However, returns to growers are dictated by the total supply, consumer demand, and the available organic outlets (Klonsky, Tourte, and Chaney, 1993).

The defining characteristic of organic agriculture is the absence of synthetic chemical pesticides. This attribute addresses the strong risk aversion that the majority of American consumers have been shown to have to pesticide residues (Zellner and Degner, 1989; Zind, 1990; Burgess et al., 1989; Govindasamy, Italia, and Liptak, 1997; Byrne, Gempesaw, and Toensmeyer, 1991; Misra, Huang, and Ott, 1991). Furthermore, in an altruistic sense, significant concerns about pesticide damage to wildlife, farm workers, and the environment—which bolster support for reduced pesticide use for produce—also have been documented (Weaver, Evans, and Luloff, 1992).

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When pest control does become necessary in organic agriculture, natural pesticides and biological controls can help to decrease crop damage and short-run economic losses. If used in conjunction with crop diversification, rotation, and cultural practices, organic methods of pest control customarily limit disease and insect damage to economically acceptable levels (Klonsky, Tourte, and Chaney, 1993). In comparison to conventional agriculture, however, organic production is often quite labor-intensive and can result in greater produce losses to disease and insects. Estes and Smith (1996) found only a casual link between willingness-to-pay and the cosmetic appearance of organic produce. This result suggests that the most important motivation that consumers exhibit when purchasing organic produce is a sensitivity to their health and safety rather than to other quality characteristics of produce.

Despite rapid growth in output and sales, organic production is still relatively small when compared to conventionally grown produce (Greene, 1991). Furthermore, the majority of consumers still have not begun to purchase organic produce regularly, even though they have indicated serious concern regarding pesticide residues on fresh produce (Goldman and Clancy, 1991). While some organic demand studies have been undertaken in the past, the market for organic produce has quickly evolved in recent years. Increased awareness of organic produce necessitates new research to document the current dynamics of the organic market. Because of the high population density, and the heterogeneous ethnicity and sociodemographic mix, the sample location of this study—the Northeastern United States—allowed for the collection of a data set with a high degree

of cross-sectional variation. Thus, specific consumer characteristics could be isolated in order to decompose the marginal effects of demographic variables, attitudes, and risk perceptions on the willingness-to-pay a premium for organic foods. In contrast to existing research, the paper incorporates a higher number of explanatory variables into the logit framework. A higher number of significant variables are also uncovered relative to previous studies.

Background

Many factors have been found to affect the willingness-to-pay for reduced pesticide produce. In most cases, gender and income are among the most significant determinants. Consumers who frequently purchase organic produce have been found to be less concerned about cosmetic surface blemishes, more concerned about pesticide use, and less concerned about the retail price of fresh produce (Goldman and Clancy, 1991). In general, while income is usually found to be significant in estimating willingness-to-pay for pesticide risk reduction, conflicting findings have been reported. Most studies have found that willingness-to-pay for food risk reduction increases with income (Elnagheeb and Jordan, 1990; van Ravenswaay and Hoehn, 1991). Additionally, Misra, Huang and Ott (1991), and Underhill and Figueroa (1996) both reported that higher-earning individuals were the most likely to pay a premium for certified organic produce. However, Buzby, Ready, and Skees (1995) detected that income and willingness-to-pay for reduced pesticide grapefruit were inversely related. Many studies also have found that food safety concerns decrease as income increases (Buzby, Ready, and Skees, 1995; Byrne, Gempesaw, and Toensmeyer, 1991; Dunlap and Beus, 1992; Jussaume and Judson, 1992). These findings may suggest that higher-earning households have a higher degree of confidence in the safety of the food supply; however, these households have and do frequently make use of their greater financial resources to purchase foods that they believe are safer or of higher quality.

Weaver, Evans, and Luloff (1992) reported that 56 percent of consumers indicated a willingness-to-pay of at least a 10 percent premium to obtain pesticide-free tomatoes. Only 19 percent of the sample indicated that they were unwilling to pay any premium at all. Similarly, Huang (1993) reported that the majority of consumers indicated a willingness-to-pay of up to 10 percent more for organically grown produce. A gender significance, which showed females to be more likely than males to pay a premium for organic produce, also was found. Huang noted that females and households with children were more likely to have higher risk aversions toward pesticide residues than their counterparts were. Groff, Kreider, and Toensmeyer (1993) also reported that females were more likely than males to place a higher value on organic produce than on conventionally grown produce. Ott and Maligaya (1989) found that females, college graduates, and shoppers over 50 years of age were all more concerned with pesticide use in agriculture. Byrne, Gempesaw, and Toensmeyer (1991) also found that females and lower-earning households were more likely to have high concerns over pesticide usage. They also found that, in contrast to Ott and Maligaya, persons with at least a bachelor's degree were less likely to have risk aversions to pesticide residues when compared to those with lower levels of education.

Misra, Huang, and Ott (1991) documented a negative correlation between education and willingness-to-pay for chemical residue-free produce. Analogously, Malone (1990), and Zellner and Degner (1989) both reported results which show that higher-educated consumers exhibit a lower willingness-to-pay for safer food. Groff, Kreider, and Toensmeyer (1993) determined that those with lower levels of education were more likely to feel that organically grown produce was superior to produce grown conventionally.

Conflicting marginal age effects also have been reported. Whereas Underhill and Figueroa (1996), and Buzby, Ready, and Skees (1995) found age to be inversely correlated with willingness-to-pay for organic produce, Misra, Huang, and Ott (1991) found the opposite to be true. Zellner and Degner (1989) also reported findings which suggest that older consumers are more likely to pay higher prices for higher levels of food safety. Ott and Maligaya (1989) also found that, despite high aversions to pesticide residues, willingness-to-purchase alternative agricultural produce decreased when willingness-to-accept cosmetic defects were considered.

The inconsistencies of past findings may be the result of changes within the growing market for organically grown produce. New and current data are warranted to provide a clearer picture of the present structure of the market.

Methodology

The logit model was selected as the regression method in this analysis because its asymptotic characteristic constrains the predicted probabilities to a range of 0 to 1. The logit model is commonly used in settings where the dependent variable is binary. Because the data source provided individual, rather than grouped, observations, the common estimation method of choice was the maximum likelihood method (Gujarati, 1992). Among the beneficial characteristics of maximum likelihood estimation are consistent and asymptotically efficient parameter estimates (Pindyck and Rubinfeld, 1991).

The empirical model assumes that the probability of observing willingness-to-pay a premium for organic produce, P_i, is dependent on a vector of independent variables (X_{ij}) associated with consumer i and variable j, and a vector of unknown parameters β. The likelihood of observing the dependent variable was tested as a function of variables, which included sociodemographic and consumption characteristics.

$$(1)\quad P_i = F(Z_i) = F(\alpha + \beta X_i) = 1/[\,1 + \exp(-Z_i)],$$

where:

$F(Z_i)$ = the value of the logistic cumulative density function associated with each possible value of the underlying index Z_i;

P_i = the probability that an individual would be willing to pay at least a 10 percent premium to obtain organically grown produce given the independent variables X_is; and

α = the intercept.

And βX_i is a linear combination of independent variables so that

$$(2)\quad Z_I = \log[P_i/(1-P_i)] = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n + \varepsilon,$$

where:

i = 1,2,. . . ,n are observations;

Z_i = the unobserved index level or the log odds of choice for the ith observation;

X_n = the nth explanatory variable for the ith observation;

β = the parameters to be estimated; and

ε = the error or disturbance term.

The dependent variable Z_i in the above equation is the logarithm of the probability that a particular choice will be made. The parameter estimates do not directly represent the effect of the independent variables. For the continuous variables, the changes in the probability P_i that $y_i = 1$ brought by the independent variable X_{ij} is given by:

$$(3)\quad (\partial P_i / \partial X_{ij}) = [\beta_j \exp(-\beta X_{ij})] / [1+\exp(-\beta X_{ij})]^2 .$$

However, when the independent variables are also qualitative in nature as is the case of the explanatory variables in this model, $\partial P_i/\partial X_{ij}$ does not exist in that X_{ij} is discrete, which means that it does not vary continuously. In this case, probability changes must be obtained by evaluating P_i at the alternative values of X_{ij}. Probability changes are then determined by

$$(4)\quad (\partial P_i / \partial X_{ij}) = P_i(Y_i : X_{ij} = 1) - P_i(Y_i : X_{ij} = 0).$$

The following model was developed to predict the likelihood that a participant would be willing to pay a 10 percent premium for organically grown produce. The model was tested under the specification:

$$\begin{aligned}\text{PAY-ORG} = {} & \beta_0 + \beta_1 \text{Male} + \beta_2 \text{Age1} + \beta_3 \text{Age2} + \\ & \beta_4 \text{Age3} + \beta_5 \text{Income1} + \beta_6 \text{Income2} \\ & + \beta_7 \text{Income3} + \beta_8 \text{Education2} + \beta_9 \\ & \text{Education3} + \beta_{10} \text{Shop-Many} + \beta_{11} \\ & \text{Kids} + \beta_{12} \text{Visit} + \beta_{13} \text{Organic} + \beta_{14} \\ & \text{Heard-of-IPM} + \beta_{15} \text{Risk} + \beta_{16} \text{Garden} + \beta_{17} \text{Media1} + \beta_{18} \text{Media2} + \beta_{19} \\ & \text{Hsize} + \beta_{20} \text{Prime} + \beta_{21} \text{Trynew} + \beta_{22} \\ & \text{Negative} + \varepsilon,\end{aligned}$$

where:

Pay-Org = 1 if the individual was willing to pay a 10 percent premium to obtain organically grown produce and 0 otherwise;

Male = 1 if the individual is male and 0 otherwise;

Age1 = 1 if the individual is under 36 years of age and 0 otherwise;

Age2 = 1 if the individual is between 36 to 50 years of age and 0 otherwise;

Age3 = 1 if the individual is between 51 to 65 years of age and 0 otherwise;

Income1 = 1 if the household income was $29,999 or less and 0 otherwise;

Income2 = 1 if the household income was between $30,000 and $49,999 and 0 otherwise;

Income3 = 1 if the household income was between $50,000 and $69,999 and 0 otherwise;

Education2=1 if highest level of education attained by the participant was above that of a high school degree but lower than a Master's degree and 0 otherwise;

Education3= 1 if the participant had attained at least a Master's degree and 0 otherwise;

Shop-many= 1 if the participant regularly visits many grocery stores in order to purchase advertised specials and 0 otherwise;

Kids = 1 if one or more children under the age of 17 reside in the household and 0 otherwise;

Visit = 1 if the individual indicated that they had visited a farmer's market within the past five years and 0 otherwise;

Organic = 1 if the individual usually or always purchases organic produce and 0 otherwise;

Heard-of-IPM = 1 if the individual had knowledge of IPM prior to taking the survey and 0 otherwise;

Risk = 1 if the participant believed that the use of synthetic pesticide posed a very serious health risk and 0 otherwise;

Garden = 1 if fruits and vegetables were grown for consumption at the household and 0 otherwise;

Media1 = 1 if the participant indicated that they regularly made use of food advertisements and 0 otherwise;

Media2 = 1 if the participant indicated that they regularly made use of media reports on food safety and 0 otherwise;

Hsize = the number of individuals residing in the household;

Prime = 1 if the individual is the primary food purchaser of the household and 0 otherwise;

Try-New = 1 if participant classified themselves as among the very first to try newly introduced food products and 0 otherwise; and

Negative = 1 if the individual believed that the use of pesticides had a negative effect on the environment and 0 otherwise.

For estimation purposes, one classification was eliminated from each group of variables to prevent perfect collinearity. Females, higher-income households, and those with high risk aversions toward synthetic pesticides were initially expected to exhibit a greater willingness-to-pay a premium for organic produce.

Data Description

The data for this analysis were collected from a consumer survey conducted by Rutgers Cooperative Extension. The survey was administered at five grocery retailers throughout New Jersey and was completed in March 1997. The retail locations included three corporate supermarkets of various sizes, one independent supermarket, and a privately owned direct market establishment. The survey was conducted during both weekend and weekday periods throughout the morning and afternoon hours. Respondents were approached at random while entering the retail establishment. To minimize bias, the study was presented to participants as a "survey of consumers of fresh vegetables" with no mention of pesticides or organically grown produce made prior to handing out the questionnaire. Partici-

pants took home the survey packet and then returned the completed questionnaire by mail in postage-paid return envelopes. In total, 408 questionnaires were distributed to prospective respondents, and 291 completed surveys were returned by mail, yielding a response rate of 71 percent. Topics in the survey questionnaire were based on an amalgamation of several surveys developed for assessing the demand for organic produce. In addition to attitudes and preferences, the questionnaire included items relating to demographic information such as age, gender, income, education, and household size. Questions related to consumer risk perceptions and the premium price that consumers would be willing to pay for organic produce were a primary focus of the survey. In administering the questionnaire, the major food purchaser for the household was encouraged to be the study participant. Before distribution, the survey was pre-tested by a group of randomly selected individuals. The pre-tested surveys were not included in the final data set.

In addition to data on direct consumer response to organically grown produce, questions were also included to ascertain perceptions of pesticide use and pesticide concern levels. Of the 291 participants that responded, 60 percent felt that pesticides posed a very serious risk to human health, and 37 percent felt that pesticides were somewhat hazardous while only 3 percent felt that they were not hazardous. Approximately 55 percent believed that conventional produce was generally safe to consume while 44 percent were unsure or disagreed. Similarly, 58 percent of the respondents believed that there was a significant difference in the safety of consuming conventional and organically grown produce. Only 10 percent believed that there was no difference in the safety of conventional and pesticide residue-free agriculture while 32 percent were unsure. The majority of respondents (66 percent) indicated that they believed the use of synthetic pesticides had a negative effect on the environment while 26 percent were unsure and only 9 percent disagreed.

Collectively, the survey participants responded favorably toward organically grown produce. Approximately 36 percent indicated that they would switch supermarkets to be able to purchase organic produce. Interestingly, only 20 percent of the sample reported that they "never" purchase organic produce. Additionally, 66 percent of the participants reported that they would purchase organic produce if it were more readily available, and 67 percent indicated a willingness-to-purchase organic produce if it were cheaper. Of the 283 respondents who replied to the willingness-to-pay questions, 35 percent of the respondents indicated that they were willing to pay at least a 10 percent premium for organic produce while 46 percent reported that they were willing to pay a premium less than that amount. Approximately 19 percent indicated that they would not pay a premium to obtain organically grown produce.

A descriptive tabulation of the explanatory variables used in this analysis is presented in Table 1. Approximately 66 percent of respondents were female, and 83 percent had completed at least some college. About 58 percent of the participants were 49 years of age or below while approximately 37 percent of the respondents had annual household incomes of less than $39,999. Approximately 33 percent purchased groceries for children who lived in their household. Roughly 15 percent of the respondents were single; 78 percent were married or widowed; and 7 percent were separated or divorced. About 13 percent lived in rural areas while 8 percent lived in urban areas and 79 percent lived in suburban areas.

Empirical Results

The maximum likelihood estimates for willingness-to-pay a premium are displayed in Table 2. The model exhibited a McFadden's R^2 statistic of 0.30, which is reasonable for a cross-sectional sample. The dependent variable (PAY-ORG) was coded as 1 for those willing to pay at least a 10 percent premium for organic produce and 0 otherwise. The calculated chi-square statistic clearly rejected the null hypothesis that all the coefficients of the explanatory variables were 0 at the 0.0001 level of significance. The predictive success of the model is presented in Table 3. Overall, 74 percent of the observations were correctly identified.

The gender variable was significant at the 0.10 level and was negative as expected. Consistent with the results of previous studies (Huang (1993); Groff, Kreider, and Toensmeyer (1993); Ott and Maligaya (1989); and Byrne, Gempesaw, and Toensmeyer (1991)), males were 12 percent

Table 1. Descriptive Tabulation of Explanatory Variables.[a]

Variable		Frequency	Mean	Standard Deviation
Gender				
(Male)	Male	100	0.344	0.4757
	Female*	191	0.656	0.4757
Age				
(Age1)	Less than 36 years of age*	68	0.234	0.4239
(Age2)	36–50 years of age	103	0.354	0.4790
(Age3)	51–65 years of age	69	0.237	0.4260
(Age4)	Over 65 years of age	51	0.175	0.3808
Annual Household Income				
(Income1)	$29,999 or less	48	0.165	0.3718
(Income2)	$30,000–$49,999	58	0.199	0.4001
(Income3)	$50,000–$69,999	58	0.199	0.4001
(Income4)	$70,000 or more*	127	0.436	0.4968
Education				
(Education1)	High School Degree*	43	0.148	0.3555
(Education2)	Some College—Some Graduate School	169	0.581	0.4942
(Education3)	Master's or Doctoral Degree	79	0.271	0.4455
Do you regularly shop at more than one food store?				
(Shop-Many)	Yes	113	0.388	0.4882
	No*	178	0.612	0.4882
Are there children residing in the household?				
(Kids)	Yes	97	0.333	0.4722
	No*	194	0.667	0.4722
Have you visited a farmer's market in the past five years?				
(Visit)	Yes	257	0.883	0.3218
	No*	34	0.117	0.3218
Do you usually or always purchase organically grown fruits and vegetables when shopping for fresh produce?				
(Organic)	Yes	99	0.340	0.4746
	No*	192	0.660	0.4746
Have you heard or read any news report about Integrated Pest Management (IPM) prior to taking part in this survey?				
(Heard-of-IPM)	Yes	94	0.323	0.4684
	No*	197	0.677	0.4684
Do you believe residues from pesticide pose a very serious hazard?				
(Risk)	Yes	175	0.601	0.4905
	No	116	0.399	0.4905
Do you grow fruits or vegetables at home?				
(Garden)	Yes	97	0.333	0.4722
	No*	194	0.667	0.4722
Do you usually make use of food advertisements?				
(Media1)	Yes	64	0.220	0.4149
	No*	227	0.780	0.4149
Do you usually make use of media reports on food safety?				
(Media2)	Yes	119	0.409	0.4925
	No*	172	0.591	0.4925
Household Size				
(Hsize)	Number of individuals in the household	291	2.369	
Are you the primary household grocery shopper?				
(Prime)	Yes	244	0.838	0.3686
	No*	47	0.162	0.3686
Are you among the first to try newly introduced food products?				
(Try-New)	Yes	79	0.271	0.4455
	No*	212	0.729	0.4455
Do you think the use of synthetic pesticide has a negative effect on the environment?				
(Negative)	Yes	193	0.663	0.4734
	No*	98	0.337	0.4734

[a] An asterisk refers to category that was omitted in the logit analysis to prevent perfect collinearity.

Table 2. Estimation Results.[a]

Variable	Estimate	Standard Error	Change in Probability
Intercept	-1.6713	1.0935	
Male*	-0.6528	0.3726	-0.1203
Age3**	1.2962	0.6301	0.2820
Age2***	1.8093	0.6491	0.3766
Age1***	2.3702	0.6429	0.5169
Income1*	-1.0044	0.5778	-0.1630
Income2***	-1.8059	0.5137	-0.2612
Income3	-0.5355	0.4248	-0.0957
Education2*	-0.9036	0.4988	-0.1801
Education3*	-1.0394	0.5592	-0.1781
Shop-many	-0.0841	0.3612	-0.0162
Kids	0.6863	0.5044	0.1397
Visit	-0.0017	0.5462	-0.0003
Organic***	2.1513	0.3508	0.4499
Heard-of-IPM***	0.9835	0.3440	0.2039
Risk	0.1230	0.3507	0.0238
Garden	0.4979	0.3463	0.1002
Media1	-0.2815	0.4264	-0.0526
Media2**	1.1015	0.5078	0.2464
Hsize**	-0.4835	0.1977	-0.0827
Prime	0.0938	0.4525	0.0179
Try-New**	0.7202	0.3459	0.1495
Negative	0.3745	0.3698	0.0705

[a] McFadden's R^2 is 0.30; chi-square statistic testing the global null hypothesis that all betas = 0: 114.184***; ratio of nonzero observations to the total number of observations is 0.343; * is significant at the .10 level; ** is significant at the .05 level; and *** is significant at the .01 level.

Table 3. Predictive Accuracy of Logit Model.[a]

		Predicted		
		0	1	Correct
Actual	0	159	44	159/203
	1	32	56	56/88

[a] Number of correct predictions: 215.

less likely to pay a 10 percent premium for organic produce. The results of Buzby, Ready, and Skees (1995), and Zellner and Degner (1989)—consistent with the results of Underhill and Figueroa (1996)—indicated that all three of the included age variables were more willing to pay the premium than the oldest age group was. The explanatory age variables (AGE1, AGE2, AGE3) were all statistically significant when compared to the oldest category (AGE4). Together, the three income variables suggest that willingness-to-pay a premium is greater for those with annual incomes over $70,000. These findings support those of Misra, Huang, and Ott (1991), and Underhill and Figueroa (1996). Households earning less than $30,000 annually were 16 percent less likely to pay a 10 percent premium for organic produce than those earning at least $70,000 were. Similarly, those with incomes between $30,000 and $49,000 were found to be 26 percent less likely to pay the premium for organically grown produce than the highest income group was.

Those under 36 years of age were approximately 52 percent more likely to pay a premium for organically grown produce than those over 65 were. Similarly, those between the ages 36 and 50 were 38 percent more likely to pay the premium and those between the ages of 51 and 65 were 28 percent more likely to pay the premium than those over the age of 65 were. The fact that older individuals are less likely to pay higher prices for organic produce may be indicative of a number of causes. It may suggest that older individuals have a more restrictive diet or are less likely to deviate from their routine diet out of force of habit. Additionally, individuals who are retired may also be earning less than other age groups, and therefore, the difference in willingness-to-pay across age groups may result from differences in income.

The two educational categories (EDUCATION2 and EDUCATION3) were both found to be less willing to pay the premium for organic produce when compared to the lowest education group (EDUCATION1). Those who had completed some college or attained bachelor's degrees were 18 percent less likely to pay a premium for organically grown produce than those who had not attended college were. Those who had completed at least some graduate school were also 18 percent less likely to pay the premium when compared to those who had not attended college. These findings are consistent with those of Misra, Huang, and Ott (1991), Malone (1990), and Zellner and Degner (1989). Possible implications suggest that less-educated consumers may exaggerate the true risks of pesticide usage or higher-educated respondents have a higher degree of confidence in produce safety standards.

As expected, the dummy variable denoting those who regularly purchased organic produce (ORGANIC) was highly significant in predicting those who would pay a premium. While this finding was intuitive, it confirms Goldman and Clancy's (1991) findings that those who often purchase organic produce are less concerned about price when they shop for produce than other shoppers are. Overall, organic customers were 45 percent more likely to pay the 10 percent premium than those who did not regularly purchase organic produce were.

Willingness-to-pay a premium for organic produce was found to decrease with household size. When evaluated at its mean, a continuous variable denoting household size indicated that the likelihood of paying the premium decreased by 8 percent for each additional person residing in the household. This finding appears consistent with the marginal effect of income in that larger households generally have less discretionary income per person than smaller households do.

A significant variable also indicated that those who had knowledge of integrated pest management methods were 20 percent more likely to pay the 10 percent premium for organic produce. Those who indicated that they were among the first to try newly introduced food products were also 15 percent more likely to pay a premium for organic produce. While these two variables are not typical demographic categorizations, they help to illustrate possible avenues to solicit potential organic customers. Those who frequently made use of media reports concerning food safety were 25 percent more likely to pay the premium for organically grown produce.

A series of variables was used to test for interaction effects between different demographic variables. In total, 32 combinations of gender, income, age, education, and regional setting were tested, yielding no significant variables. The interaction dummy variables were subsequently removed from the final model specification.

Conclusions

As the share of organically grown produce in the U.S. food supply continues to increase, additional research will allow food marketers to target specific consumer segments that are willing to pay a premium for organic fruits and vegetables. The results of this study suggest that the majority of consumers would be willing to pay a premium to obtain organic produce and that certain sociodemographic characteristics do impact the willingness-to-pay for organic produce. From the findings we can construct a profile of the household most likely to purchase organically grown produce at a premium price. Specifically, smaller- and higher-earning households would be more likely to exhibit a higher willingness-to-pay for organic produce. These findings are also consistent because smaller households will have lower expenses, on average, than larger households will. Younger households in which females do the majority of the food purchasing also appear to be among the most likely to pay a 10 percent premium for organic produce. The typical household, which is most likely to pay a premium for organic

produce, considers itself knowledgeable of alternative agriculture, such as IPM, and usually or always purchases organic produce. This finding may illustrate a potential challenge for organic producers as it suggests that the premium may be an obstacle for attracting those who do not currently purchase organic produce on a frequent basis. The results also suggest that those who are most likely to purchase organic produce for a premium exhibit concern over food safety topics by reading food safety reports in the media and have a high willingness to try new food products.

Together, each of the significant variables, exclusive of education, create a highly consistent picture of the ideal organic target household. While the marginal estimates for education seem to conflict with the estimated signs of the other explanatory variables, they do support earlier findings that strongly suggest that education and willingness-to-pay for pesticide-reduced produce are inversely related. Because of this disparity, it may be more advantageous to target prospective organic consumers on the basis of income, age, and household size rather than education. The fact that older consumers and larger households were both found to negatively contribute to the willingness-to-pay a premium for organic produce may be a reflection of differences in household incomes. For instance, increasing household sizes will normally result in lower household-per-capita incomes, and beyond a peak between the ages of 45 to 55, income typically declines.

Overall, areas in which the local economy is able to support higher incomes and in which the average family size is only moderate may be the most successful target areas for organic producers. The highly developed consumer markets in the Northeastern United States as well as the suburban areas surrounding major cities may offer the highest concentration of consumers who are most likely to pay a premium for organically grown fresh produce. This analysis supplements several earlier studies of the demand for organic produce; however, it provides a more current picture of a rapidly changing agricultural sector in a region with one of the highest income levels and population densities in the country. As the organic produce market expands, public perception and awareness change as well. The identification of consumer characteristics that influence the likelihood of willingness-to-pay for organic produce will be valuable as the market continues its growth.

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