Setting Eco-Label Standards in the Fresh Organic Vegetable Market of Northeast Arkansas

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This study uses consumer-intercept interviews at farmers markets and organic produce retail stores in northeast Arkansas to determine the variables that influence eco-label use in organic produce markets. The results indicate that females, consumers with higher annual incomes, those who believe the use of pesticides has a negative impact on health and the environment, and those who usually purchase organic produce are all more likely to use eco-labels in purchasing organic produce. The findings also suggest a direct relationship between income levels and marginal probability of eco-label use. The result of this study provides a current picture of the major determinants that influence eco-label use among consumers, which will be valuable as the USDA proposed organic standards are implemented in the market.

Organic agriculture is of growing importance to the agriculture sector of a number of countries including the USA. It has come to represent a significant portion of the US food system with estimated growth rates that exceed 20 percent annually (Markle, 1997; McEnery, 1996). The increase in growth has attracted supermarket chains, food manufacturers, natural-foods grocery stores, and mail-order and Internet retailers to enter the organic-produce market. Paralleling the growing demand is the rise in consumer concerns with food safety and standards, and the negative environmental impact of conventional agriculture, including pesticide residue, genetically modified organisms (GMOs), hormones, and antibiotics present in food (*FMI/Prevention, 1994; FMI/Hartman Group, 1997*). The organic-market growth has also meant the evolution of regulation of organic production and label standards to assure consumer confidence. An organic or eco-label is a label or logo on a product that gives consumers information about the environmental, agricultural, or social impacts of what they buy, which in turn can help consumers make more informed choices in the marketplace. It also indicates to the consumer that a product was produced using certain production methods. In other words, an organic label is a *process claim* rather than a product claim. It is not surprising that a team of scientists appointed by the USDA in 1980 concluded that there was no universally accepted definition of "organic farming" (*USDA* ,1980). However, the general concept of organically grown produce refers to food that has not been treated with preservatives, hormones, or antibiotics and that has been grown without pesticides or artificial fertilizers in soil whose humus content is increased by the additions of organic matter and whose mineral content is increased by the application of natural mineral fertilizers; etc. (Rodale, 1972).

Though only a small percentage of US farmers are currently organic producers, consumers demand for organically produced food and fiber products provides new market opportunities for limited-resource farmers. Fresh vegetables sold in northeast Arkansas must meet minimum USDA quality standards and be labeled according to a uniform comparative standard of requirements. However, throughout northeast Arkansas, organic fresh vegetables are marketed with labels different from USDA requirements. The surge in consumer demand for organic products has therefore created new interest from the public sector for reliable and comprehensive information on grading and label standards. The absence of unified grading and label standards has forced the private sector—including non-governmental organizations (NGOs)—to take the initiative to develop the markets and labels for organic products. For example, the International Federation of Organic Agriculture Movements (IFOAM)—an NGO that promotes organic agriculture internationally—and Codex have established guidelines that have been widely adopted for the production, processing, labeling, and marketing of organically produced foods. These guidelines maintain evolving "input lists" of acceptable inputs for organic production, processing aids, and

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label standards. However, organic producers, processors, and other private organizations in many countries lack the resources and training to effectively draw up material or input lists to be used in the guidelines for setting label standards. The challenge the USDA faces is to design a unified organic or eco-label and grading standard for the organic product market.

Whether producers intend to sell organic products locally or nationally, reliable label and other market information is difficult to obtain (Smith 1995). Indeed, previous studies have indicated that consumers purchase organic produce because these products are perceived as containing fewer pesticides, higher nutritional value, and greater environmental health benefits (Smith 1995; Wilkins and Hillers, 1994; Goldman and Clancy 1991). However, other studies indicate that pesticide presence in fresh produce is not high (FDA. 1999; Organic Produce, 1998), and in some situations may actually reduce health risks by preventing the growth of harmful organisms including molds that produce toxic substances (Newsome, 1990). Organic proponents suggest that organic produce are safer because they have lower levels of pesticide residues. While some studies have examined the impact of point-of-purchase (POP) label promotion and the public's willingness to pay premiums for organic produce (Reicks, Splett, and Fishman 1999; Govindasamy and Italia, 1999), there is virtually no systematic production or market-survey data being collected with which to assess the factors determing eco-label use among consumers for organic produce. In particular, no projections for eco-label use for organic produce in northeast Arkansas has been made.

The campaign by environmental, consumer, and farm groups persuaded the US congress to pass the Organic Foods Production Act in the 1990 Farm Bill (Larkin,1991). The Act ordered the USDA to set certification standards for organically grown products. On December 16, 1997 the USDA Agricultural Marketing Service proposed rules for a National Organic Program (USDA Agricultural Marketing Service, 1997). The proposal includes national standards for production and handling, a National List of approved synthetic substances, a certification program, a program for accrediting certifiers, labeling requirements, enforcement provisions, and rules for importing equivalent products. A new USDA seal was the only permissible marker. However, the definition of *organic* in the proposed national organic standards lacked the holistic approach central to organic practices. The proposed rules took a "reductionist" approach to organic food production that eliminates key concepts such as the health of the agro-ecosystem and biodiversity on the farm. The USDA received more than 270,000 objections and comments on the proposed rules (Natural Foods Merchandiser, 1998).

Table 1 shows the USDA proposed rule. The intent of the USDA proposal is to ensure that organically produced agricultural products are consistently labeled to aid consumers in selection of organic products and to prevent labeling abuses. The proposed labeling standards also sets forth labeling requirements for organic agricultural products and products with organic ingredients based on their percentage of organic composition.

For each labeling category the proposal establishes what "organic" terms and references can and cannot be displayed on a product package's principal display panel, information panel, ingredient statement, and on other package panels. Finally, it proposes a new USDA organic seal or shield and regulations for display of the USDA seal and display of the seals, logos, or other identifying marks of certifying agents.

There has been an increase in organic agriculture research by USDA in recent years, but even so the contribution is minimal compared to overall agriculture research (e.g., less than 0.01 percent of the US Department of Agriculture research budget is directed to organic agriculture). While some organic-demand studies have been undertaken in the past (Govindasamy and Italia, 1999; McEnery, 1996; Estes and Smith 1996; Goldman and Clancy, 1991; Underhill and Figueroa, 1996; Buzby, Ready, and Skees, 1995; Groff, Kreider, and Toensmeyer, 1993) the market for organic produce has evolved quickly in recent years. Increased awareness of organic produce necessitates new research to document the current dynamics of the organic market. The lack of extensive formal organic research combined with the highly site-specific nature of organic agriculture suggests that it would be most advantageous for farmers and local institutions themselves to participate in locally based applied field research to identify guidelines needed for grading and label standards for locally produced organic products.

Methodology

In assessing the extent to which market participants (producers, retailers, and consumers) in northeast Arkansas use labels in selecting fresh organic produce, respondents provided a "Yes" or "No" answer to questions about whether or not they rely on labels to sell or buy fresh organic produce. In analyzing their choices, maximum-likelihood logit estimation, which is based on the cumulative logistic probability function, was used. The maximum-likelihood logit model is commonly used for binary dependent variables such as "Yes" and "No" and it assures consistency and asymptotic normality of parameter estimates for large samples (Capps and Kramer, 1985; Pindyck and Rubinfeld, 1991). This empirical model assumes that the probability of using labels to select fresh organic produce, P_i, is

Table 1: USDA Proposed Organic Product Labeling Standards.

Labeling Category	Principal Display Panel	Information Panel	Ingredient Statement	Other Package Panels
"100 percent Organic" (Entirely organic; whole, raw or processed product)	"100% percent Organic" USDA Seal and Certifying agent seal(s)	"100 Organic" Certifying agent name (required); business address, tele. # (optional)	If multi-ingredient product, identify each ingredient as "organic"	"100 percent Organic" USDA Seal and Certifying agent seal(s)
"Organic" (95% or more organic ingredients)	"Organic" USDA Seal and Certifying agent seal(s)	"X % Organic Ingredients" Certifying agent name (required); business address, tele. # (optional)	Identify organic ingredients as "organic"	"Organic" USDA Seal and Certifying agent seal(s)
"Made with Organic (specified ingredients)" (50 to 95% organic ingredients)	"Made with organic (specified ingredients)" Certifying agent seal of final product handler *Prohibited: USDA Seal*	"X % Organic Ingredients" Certifying agent name (required); business address, tele. # (optional) *Prohibited: USDA Seal*	Identify organic ingredients as "organic"	"Made with organic (specified ingredients)" Certifying agent seal of final product handler *Prohibited: USDA Seal*
Less-than 50% Organic Ingredients (49% or less organic ingredients)	Prohibited: Any reference to organic content of product *Prohibited: USDA Seal & Certifying agent seal*	"X % Organic Ingredients" *Prohibited: USDA Seal & Certifying agent seal*	Identify organic ingredients as "organic"	Prohibited: Any reference to organic content of product *Prohibited: USDA Seal & Certifying agent seal*

Source: USDA 1997. Section 205.300–310.

dependent on a vector of independent variables (X_{ij}) associated with consumer i and variable j, and a vector of unknown parameters.

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

Where $F(Z_i)$ = value of the logistic function associated with each Z_i index; P_i = the probability that ith consumer will use labels to select fresh organic produce given the observed level of X_i; and α = the intercept.

An appropriate regression estimate of equation 1, given (0,1) dependent variables is the logarithm estimate of the odds that a choice P_i will be made given X_i (Pindyck and Rubinfeld, 1991). Using Z_i as a dependent variable, this can be shown in a linear combination of independent variables as

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

where i = 1, 2, . . . ,n observations; Z_i = the log odd of choice for the ith observation; X_n = the nth explanatory variable for the ith observation; β = the parameter to be estimated; and ε = the error or disturbance term.

The cumulative logistic probability model that can estimate the log of the odds that a particular decision will be made yields large sample properties of consistency and asymptotic normality of the parameter estimates, allowing conventional tests of significance to be applied. In predicting the likelihood that a consumer will use an eco-label to select fresh organic produce, the dependent variable ECO-LABEL was used as a function of organic consumption behavior (OrgVar) and socioeconomic (SocVar) characteristics in the model specifications:

(3) $\text{ECO-LABEL} = \beta_0 \sum_{k=1}^{n} \beta_k \mathbf{OrgVar} + \sum_{k=1}^{n} \beta_k \mathbf{SocVar} + \varepsilon$

The explanatory organic consumption behavior and socioeconomic variables that were hypothesized to influence equation 3 are defined in Table 2.

Data Description

The hypotheses were derived through customer-intercept interviews conducted during weekends from June through September 1999. The project investigator believed that accurate description of consumer use of eco-labels in organic produce purchases must precede thoughtful research analysis; therefore the focus of the consumer survey was both descriptive and analytical. The survey was administered at nine privately owned organic or "natural" produce stores and five farmers' markets selected from 12 agricultural districts in the Mississippi Delta area of Arkansas. The 12 agricultural districts selected were Clay, Crittenden, Cross, Craighead, Greene, Mississippi, Monroe, Lee, Poinsett, Phillips, Randolph, and St. Francis counties. Two cities, Little Rock and Memphis, were also included in the sample because they possess households with diverse socioeconomic backgrounds and have markets for organic produce.

The intercept-interview procedures and questions were pilot-tested at an organic produce store and a farmer's market to assess customers' ability to answer questions and the length of time needed to complete the questionnaire. Following the pilot-test, the questions and interviewing procedures were revised slightly. The customer-intercept interviews used in the study took less than one minute. Customers entering organic produce stores and farmers' markets were selected at random and given a survey questionnaire to be completed at home and a postage-paid envelope for return of the completed questionnaire. The intercept interview distributed 512 questionnaires, 236 or 46 percent completed questionnaire were returned, and 212 or 41 percent were usable. The primary questions used in the survey focused on consumer use of eco-labels and their risk perceptions for organic produce purchases. The interview also gathered socioeconomic information such as gender, education, age and income levels.

Health-conscious individuals, highly educated households, and those with high risk aversions toward synthetic pesticides were initially expected to exhibit a greater willingness to use eco-labels in their selection of organic produce (Goldman and Clancy, 1991; Piedra, Schupp, and Montgomery, 1996; Govindasamy, Italia and Liptak, 1997). Label use was also expected to be higher among females (Food Marketing Institute, 1990; Nayga, 1996). Although other studies have failed to show increased label use with increased age—because older respondents may be more informed about nutrition due to past experiences (Guthrie et al., 1995; Bender and Derby, 1995)—this study expected older and retired respondents to be more

Table 2 Explanatory Variables used in the Model

Variable	Description (Definition)
Dependent Variable	
Eco-Label	= if the individual uses labels to select fresh organic product 1= yes;0 = No
Independent Variables	
Organic Consumption Behavior Variables (OrgVar)	
Organic (org)	= 1 if individual usually or always purchase organic produce and 0 otherwise
Label (lbl)	= 1 if individual usually uses organic label in buying and 0 otherwise
100% Organic	= 1 if individual selects labels displaying 100% organic and 0 otherwise
95% or more	= 1 if individual selects labels displaying 95% or more organic 0 otherwise
95% or less	= 1 if individual selects labels displaying 95% organic or less, 0 otherwise
USDA Seal	= 1 if individual usually buys organic produce with US Seal, 0 otherwise
Agent Seal	= 1 if individual usually buys organic produce with agent seal 0 otherwise
Local	= 1 if individual prefers locally produced organic produce and 0 otherwise
Producer	= 1 if individual usually buys produced organic produce from a known producer and 0 otherwise
Visit	= 1 if individual had visited an organic store/market within the 2 years
Health	= 1 if individual believes that the use of pesticides and herbicides poses a serious health risk and 0 otherwise
Environment	= 1 if individual believes that the use of pesticides and herbicides has a negative effect on the environment and 0 otherwise
Socioeconomic Variables SocVar	
Consumer	= 1 if the individual is a consumer and 0 otherwise
Farmer	= 1 if the individual is farmer and 0 otherwise
Retailer	= 1 if the individual is a retailer and 0 otherwise
Gender (FEMALE)	Respondent is female = 1; otherwise = 0
Education 1	= 1 if respondent education is less than high school; 0 otherwise
Education 2	= 1 if respondent has high school education and 0 otherwise
Education 3	= 1 if respondent has post-high school education and 0 otherwise
Age (AGE1)	= if the individual is under 36 years of age and 0 otherwise
(AGE2)	= if the individual is between 36 to 50 years of age and 0 otherwise
(AGE3)	= if the individual is between 51 to 65 years of age and 0 otherwise
Low Income	= 1 if the household income was $29,999 or less and 0 otherwise
Mid-Income	= 1 if the household income was $30,000-$49,999 and otherwise
High Income	= 1 if the household income was greater than $50,000 and 0 otherwise
Household	= 1 if household has one or more child and 0 otherwise
Buyer	= if respondent is the primary food buyer of the household and 0 otherwise

Table 3. Frequencies and Description of Explanatory Variables.

Variable	Response	Frequency	Percentage	Std. Dev.
Do you usually or always buy organic produce?				
Organic	Yes	68	0.32	0.4734
	No*	144	0.68	0.4734
Do you usually read labels before you buy organic produce?				
Label	Yes	87	0.41	0.4682
	No*	125	0.59	0.4682
Do you usually selects labels displaying 100% organic?				
100% Organic	Yes	112	0.53	0.3684
	No*	100	0.47	0.3684
Do you usually selects organic produce with USDA Seal?				
USDA Seal	Yes	36	0.17	0.4725
	No	176	0.83	0.4725
Do you usually selects organic produce with Private Seal?				
Agent (private) Seal	Yes	89	0.42	0.4822
	No	123	0.58	0.4822
Do usually selects organic produce from a known producer?				
Producer	Yes	66	0.31	0.4013
	No*	146	0.69	0.4013
Do usually buy locally produced organic produce?				
Local	Yes	70	0.33	0.4116
	No*	142	0.67	0.4116
Have you visited an organic store in the past 2 years?				
Visit	Yes	180	0.85	0.3654
	No*	32	0.15	0.3651
Do you think the use of pesticides pose serious health risks?				
Health	Yes	121	0.57	0.4867
	No*	91	0.43	0.4867
Do you think the use of pesticides has negative impact on the environment?				
Environment	Yes	129	0.61	0.4912
	No*	83	0.39	0.4912
Are you the primary household grocery shopper?				
Buyer	Yes	167	0.79	0.3753
	No*	45	0.21	0.3753
Gender	Female	142	0.67	0.4684
	Male*	70	0.33	0.4684
Age1	Less than 35 yeas of age*	47	0.22	0.4193
Age2	35-65 years	127	0.60	0.4518
Age3	Over 65 years	38	0.18	0.3763
Education				
Education 1	Less than high school education*	17	0.08	0.3152
Education 2	High School Degree	34	0.16	0.3976
Education 3	Post High School education	161	0.76	0.4932
Income				
Low Income	29,999 or less*	30	0.14	0.3851
Mid-Income	30,000 to 49,999	61	0.29	0.4023
High Income	Over 50,000	121	0.57	0.4562

*omitted from analysis

likely to use eco-labels due to the availability of time to concentrate on health issues (Grossman, 1972). It was also initially assumed that eco-label reading would be more prevalent for respondents who usually buy organic produce. On the other hand, these respondents may already know the label standards for the organic produce that they buy and may not need to read eco-labels. Therefore, the sign for the LABEL variable was considered indeterminate.

A descriptive summary of the explanatory variables used in the study is presented in Table 3. Approximately 32 percent of the survey respondents indicated they usually or always purchase organic produce. Of the 212 participants who responded, 58 percent indicated that pesticides posed a serious risk to human health and 28 percent felt that pesticides were dangerous, while 14 percent said they posed no health concerns.

Empirical Results

Estimates of the logit analysis for eco-label use are shown in Table 4. The dependent variable ECO-

Table 4. Eco-label Use Model Estimation Results.[a]

Variable	Estimate	Marginal Probability	Standard Error
Constant	0.9748		0.9821
Organic Consumption Behavior (OrgVar)			
ORGANIC*	2.0122	0.4813	0.4514
LABEL*	0.7123	0.6322	0.4313
100% ORGANIC*	0.9153	0.4805	0.3507
95% OR MORE***	0.2236	0.2732	0.3233
95% OR LESS***	0.0637	0.0827	0.5336
USDA SEAL***	0.1264	0.0179	0.3461
AGENT SEAL**	0.4837	0.3863	0.3617
LOCAL**	0.5156	0.2842	0.4523
PRODUCER**	0.0641	0.0918	0.4248
VISIT***	1.0263	0.2179	0.5344
HEALTH (HLTH)**	0.5823	0.3766	0.4987
ENVIRONMENT**	0.3632	0.3701	0.3689
BUYER***	0.3327	0.2452	0.4287
Socioeconomic SocVar			
GENDER (FEMALE)*	1.6331	0.4169	0.6332
AGE2**	0.6572	0.3708	0.5472
AGE3***	0.7325	0.3924	0.6321
EDUCATION2***	0.3125	0.2323	0.4138
EDUCATION3**	-0.1976	0.1944	0.5327
MID-INCOME**	0.2782	0.1876	0.3678
HIGH INCOME***	0.9347	0.2448	0.4355

[a]McFadden's R^2 is 0.235. Percentage of correct predictions 79.3
The ratio of non-zero observations to the total number of observations is 0.725
* is significant at 0.01 level
** is significant at 0.05 level
*** is significant at 0.10 level.

LABEL was coded as 1 for consumers who use eco-labels in selecting or purchasing organic produce.

Among the categorical variables analyzed, the ORGANIC variable had the highest estimate and marginal probability in predicting eco-level use in the model. This implies that respondents who usually buy organic produce were significantly more likely to use or read eco-labels. The important point here is that almost one-half of the respondents who usually buy organic produce perceive that eco-labels must be displayed on organic produce because eco-labels provide them with assurance and confidence information on the organic produce they buy. The result supports similar findings reported in other studies that suggests that the most important motivation that consumers exhibit when purchasing organic produce is sensitivity to their health and safety rather than to price (Estes and Smith, 1996; Goldman and Clancy, 1991). The LABEL variable was also positive and significant, implying that consumers who usually read eco-labels before buying organic produce were 63 percent more likely to rely on or use eco-labels in their selection process. This result also supports findings from another study in which 78 percent of the respondents who reported nutritional use said they read labels (Schupp, Gillespie, and Reed, 1998). The high rate of eco-labels reading among respondents who usually purchase organic produce is likely indicative of the lack of common label standards in the organic industry, the interest in how organic products are produced, and what conforms to their view of the classification and requirements for organic produce.

The HEALTH and ENVIRONMENT variables were positive and significant; indeed, respondents who believed the use of pesticides has a negative impact on health and the environment were 37 percent more likely to read eco-labels. Although the intercept interview was not designed to capture the motivation of the respondents, the potential reason hypothesized was their belief that the use of pesticides would in fact lead to poor organic-production practices. This would be consistent with the arguments advanced by opponents of pesticides use to prevent pesticides use in organic production because of the rise in consumer concerns with food safety and standards, the negative environmental impact of pesticide residues on organic produce (Govindasamy and Italia, 1999; *FMI/Hartman Group, 1997;* Govindasamy, Italia and Liptak, 1997; Piedra, Schupp, and Montgomery, 1996; Buzby, Ready, and Skees, 1995; *FMI/Prevention, 1994;* Weaver, Fans, and Luloff, 1992 Goldman and Clancy, 1991), and the absence of unified and certified eco-label standards.

The variables LOCAL and PRODUCER were estimated with the hypothesized positive sign and were significant at the 0.05 level. The result indicates that respondents who usually buy locally produced organic produce are 28 percent more likely to use eco-labels in their selection process. A possible explanation for the significance of the LOCAL variable is that respondents are concerned about the origin of the organic produce they buy and prefer to be provided with the needed information, an outcome consistent with the results of previous study (Govindasamy, Italia, and Thatch, 1998). However, respondents who usually select organic produce from a known producer were only 9 percent more likely to read eco-labels. The implication is that respondents' past experiences with known producers may have provided them with the needed confidence and information in the production process. The AGENCY SEAL estimate is higher and more significant than the USDA seal. The interpretation is that northeast Arkansas consumers were 39 percent more likely to rely on private seal (AGENCY SEAL) and only 2 percent more likely to use the proposed USDA seal to select their organic produce. A possible explanation for the high rate of private label use among the respondents is likely indicative that organic produce is sold in northeast Arkansas market with private labels or seals that are different from USDA's, or that northeast Arkansas consumers have more confidence in the private organic certification process than in USDA certification requirements.

The coefficient for FEMALE gender was positive and significant as expected, with the interpretation that women are 48 percent more likely than men to use eco-labels in their selection of organic produce, an outcome consistent with the results of previous studies (Food Marketing Institute, 1990; Nayga, 1996). The high rate of eco-label reading among females is likely indicative of the emphasis on meal preparation by women who are usually homemakers (Guthrie et al., 1995; Douglas, 1976).

The explanatory AGE2 and AGE3 variables were all positive and statistically significant when

compared to the youngest category (AGE1). This indicates that older respondents were more likely to read eco-labels than younger ones. A possible explanation for the positive sign may be that AGE2 consumers are more concerned about structuring their diets to avoid potential sources of illness (Hinson et al, 1998), and that AGE3 consumers have more time available to concentrate on health issues (Schupp, Gillespie, and Reed, 1998; Grossman, 1972). However, the literature review of other studies in which age was a variable indicated conflicting results (Guthrie et al., 1995; Bender and Derby, 1995).

The INCOME variable was significant at the one-percent level and was positive, as expected. Households earning $30,000-$49,999, and those earning over $50,000 were 19 and 25 percent more likely to use eco-labels for organic produce purchase, respectively. Furthermore, Table 4 shows a direct relationship between income levels and marginal probability of eco-label use—i.e., as income increases the marginal probability of eco-label use increases. In general, while income is usually found to be significant in estimating eco-label use, conflicting findings have been reported. The findings from this study are consistent with results from other studies showing that households with higher incomes are most likely users of nutritional labels (*Fresh Trends*, 1996; Piedra, Schupp, and Montgomery, 1996; Underhill and Figueroa, 1996; Guthrie et al., 1995); however, findings from other studies show that households with family incomes of $60,000 and higher are less likely to read labels (Schupp, Gillespies, and Reed, 1998).

The education coefficients declined progressively as education attainment increased. The EDUCATION2 variable was estimated to be positive and significant, indicating that respondents with only a high-school education were 23 percent more likely to read or use eco-labels than those with a post-high-school education. A potential explanation for this result may be that respondents with lower levels of education were more likely to feel that organically grown produce was superior to conventional produce, a finding consistent with Groff, Kreider and Toensmeyer (1993). The negative EDUCATION3 estimate was not expected. The result indicates that respondents with a post-high-school education were 19 percent less likely to use or read eco-labels in their selection of organic produce. One possible explanation is that the higher-educated respondents have a higher degree of confidence in organic produce safety standards than less-educated respondents. More-educated respondents may also be less likely to have risk aversions to pesticides residues in organic produce when compared to those with lower levels of education (Ott and Maligaya, 1989).

Summary and Implications

The result of this study suggests that a majority of organic produce consumers use eco-label standards to purchase their organic produce and that certain socio-demographic characteristics and consumption behaviors do influence the use of eco-labels in the organic market. A profile of households with certain consumption behaviors most likely to use eco-labels in purchasing organic produce can be constructed from the findings.

Specifically, households that rely on eco-labels when purchasing organic produce are most likely to exhibit consumption behaviors including usually buying organic produce, the belief that pesticide use has a negative impact on health and the environment and may lead to poor organic production practices, concerns about the origin of the organic produce, past experience with known organic producers, and interest in the production practices of organic produce. The results also suggest that when used eco-labels do in fact influence organic produce selection, and that those who are most likely to rely on eco-labels in their organic produce selection exhibit concern over food safety, the environment, and the production process of organic produce.

Furthermore, households most likely to have females doing most of the food purchases and to consist of residents over 35 years of age who may be more concerned about structuring their diets to avoid potential sources of illness are also most likely to rely on eco-labels in their purchases. The findings also suggest a direct relationship between income levels and marginal probability of eco-label use—i.e., the marginal probability of eco-label use increases as income increases. Together, each of the significant variables exclusive of education provide a clear picture of the determinants that northeast Arkansas consumers use as basic requirements for eco-labels.

In the absence of universal acceptance of eco-labels, the findings from this study may illustrate a potential challenge for organic producers: the importance of an agent seal—but not the proposed USDA organic seal—in attracting consumers to select or accept organic produce. The implication is that if consumers are to use the proposed USDA eco-label seal as a standard for selecting their organic produce, the proposed USDA eco-label standards must be universally accepted in the organic produce market.

The results indicate common concerns about eco-labels for consumers across northeast Arkansas. While the results are perhaps expected, they re-emphasize the challenges the USDA faces in designing acceptable uniform eco-label standards for organic producers and consumers across the nation. Furthermore, while this study supplements other organic produce studies, it also provides a more current picture of the major determinants that influence eco-label use among consumers, which will be valuable as the USDA proposed organic standards are implemented in the market.

The major implication for this study is that if producers are to remain in the organic produce market (i.e., if they are to make profit) they must grow and sell what their customers want to buy. Determinants of eco-label standards therefore measure the values in the organic produce industry. For this reason, specifications or inputs for an effective eco-label standard must meet the values and behavior of all market participants and must satisfy all levels of the marketing system. As this study has shown, if an eco-label standard concentrates on influencing what is sold, and the values and behavior of producers and traders in the market, the analysis should employ determinants that are beneficial to consumers. These procedures may be beneficial in other food-policy decisions, particularly in identifying the information that consumers use in selecting or purchasing food products, what producers must produce, and the behavior and values of market participants.

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