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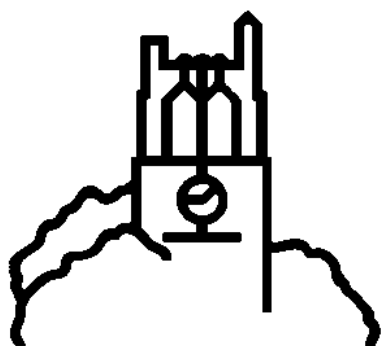
# ***Staff Paper***

## **Consumer Demand for Ecolabeled Apples: Survey Methods and Descriptive Results**

Jeffrey Blend and Eileen van Ravenswaay

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Department of Agricultural Economics  
MICHIGAN STATE UNIVERSITY  
East Lansing, Michigan 48824

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# **CONSUMER DEMAND FOR ECOLABELED APPLES: SURVEY METHODS AND DESCRIPTIVE RESULTS\***

**by**

**Jeffrey Blend and Eileen O. van Ravenswaay\*\***  
[blendjef@pilot.msu.edu and raven@pilot.msu.edu]

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\*\*Jeffrey Blend is a Graduate Research Assistant and Eileen O. van Ravenswaay is a Professor in the Department of Agricultural Economics at Michigan State University.

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# **Consumer Demand for Ecolabeled Apples: Survey Methods and Descriptive Results**

## **1. Introduction**

Ecolabeling is a new phenomenon in agriculture. There are standards for many other safety and quality attributes of agricultural products, but environmental standards are just beginning to emerge. There are many unanswered questions about what standards consumers want and at what price.

An ecolabel is a voluntary claim that a product meets environmental standards. Ecolabels are established by public or private standard-setting organizations. The key feature is standardization. Ecolabels are standardized environmental claims as opposed to unique declarations by a product maker. On agricultural products, ecolabel standards usually specify production practices that farmers must use. Examples of such practices include Integrated Pest Management (IPM), water and energy conservation and designation of acreage for wildlife habitat.<sup>1</sup>

This paper examines potential consumer demand for ecolabeled apples. Since apples are purchased by 90% of U.S. households, we are able to investigate the choices of a large and diverse cross section of consumers. Focusing on a single agricultural product such as apples enables us to investigate more specific and realistic consumer choices.

This paper also examines how different types of ecolabel claims might affect consumer demand. Ecolabels may vary in terms of the comprehensiveness of their environmental claims and the amount of proof substantiating claims. Ecolabels might claim to reduce only a single environmental impact or they might claim to reduce multiple environmental impacts. There may be no proof for the claims other than seller reputation or the claims might be documented and verified by a highly reputable third party (e.g. government agency, private firm, non-profit environmental group). Each unique combination of claim comprehensiveness and proof represents a different ecolabel and thus a different good. This paper examines how two levels of claim comprehensiveness and two forms of proof affect consumer demand.

Finally, this paper examines factors affecting consumer demand for ecolabels. These factors include prices, income, household size and education. They also include familiarity with the claim and personal motivations such as improved health and environmental concerns. Both the purchase location of apples and whether or not an individual normally buys organic are also examined.

## **2. Methods**

The potential demand for ecolabeled and regular (e.g. unlabeled) apples is examined using data from a phone survey of a random sample of U.S. households. The questionnaire elicited apple purchasing

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<sup>1</sup>A detailed description of ecolabeling programs is contained in a series of four reports commissioned by the U.S. EPA (1993a,b,c and 1994). For a description of ecolabels used in agriculture see van Ravenswaay and Blend (1997).

intentions with and without ecolabeling. (The questionnaire is in Appendix C.) The respondents interviewed normally do the food shopping for the household.

Because ecolabels are new, a simulated market was created within the questionnaire. Respondents were presented with descriptions and prices of regular and ecolabeled apples and asked which they would buy and how much they would buy. The questions were asked in terms of household purchases during a single shopping occasion in late autumn and early winter.

To simulate markets with and without ecolabeling, two market scenarios were presented to respondents. The first involved a market in which the respondent's preferred or regular apple was available at various prices. The second market scenario was identical except that both regular and ecolabeled versions were available. The quality and display of the apples was the same for both market scenarios.

In the first market scenario, respondents were asked to imagine themselves in their typical apple purchasing setting and given a randomly selected price for regular apples. They were told that the prices of other fruits were what would normally be expected, that all apples were the same price per pound no matter how displayed and that apples were not selling for less at other stores. Respondents were also told that all apples were available in their favorite varieties, qualities and sizes. In this way, the effects upon apple demand of substitute fruits, packaging, competitor prices and non-environmental attributes were held constant.

Given the market scenario and price, respondents were asked whether or not they would buy the regular apples. If the answer was yes, they were asked how much they would buy at the given price. The respondent's answer to this second question is the quantity demanded of regular apples when these are the only brand available.

In the second market scenario, the ecolabeled apple was introduced. A verbal description of its attributes was given. The price of regular apples was the same as in the first market scenario. The price of ecolabeled apples was equal to the price of the regular apples plus a randomly assigned price premium. Given prices for both apples and the ecolabel description, respondents were then asked which and how much they would buy at the given price(s). The respondent's answer to this second question is the quantity demanded of regular and ecolabeled apples when both are available.

To test the effects of different types of ecolabels on purchasing intentions, four ecolabel descriptions were randomly varied across respondents. (A detailed description of how the ecolabel descriptions were developed is in Appendix A.) The ecolabel descriptions varied in terms of two dimensions: comprehensiveness of the environmental claim and proof substantiating the environmental claim. Two variations of each of these dimensions were incorporated into the descriptions of the ecolabels. The four ecolabel names are shown in Table 1.

There were fewer environmental claims made in the IPM (Integrated Pest Management) label because it specified production practices for pest control only as opposed to the wider range of practices that could reduce environmental impact. The ECO claims were more comprehensive because it specified production practices which lower a number of farm-related environmental impacts. These included

efficient water and energy usage, the use of naturally occurring fertilizers for better water and soil quality, natural insect controls and reduced pesticide use.

**Table 1**  
**Names of Ecolabels in the Questionnaire**

<i><b>DIMENSIONS OF ECOLABEL WORDING</b></i>		<b>PROOF OFFERED TO SUBSTANTIATE CLAIM?</b>	
		<b>No</b>	<b>Yes</b>
<b>AMOUNT OF ENVIRONMENTAL CLAIMS MADE?</b>	<b>More</b>	<i>ECO</i>	<i>USDA Certified ECO</i>
	<b>Less</b>	<i>IPM</i>	<i>USDA Certified IPM</i>

Proof was described in terms of whether the ecolabel claims were externally verified by a certifying organization. The ECO and IPM ecolabels were either described as being certified by the USDA or not at all. Certification by the USDA rather than a private agent or a non-profit environmental group was chosen because USDA is familiar to most food consumers. Other types of certifying organizations could be specified, but require a larger sample size than our research funding permitted.

The four ecolabels were randomly varied across respondents with equal probability so that approximately equal numbers would receive each. Approximately half the sample were given the IPM ecolabel and half were given the ECO ecolabel. Approximately half were told that the ecolabel was certified. Certification status was not mentioned to the other half of the sample. The number of respondents receiving each ecolabel is shown in Table 2.

**Table 2**  
**Number of Respondents for Each Ecolabel**

TYPE OF ECOLABEL	Not Certified	Certified
ECO	248	242
IPM	243	239

Three regular apple prices of \$.59, \$.89 and \$1.19 per pound were randomly varied across respondents with equal probability. Additional prices could be specified, but require a larger sample size than our research funding permitted. The prices were chosen to reflect variation around the average U.S. apple price.<sup>2</sup> Three price premiums for ecolabeled apples of \$.00, \$.20, and \$.40 were randomly varied across respondents with equal probability. Additional price premiums would have required an increase in sample size that our research funding did not permit. These three values are based on price premiums for organic apples in the U.S.<sup>3</sup> A detailed description of how the ecolabel prices were developed is in Appendix A.

Randomly varying three regular apple prices and three price premiums across the sample resulted in nine different price combinations that a respondent could receive. The price combinations are listed in Table 3. The remaining tables are shown in a section following the text of this paper.

The four ecolabel descriptions multiplied by the nine price combinations resulted in 36 total versions of the survey market scenario randomly varied across respondents. These are summarized in Figure 1.

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<sup>2</sup>U.S. apple prices were obtained from United States Department of Agriculture, Economics Research Service, Fruit and Tree Nuts Situation and Outlook Report, March 1997, FTS-279, p. 5 and United States Department of Agriculture, Economics Research Service, Fruit and Tree Nuts Situation and Outlook Report. Yearbook Issue, October 1996, FTS-278, p. 6.

<sup>3</sup>Organic apple price premiums were obtained from Hammit, James, Organic Carrots: Consumer Willingness to Pay to Reduce Food Borne Risks, 1986, Santa Monica: The RAND Corp., R-3447-EPA and Jolly, D., Consumer Willingness to Pay Price Premiums for Organic Apples and Peaches, March 1989, Department of Agricultural Economics, University of California, Davis and Jolly, D., "Differences Between Buyers and Non-buyers of Organic Produce and Willingness to Pay Organic Price Premiums", *Agribusiness*, 9:97-111.

**Figure 1**  
**The Survey Versions**

<b>Two ecolabels</b>	<b>X</b>	<b>Two forms of proof</b>	<b>X</b>	<b>Three regular apple prices</b>	<b>X</b>	<b>Three ecolabel price premiums</b>	<b>= 36 survey versions</b>
<i>IPM</i>		<i>USDA certified</i>		<i>\$.59/lb</i>		<i>\$.00</i>	
<i>ECO</i>		<i>Not certified</i>		<i>\$.89/lb</i>		<i>\$.20</i>	
				<i>\$1.19/lb</i>		<i>\$.40</i>	

In order to gain additional information on purchasing intentions at little extra cost, respondents were asked the same questions about regular and ecolabeled apples given a second set of prices.<sup>4</sup> If in the first market scenario the respondent said they would buy regular apples, a second price for regular apples was set at \$.20 per pound higher. If they said they would not buy them, a second price was set at \$.20 per pound lower. Given the second price, respondents were asked whether or not they would buy the regular apples and, if so, how much they would buy. This same procedure was followed for ecolabeled apples in the second market scenario.

Respondents were asked several questions in order to identify factors affecting their purchases. These factors included demographics such as income and education, motivations for purchasing ecolabeled apples, and whether or not the householder purchased organic. For each factor, statistical tests were run to determine whether those who gave different answers made different choices.

Respondents were asked, for example, where they normally buy apples because purchasing location affects the shopping setting and thus might affect one's choice. Based upon their responses, respondents were designated as either those who buy apples at a supermarket/grocery store or those who do not. It was then determined whether or not there was a statistically significant difference in purchasing choices between the two groups.

Respondents were asked their age and education and their household's annual income and size.<sup>5</sup> This was done in order to account for the effects of demographics upon purchasing decisions.

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<sup>4</sup>Additional prices could be given to respondents, but that would have lengthened the number of minutes of each interview. A longer interview increases nonresponse rates and increases research costs beyond our research budget constraint.

<sup>5</sup>The demographic data was coded in such a way as to be consistent with the figures reported in the U.S. Bureau of the Census Report from 1997.



Organic apples are a potential substitute for ecolabeled apples and are often sold at limited locations. To account for this, respondents were asked if and how often they bought organic apples. Those who bought them and did so ‘often’ or ‘always’ were identified as organic apple buyers.<sup>6</sup>

Respondents’ perceptions of the ecolabel were also taken into account. Familiarity with the ecolabel claim may indicate greater knowledge of the standards within that claim and thus affect one’s choice. To account for familiarity, respondents who received the IPM ecolabel were asked how much they had seen, heard, or read about IPM. Those who said that they had heard a fair amount or a great deal about IPM were designated as familiar with the claim. Respondents receiving the ECO ecolabel were not asked about familiarity with ECO since ECO is not marketed anywhere at this time.

To account for the different motivations behind particular brand selections, respondents who said they would buy some of the ecolabeled apples were asked why in an open-ended question format. Respondents were allowed to give up to three reasons for buying ecolabeled. Their responses were coded into categories such as “concern for the environment” and “health and food safety concerns.” Those who said they would not buy the ecolabeled apples were also asked why and their open-ended responses were coded into categories such as “ecolabel price too high.”

## II The Survey Sample

The phone interviews were conducted by the Institute for Public Policy and Social Research (IPPSR) at Michigan State University between November 3, 1997 and February 11, 1998. IPPSR purchased the phone numbers from Gensys Sampling Inc. who generated a proportional sample of random numbers from the lower 48 states.<sup>7</sup> Of 1453 eligible phone numbers that were contacted, 972 interviews were completed resulting in a participation rate of 66.9 %. The sample selection process and demographic characteristics of respondents are described in detail in Appendix B.

Only those respondents who ever buy apples were asked the apple purchasing questions. Ninety-two percent of respondents (i.e., n=893) reported that they buy fresh apples for their household (see Table 4).<sup>8</sup> We refer to these respondents as the **subsample**. All the results reported in the next section of the paper are for the subsample only.

Tables 5 through 9 show the demographic characteristics of the full sample and subsample. The tables also show the same characteristics of U.S. households taken from the most recent U.S. Census data. Three-quarters of our respondents were female. Households which earned higher incomes were

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<sup>6</sup>Because a small minority of apple purchasers buy organic in the U.S., a more costly and complicated approach of creating ‘organic’ demand questions was avoided.

<sup>7</sup>Alaska and Hawaii were excluded for cost reasons. If these states had been included either the sample size or the interview length would have had to be reduced to stay within our research funding limit.

<sup>8</sup>Those who do not buy apples for their household were asked why. The majority (67%) claimed that their household does not like or eat them. Other reasons included the expense, a preference for canned foods, a preference for other fruits, and that apples are unhealthy.

over-represented in our sample as were larger households and householders with more education. There is little difference in the demographic composition of the full sample and subsample.

#### **4. Results**

Ninety percent of the subsample respondents said they would buy the regular apples presented in our first market scenario when prices were \$.59 and \$.89 per pound, but only 77% said they would at \$1.19 (Table 10).

Sixty-nine percent of those refusing to buy regular apples at these prices said they were too expensive (Table 11). Seventy percent of those who said they would buy said they still would if the price were \$.20/lb. higher (Table 12). Over half of those who would not buy (59%) said they would if the price were \$.20/lb lower (Table 12).

Over half of respondents would try the ecolabeled (i.e., either IPM or ECO) apples presented in our second market scenario regardless of the price (Table 13). The percentage buying either some ecolabeled or only ecolabeled apples is consistent across each of the three prices of \$.59, \$.89 and \$1.19 given for regular apples (Table 14). However, the greater the price premium, the lower the percentage of respondents who would buy some (Tables 15 through 18).<sup>9</sup> Seventy-two percent of those who were offered regular and ecolabeled apples at the same price said they would buy the ecolabeled. Fifty-two percent of those receiving a \$.20 price premium bought some of the ecolabeled. At a \$.40 price premium, the percentage who said they would buy was 42%.

The percentage of respondents buying ecolabeled (i.e., either ECO or IPM) apples decreases as the percentage markup over the regular price increases (Table 19). At a 0% price premium, 73% would buy ecolabeled apples. At the highest premium of 67%, only 43% of respondents would buy ecolabeled apples.

Forty-one percent of those not buying ecolabeled apples said they would buy them if the price was \$.20/lb less (Table 20). Fifty-four percent of those who would buy ecolabeled apples said they would still buy if the price was \$.20/lb higher.

The form of proof in the ecolabel had little effect upon ecolabel purchases (Table 21). Fifty-six percent of those receiving the USDA certified version bought ecolabeled apples compared with 55% of those receiving an ecolabel with no certification. These percentages were not statistically significantly different at the 5% level across the two forms of proof.

The ECO apples were slightly more popular than IPM apples (Table 22). Fifty-eight percent of those receiving the ECO apples bought some compared with 53% of those receiving the IPM apples. These percentages were not statistically significantly different at the 5% level across the two labels.

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<sup>9</sup>The reported percentages of respondents buying ecolabeled apples includes both those who bought ecolabeled only and those who bought some of both types of apples.

Health and food safety was the most frequently given reason for purchasing ecolabeled apples (Table 23). Thirty-seven percent mentioned health or food safety, including the avoidance of chemicals in food and better health for their family, as their first answer. Twenty-seven percent mentioned concern for the environment as their first answer and 19% mentioned the desire to try out the ecolabeled apples. Among the second answers given, the top five reasons for buying ecolabeled were the same. Among the third answers given, four of the top five reasons were the same.

Respondents' top reasons for not purchasing ecolabeled apples were that they were too expensive (46%), that they did not know enough about the ecolabeled brand (22%), that they preferred their usual brand (9%) and that the regular apples were just as safe to consume (8%) (Table 24). Nine percent of responses indicated distrust of the ecolabel, IPM or the USDA. Among the second reasons given, the top four were the same except that the most common was not knowing enough about the ecolabel. Among the third reasons given, expense and lack of knowledge about the ecolabel again topped the list.

Higher income households bought ecolabeled apples more often (Table 25). Forty-nine percent of households that earned less than \$30,000 bought ecolabeled apples.<sup>10</sup> Households that earned between \$30,000 and \$60,000 bought them 65% of the time. This figure was 59% for households earning between \$60,000 and \$90,000 and 67% for households earning over \$90,000.

Households with two or more occupants bought ecolabeled apples more often than those with one (Table 26). Forty-seven percent of respondents who lived alone would buy ecolabeled apples. Households with two occupants bought ecolabeled apples 55% of the time. This figure was 59% for households with three occupants, 60% for those with four and 59% for those with five or more. Households with more than one occupant are more likely to have children and families living in them and thus may be more concerned about the residues on their food, their family's health, and future environmental quality.

Respondents with more education bought ecolabeled apples more often (Table 27). Thirty percent of those with less than a high school education bought ecolabeled apples. This figure was 51% among high school graduates, 58% among those with some college education, and 63% among college graduates or those with professional training. More educated respondents may possess greater knowledge about environmental problems or chemical residues in food.

Ninety percent of respondents said they buy apples at supermarkets or grocery stores. The other locations are listed in Table 28. Whether one buys apples in a supermarket or grocery store versus some other location is not significant to the ecolabel decision (Table 29). Fifty-five percent of respondents who normally buy apples at a grocery store or supermarket would buy some ecolabeled apples compared with 58% of those who buy elsewhere. There was no statistically significant difference at a 5% level between these two values.

Only a small percentage of the apple shoppers said they normally buy organic (Table 30). About 3% indicated that they buy organic apples often or always, 15% that they do so rarely or occasionally, 74% that they do not, and 8% that they are not sure. Those who normally buy organic apples bought

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<sup>10</sup>All reported income is that earned by the household in 1996.

ecolabeled apples more often (Table 31). Seventy-three percent of those who normally buy organic apples said they would buy ecolabeled apples compared with 55% of those who do not.

The majority of householders have heard very little about IPM (Table 32). Those who received a survey with the IPM apples were asked how much they had seen, heard or read about IPM. About 66% said nothing at all, 26% said a little, 4% said a fair amount and 3% said a great deal. Respondents who heard a fair amount or a great deal about IPM were identified as familiar with IPM.

Those familiar with IPM bought IPM apples less often (Table 33). Of those who were familiar, 36% said they would buy IPM apples. Fifty-four percent of those not familiar bought the IPM apples.

## **5. Conclusions**

The objective of this research was to examine consumer demand for ecolabeled apples. A phone survey of randomly selected U.S. homes was used to measure purchase intentions for ecolabeled and regular apples on a single shopping trip. Respondents were given prices and detailed descriptions of ECO and IPM ecolabels and asked if they would buy them. The survey questions and scenarios were designed to examine whether comprehensiveness of the environmental claim and USDA certification would make a difference. The survey also identified reasons why consumers choose ecolabeled apples over regular apples.

A significant percentage of apple consumers would try ecolabeled apples if they were available and would pay a price premium for them. Fifty-six percent of regular apple buyers said they would buy some ecolabeled apples.

The percentage of apple consumers who would try ecolabeled apples depends on the price premium. At a \$.00 price premium, 72% would buy ecolabeled apples. At a \$.20 price premium, 52% would buy them. At a \$.40 price premium, this figure drops to 42%.

The percentage buying ecolabeled apples decreases as the percentage markup of the price premium over regular price increases. At a 0% price premium, 73% would buy ecolabeled apples. At the top premium of 67%, only 43% of respondents would buy them.

The comprehensiveness of the environmental claim may not be significant. While a slightly higher percentage would buy the ECO (58%) than the IPM (53%), the difference is not statistically significant. However, only one way of wording these two types of environmental claims could be examined in this study. More research is needed to determine whether or not there is added value to more comprehensive environmental claims.

Proof on the label may not be significant. Fifty-five percent of the sample receiving the market scenario where ecolabeled apples were not certified claimed they would buy them. Of the half of the sample receiving the scenario in which they were certified, 56% claimed they would buy some. There is no statistically significant difference at a 5% level between the certified and non-certified percentages. The percentage buying USDA certified (56%) is virtually identical to the percentage buying ecolabeled when certification is not even mentioned. However, there are many other possible certifiers, so it is

unclear whether certification is not significant or simply certification by the USDA is not significant. More research is needed on different forms of proof of environmental claims.

Environmental and food safety improvements are both a source of added value in food ecolabels, but food safety is more important than environment. Thirty-seven percent give food safety as their first reason for buying ecolabeled apples compared to 27% citing environmental reasons first. Consumers are apparently aware that agricultural practices that affect the environment also affect food safety. Thus, both sources of value should be stressed in developing agricultural ecolabels.

Determining the price premium correctly will be a major factor in the market success of ecolabels. Consumers are most likely to refuse to try ecolabels because of the price premium (46%).

However, educating consumers about the nature of the environmental claim will be an important factor, too. Lack of familiarity with the environmental claims is an important reason for refusing to try ecolabeled apples (22%). Only a small percentage (8%) refuse because there is no food safety gain from IPM or ECO apples.

Demographic factors will help pinpoint the consumer segment most likely to try ecolabeled apples. Higher income and larger sized households will be more likely to buy ecolabeled apples. Food shoppers with more education will also be more likely to buy.

Whether one buys apples in a supermarket or grocery store versus some other location is not significant. However, organic food consumers are more likely to try ecolabeled apples, although they are a very small segment of apple consumers (about 3%).

Over 90% of consumers are unfamiliar with IPM. However, those who are familiar are much less likely to buy IPM apples than those who are unfamiliar. This could mean consumers currently familiar with IPM do not believe it improves the environment enough to add sufficient value to the ecolabel or that they do not value environmental improvements as much as other consumers. If the former explanation is correct, the market potential for an IPM rather than an ECO ecolabel could be jeopardized by a campaign to educate consumers about IPM.

## TABLES

**Table 3**  
**Price Combinations Used in the Questionnaire**

<i>Price Combinations</i>	<b>Regular apple price (\$/lb.)</b>	<b>Price premium for ecolabeled<sup>a</sup> apples</b>	<b>Ecolabeled<sup>a</sup> apple price (\$/lb.)</b>
<b>1</b>	\$.59	\$.00	\$.59
<b>2</b>	\$.59	\$.20	\$.79
<b>3</b>	\$.59	\$.40	\$.99
<b>4</b>	\$.89	\$.00	\$.89
<b>5</b>	\$.89	\$.20	\$1.09
<b>6</b>	\$.89	\$.40	\$1.29
<b>7</b>	\$1.19	\$.00	\$1.19
<b>8</b>	\$1.19	\$.20	\$1.39
<b>9</b>	\$1.19	\$.40	\$1.59

<sup>a</sup>Ecolabeled apples refer to both IPM and ECO apples.

**Table 4**  
**Do you buy fresh apples for your household when they are in season?**  
N=972

<i>Response</i>	<b>Percent of Sample</b>
<b>Yes</b>	91.5 %
<b>No</b>	8.4 %
<b>Don't know</b>	0.1 %

**Table 5**  
**Household Composition**

<i>Household Composition</i>	<b>Percent of Census<sup>a</sup></b>	<b>Percent of Sample<sup>b</sup></b>	<b>Percent of Subsample<sup>b</sup></b>
<b>Average household size (number of people)</b>	2.65	2.87	2.93
<b>Percentage of households with children under 18</b>	34.3%	42.2%	43.2%
<b>Percentage of single-person households</b>	24.9%	17.0%	15.3%

<sup>a</sup>Source: U.S. Bureau of the Census, Statistical Abstract of the United States: 1996 (116<sup>th</sup> edition) Washington, D.C., 1996. Pages 60, 160, 61, and 465.

<sup>b</sup>'Sample' refers to the full sample of 972 respondents that were contacted. 'Subsample' refers to the 893 respondents in the full sample that buy apples.

**Table 6**  
**Age of the Respondents**

<i>Age of Householder<sup>a</sup></i>	<b>Percent of Census<sup>b</sup></b>	<b>Percent of Sample<sup>c</sup></b>	<b>Percent of Subsample<sup>c</sup></b>
<b>15-24 years</b>	5.3%	6.5%	6.6%
<b>25-34 years</b>	19.3%	18.8%	18.1%
<b>35-44 years</b>	23.3%	22.1%	24.5%
<b>45-54 years</b>	18.0%	19.1%	19.6%
<b>55-64 years</b>	12.4%	11.6%	11.8%
<b>65-74 years</b>	11.9%	8.2%	8.3%
<b>75 years and older</b>	9.6%	6.5%	6.5%
<b>Refused</b>	-----	5.0%	4.5%

<sup>a</sup>Because respondents had to be at least 18 years old to complete this survey, the first age category is 18-24 years for sample and sub-sample respondents.

<sup>b</sup>Source: U.S. Bureau of the Census, Statistical Abstract of the United States: 1996 (116<sup>th</sup> edition) Washington, D.C., 1996. Pages 60, 160, 61, and 465.

<sup>c</sup>'Sample' refers to the full sample of 972 respondents that were contacted. 'Subsample' refers to the 893 respondents in the full sample that buy apples.

**Table 7**  
**Educational Attainment of Respondents**

<i>Education level</i>	<b>Percent of Census<sup>a</sup></b>	<b>Percent of Sample<sup>b</sup></b>	<b>Percent of Subsample<sup>b</sup></b>
<b>Did not graduate high school</b>	18.3%	6.7%	6.0%
<b>High school diploma</b>	33.6%	28.1%	27.3%
<b>Some college</b>	24.5%	30.1%	30.6%
<b>College or graduate education</b>	23.6%	32.7%	33.9%
<b>Refused</b>	-----	2.4%	2.0%

<sup>a</sup>Source: U.S. Bureau of the Census, Statistical Abstract of the United States: 1996 (116<sup>th</sup> edition) Washington, D.C., 1996. Pages 60, 160, 61, and 465.

<sup>b</sup>'Sample' refers to the full sample of 972 respondents that were contacted. 'Subsample' refers to the 893 respondents in the full sample that buy apples.

**Table 8**  
**Gender of Respondents**

<i>Gender</i>	<b>Percent of Sample<sup>a</sup></b>	<b>Percent of Subsample<sup>a</sup></b>
<b>Female</b>	75.0%	76.8%
<b>Male</b>	25.0%	23.3%

<sup>a</sup>'Sample' refers to the full sample of 972 respondents that were contacted. 'Subsample' refers to the 893 respondents in the full sample that buy apples.



**Table 9**  
**Household Income**

<i>Total household income in 1996</i>	<b>Percent of Census Households<sup>a</sup></b>	<b>Percent of Sample<sup>b</sup></b>	<b>Percent of Subsample<sup>b</sup></b>	<b>Percent of subsample who reported income<sup>c</sup></b>
<b>Less than \$10,000</b>	12.3%	3.0%	2.1%	2.6%
<b>\$10,000-\$49,000</b>	55.7%	43.8%	44.7%	55.0%
<b>\$50,000 or more</b>	31.9%	33.4%	34.5%	42.4%
<b>No answer</b>	-----	19.8%	18.7%	-----
<b>Mean household income</b>	\$34,076	-----	-----	\$53,003

<sup>a</sup>Source: U.S. Bureau of the Census, Statistical Abstract of the United States: 1996 (116<sup>th</sup> edition) Washington, D.C., 1996. Pages 60, 160, 61, and 465.

<sup>b</sup>'Sample' refers to the full sample of 972 respondents that were contacted. 'Subsample' refers to the 893 respondents in the full sample that buy apples.

<sup>c</sup>This column was included to compare those respondents in the subsample who reported income with Census figures.

**Table 10**  
**If you were in your typical shopping setting and the price of the apples you normally buy was \$\_\_\_/lb., would you buy some?**

<i>DECISION TO BUY REGULAR APPLES</i>		PERCENT RESPONDENTS			
		Yes	No	Don't know	Refused
<b>PRICE OF REGULAR APPLES (\$/lb.)</b>	<b>\$ .59</b>	89.7%	7.7%	2.3%	0.3%
	<b>\$ .89</b>	89.9%	6.8%	2.4%	1.0%
	<b>\$1.19</b>	77.0%	19.2%	3.5%	0.3%

**Table 11****Why would you not buy any apples? (Open ended)***(Note: Asked only to those who said they would not buy apples given the assigned price)**(N=120)*

<i>Stated Reason</i>	<b>Percentage of respondents</b>
<b>They are too expensive</b>	69.2%
<b>Household purchases apples on very infrequent basis</b>	10.0%
<b>Have other fruit available at lower or no cost</b>	5.0%
<b>Do not know</b>	5.0%
<b>Refused</b>	0.8%

**Table 12**

**If you were in your typical apple shopping setting and the price of the apples you normally buy was now \$\_\_\_/lb., would you buy some?**

<b><i>DECISION TO BUY REGULAR APPLES GIVEN SECOND PRICE</i></b>			<b>PERCENT RESPONDENTS</b>			
			<b>Yes</b>	<b>No</b>	<b>Don't know</b>	<b>Refused</b>
<b>SECOND PRICE OF REGULAR APPLES (\$/lb.)</b>	<b><i>Lower by \$.20/lb</i></b>	<b>\$.39</b>	59.4%	31.3%	6.3%	3.1%
		<b>\$.69</b>	60%	26.7%	6.7%	6.7%
		<b>\$.99</b>	57.8%	31.8%	9.1%	1.5%
	<b><i>Higher by \$.20/lb</i></b>	<b>\$.79</b>	87.1%	10.4%	2.5%	0.0%
		<b>\$1.09</b>	67.7%	28.2%	4.1%	0.0%
		<b>\$1.39</b>	58.6%	30.5%	7.8%	3.1%

**Table 13**  
**Percent respondents purchasing regular and ecolabeled apples when both are available**

<b>Regular only</b>	<b>Ecolabeled only<sup>a</sup></b>	<b>Some of both apples</b>	<b>No apples</b>	<b>Don't know</b>	<b>Refused</b>
33.2%	41.7%	13.9%	6.3%	4.4%	0.7%

<sup>a</sup>Ecolabeled apples refer to both IPM and ECO apples.

**Table 14**  
**Percent respondents purchasing regular and ecolabeled apples when both are available and price of regular apples is \$\_\_\_/lb.**

<b><i>Regular apple price (\$/lb.)</i></b>	<b>Regular only</b>	<b>Ecolabeled only<sup>a</sup></b>	<b>Some of both</b>	<b>No apples</b>	<b>Don't know</b>	<b>Refused</b>
<b>\$.59</b>	32.3%	43.2%	14.8%	6.5%	2.6%	0.6%
<b>\$.89</b>	35.4%	40.2%	14.8%	5.2%	1.9%	1.3%
<b>\$1.19</b>	31.7%	41.5%	12.5%	10.8%	3.5%	0.0%

<sup>a</sup>Ecolabeled apples refer to both IPM and ECO apples.

**Table 15**  
**Percent respondents purchasing regular and ecolabeled apples when regular apples are \$.59/lb and ecolabeled apples are \$\_\_\_/lb.**

<b><i>Price of ecolabeled apples<sup>a</sup> (\$/lb.)</i></b>	<b>Regular Apples</b>	<b>Ecolabeled Apples<sup>a</sup></b>	<b>Some of both apples</b>	<b>No apples</b>	<b>Don't Know</b>	<b>Refused</b>
<b>\$.59</b>	13.6%	61.2%	14.6%	1.9%	7.8%	1.0%
<b>\$.79</b>	41.0%	41.0%	14.3%	1.0%	2.9%	0.0%
<b>\$.99</b>	42.2%	27.5%	15.7%	7.8%	5.9%	1.0%

<sup>a</sup>Ecolabeled apples refer to both IPM and ECO apples.

**Table 16**

**Percent respondents purchasing regular and ecolabeled apples when regular apples are \$.89/lb and ecolabeled apples are \$\_\_\_/lb.**

<i>Price of ecolabeled apples<sup>a</sup> (\$/lb.)</i>	<b>Regular Apples</b>	<b>Ecolabeled Apples<sup>a</sup></b>	<b>Some of both apples</b>	<b>No apples</b>	<b>Don't Know</b>	<b>Refused</b>
<b>\$.89</b>	16.5%	54.4%	19.4%	2.9%	3.9%	2.9%
<b>\$1.09</b>	41.2%	35.1%	11.3%	5.2%	7.2%	0.0%
<b>\$1.29</b>	50.0%	30.2%	14.6%	4.2%	0.0%	1.0%

<sup>a</sup>Ecolabeled apples refer to both IPM and ECO apples.

**Table 17**

**Percent respondents purchasing regular and ecolabeled apples when regular apples are \$1.19/lb and ecolabeled apples are \$\_\_\_/lb.**

<i>Price of ecolabeled apples<sup>a</sup> (\$/lb.)</i>	<b>Regular Apples</b>	<b>Ecolabeled Apples<sup>a</sup></b>	<b>Some of both apples</b>	<b>No apples</b>	<b>Don't Know</b>	<b>Refused</b>
<b>\$1.19</b>	19.0%	56.0%	12.0%	9.0%	4.0%	0.0%
<b>\$1.39</b>	37.0%	38.0%	13.0%	7.6%	4.4%	0.0%
<b>\$1.59</b>	40.0%	29.5%	9.5%	17.9%	3.2%	0.0%

<sup>a</sup>Ecolabeled apples refer to both IPM and ECO apples.

**Table 18**  
**Percent respondents purchasing regular and ecolabeled apples when the price premium on ecolabeled apples is \$\_\_\_/lb.**

<i>Price Premium on ecolabeled apples<sup>a</sup> (\$/lb.)</i>	<b>Regular Apples</b>	<b>Ecolabeled Apples<sup>a</sup></b>	<b>Some of both apples</b>	<b>No apples</b>	<b>Don't Know</b>	<b>Refused</b>
<b>\$.00</b>	16.3%	57.2%	15.4%	7.2%	2.6%	1.3%
<b>\$.20</b>	39.8%	38.1%	14.3%	5.4%	1.4%	0.0%
<b>\$.40</b>	44.0%	29.0%	13.3%	9.9%	3.1%	0.7%

<sup>a</sup>Ecolabeled apples refer to both IPM and ECO apples.

**Table 19**  
**Percent respondents purchasing regular and ecolabeled apples when the price premium on ecolabeled apples is \_\_% of regular price.**

<i>Price Premium as a percentage of regular apple price</i>	<b>Regular Apples</b>	<b>Ecolabeled Apples<sup>a</sup></b>	<b>Some of both apples</b>	<b>No apples</b>	<b>Don't Know</b>	<b>Refused</b>
<b>0%</b>	16.3%	57.2%	15.4%	4.6%	5.2%	1.3%
<b>17%</b>	37.0%	38.0%	13.0%	7.6%	4.4%	0.0%
<b>22%</b>	41.2%	35.1%	11.3%	5.2%	7.2%	0.0%
<b>34%</b>	43.2%	36.0%	12.0%	9.0%	3.0%	0.0%
<b>45%</b>	50.0%	30.2%	14.6%	4.2%	0.0%	1.0%
<b>68%</b>	42.2%	27.5%	15.7%	7.8%	5.9%	1.0%

<sup>a</sup>Ecolabeled apples refer to both IPM and ECO apples.

**Table 20**

**Percent respondents purchasing regular and ecolabeled apples when the second price premium on ecolabeled apples is \$\_\_\_/lb.**

<i><b>APPLES PURCHASED GIVEN SECOND PRICE PREMIUM</b></i>		<b>PERCENT RESPONDENTS</b>					
		<b>Regular Apples</b>	<b>Ecolabeled Apples<sup>a</sup></b>	<b>Some of both apples</b>	<b>No apples</b>	<b>Don't know</b>	<b>Refused</b>
<b>SECOND PRICE PREMIUM AT \$.20/lb LOWER</b>	<b>-\$ .20</b>	29.8%	31.0%	8.3%	10.7%	15.5%	4.8%
	<b>\$.00</b>	27.1%	34.0%	25.0%	5.6%	8.3%	0.0%
	<b>\$.20</b>	53.3%	11.8%	14.2%	14.8%	4.7%	1.2%
<b>SECOND PRICE PREMIUM AT \$.20/lb HIGHER</b>	<b>\$.20</b>	36.9%	44.1%	13.1%	3.2%	2.7%	0.0%
	<b>\$.40</b>	31.3%	43.3%	14.7%	9.3%	1.3%	0.0%
	<b>\$.60</b>	36.6%	28.6%	11.6%	15.2%	8.0%	0.0%

<sup>a</sup>Ecolabeled apples refer to both IPM and ECO apples.

**Table 21**

**Percent respondents purchasing regular and ecolabeled apples with and without USDA Certification**

<i><b>Certification Status</b></i>	<b>Regular apples</b>	<b>Ecolabeled apples<sup>a</sup></b>	<b>Some of both apples</b>	<b>No apples</b>	<b>Don't know</b>	<b>Refused</b>
<b>Not Certified</b>	34.4%	42.8%	12.2%	6.3%	3.9%	0.5%
<b>USDA Certified</b>	31.9%	40.6%	15.5%	6.2%	4.9%	0.9%

<sup>a</sup>Ecolabeled apples refer to both IPM and ECO apples.

**Table 22**  
**Percent respondents purchasing regular and ecolabeled apples by type of ecolabel (IPM or ECO)**

<i>Ecolabel Version</i>	<b>Regular apples</b>	<b>Ecolabeled apples<sup>a</sup></b>	<b>Some of both apples</b>	<b>No apples</b>	<b>Don't know</b>	<b>Refused</b>
<b>IPM</b>	35.9%	39.9%	13.2%	6.5%	4.5%	0.0%
<b>ECO</b>	30.4%	43.4%	14.5%	6.0%	4.3%	1.3%

<sup>a</sup>Ecolabeled apples refer to both IPM and ECO apples.

**Table 23**  
**Q: Why did you choose to buy the ecolabeled<sup>a</sup> apples? (Open ended)**  
*(Note: This question asked only to those who bought ecolabeled apples)*

<i>Stated Reason</i>	<b>First Reason Percent Respondents (N=496)</b>	<b>Second Reason Percent Respondents (N=255)</b>	<b>Third Reason Percent Respondents (N=103)</b>
<b>Ecolabeled apples are better for the environment</b>	27.4 %	23.5%	23.3%
<b>To avoid chemicals in my food</b>	20.9 %	18.4%	21.4%
<b>To try them/Buy them out of curiosity</b>	18.9%	6.3%	2.9%
<b>Ecolabeled apples are safer/healthier for me and my family</b>	16.2 %	32.5%	23.3%
<b>The ecolabeled apple quality is better</b>	10.2 %	10.2%	9.7%
<b>Feels like I'm doing something good</b>	5.5 %	3.1%	4.8%
<b>I care about future generations</b>	1.6 %	2.4%	4.9%
<b>Don't know</b>	1.4 %	3.1%	6.8%
<b>Refused</b>	.6%	.4%	2.9%

<sup>a</sup>Ecolabeled apples refer to both IPM and ECO apples.

**Table 24****Q: Why did you choose not to buy the ecolabeled apples<sup>a</sup>? (Open-ended)***(Note: This question asked only to those respondents who did not buy ecolabeled apples)*

<i>Stated Reason</i>	<b>First Reason Percent Respondents (N=352)</b>	<b>Second Reason Percent Respondents (N=87)</b>	<b>Third Reason Percent Respondents (N=36)</b>
<b>They are too expensive</b>	46.3 %	14.9%	22.2%
<b>Do not know enough about ecolabels to buy them</b>	21.6 %	42.5%	44.4%
<b>Prefer own brand of apples</b>	8.5 %	6.9%	2.8%
<b>Regular apples are just as safe and healthy for my family</b>	8.2 %	14.9%	2.8%
<b>Do not trust/believe the ecolabel</b>	4.5 %	6.9%	0.0%
<b>They are an advertising gimmick</b>	2.3 %	4.6%	8.3%
<b>Do not trust the government/USDA</b>	2.0 %	0.0%	0.0%
<b>Do not like to try new things</b>	1.1 %	1.1%	2.8%
<b>Don't know</b>	4.3 %	5.7%	13.9%
<b>Refused</b>	1.1%	2.3%	2.8%

<sup>a</sup>Ecolabeled apples refer to both IPM and ECO apples.



**Table 25****Percent respondents purchasing regular and ecolabeled apples when household annual income is \$ \_***(Based upon those households who reported income)*

N=726

<i>Household Income in 1996</i>	<b>Regular Apples</b>	<b>Ecolabeled Apples<sup>a</sup></b>	<b>Some of both apples</b>	<b>No apples</b>	<b>Don't know</b>	<b>Refused</b>
<b>Under \$30,000</b>	37.8%	35.7%	13.3%	8.7%	3.6%	1.0%
<b>\$30,000-\$60,000</b>	29.0%	49.7%	15.0%	3.1%	3.1%	0.0%
<b>\$60,000-\$90,000</b>	34.6%	43.8%	15.4%	4.3%	1.2%	0.6%
<b>Over \$90,000</b>	29.3%	52.4%	14.6%	0.0%	3.6%	0.0%

<sup>a</sup>Ecolabeled apples refer to both IPM and ECO apples.**Table 26****Percent respondents purchasing regular and ecolabeled apples when household size is \_\_\_\_***(Based upon those households who reported household size)*

N=877

<i>Number of occupants in household</i>	<b>Regular Apples</b>	<b>Ecolabeled Apples<sup>a</sup></b>	<b>Some of both apples</b>	<b>No apples</b>	<b>Don't know</b>	<b>Refused</b>
<b>1</b>	37.0%	31.1%	15.6%	11.9%	4.4%	0.0%
<b>2</b>	33.8%	43.2%	11.9%	5.9%	4.9%	0.4%
<b>3</b>	34.3%	43.0%	15.7%	4.1%	2.3%	0.6%
<b>4</b>	31.7%	46.0%	14.3%	3.1%	5.0%	0.0%
<b>5 or more</b>	29.5%	43.4%	15.6%	7.4%	4.1%	0.0%

<sup>a</sup>Ecolabeled apples refer to both IPM and ECO apples.

**Table 27**

Percent respondents purchasing regular and ecolabeled apples when education level is:  
*(Based upon those householders who reported their education)*

N=875

<i>Education Level</i>	<b>Regular Apples</b>	<b>Ecolabeled Apples<sup>a</sup></b>	<b>Some of both apples</b>	<b>No apples</b>	<b>Don't know</b>	<b>Refused</b>
<b>Less than high school</b>	38.9%	22.2%	7.4%	22.2%	9.3%	0.0%
<b>High school graduate</b>	37.3%	41.0%	9.8%	6.6%	5.3%	0.0%
<b>Some college</b>	32.9%	42.7%	15.3%	5.1%	3.7%	0.4%
<b>College graduate and professional</b>	28.7%	46.2%	17.2%	4.0%	3.3%	0.7%

<sup>a</sup>Ecolabeled apples refer to both IPM and ECO apples.

**Table 28**

**Q: Where do you usually purchase fresh apples? (Open ended)**

<i>Location</i>	<b>Percent Respondents</b>
<b>Supermarket or grocery store</b>	89.7 %
<b>Farm, roadside stand or orchard</b>	5.3 %
<b>Farmer's Market</b>	3.4 %
<b>Green grocer or fruit specialty store</b>	0.7 %
<b>Bulk/Discount Store</b>	0.2 %
<b>Don't Know</b>	0.1 %
<b>Refused</b>	0.7%

**Table 29**  
**Percent respondents purchasing regular and ecolabeled apples at different shopping locations**

<i>Purchase location</i>	<b>Regular apples</b>	<b>Ecolabeled apples<sup>a</sup></b>	<b>Some of both apples</b>	<b>No apples</b>	<b>Don't know</b>	<b>Refused</b>
<b>Supermarket/ Grocery store</b>	34.0%	41.5%	13.8%	5.9%	4.5%	0.4%
<b>Other locations</b>	25.8%	43.0%	15.1%	9.7%	3.2%	3.2%

<sup>a</sup>Ecolabeled apples refer to both IPM and ECO apples.

**Table 30**  
**Q: When you buy apples, how often do you buy organic apples?**

<i>Response</i>	<b>Percent Respondents</b>
<b>Often or always</b>	2.9 %
<b>Rarely or occasionally</b>	15.3 %
<b>Do not buy them</b>	73.9 %
<b>Do not know</b>	7.5 %
<b>Refused</b>	0.3%

**Table 31**  
**Percent respondents purchasing regular and ecolabeled apples who normally buy organic apples versus those who do not**

<i>Respondent normally buys organic apples?</i>	<b>Regular apples</b>	<b>Ecolabeled apples<sup>a</sup></b>	<b>Some of both apples</b>	<b>No apples</b>	<b>Don't know</b>	<b>Refused</b>
<b>Yes</b>	23.1%	69.2%	3.4%	3.4%	0.0%	0.0%
<b>No</b>	33.5%	40.8%	14.2%	6.3%	4.5%	0.7%

<sup>a</sup>Ecolabeled apples refer to both IPM and ECO apples.

**Table 32****Q: How much have you seen, heard, or read about Integrated Pest Management or IPM?***(Note: This question given only to those receiving a scenario with IPM apples)*

N=404

<i>Response</i>	<b>Percent Respondents</b>
<b>A great deal</b>	2.7 %
<b>A fair amount</b>	4.2 %
<b>A little</b>	26.5 %
<b>Nothing</b>	66.3 %
<b>Don't Know</b>	0.2 %
<b>Refused</b>	0.0 %

**Table 33**

**Percent respondents purchasing regular and ecolabeled apples when familiar with the IPM claim versus those who are not**

<i>Respondent is familiar with IPM claim?</i>	<b>Regular apples</b>	<b>Ecolabeled apples<sup>a</sup></b>	<b>Some of both apples</b>	<b>No apples</b>	<b>Don't know</b>	<b>Refused</b>
<b>Yes</b>	53.6%	32.1%	3.6%	7.1%	3.6%	0.0%
<b>No</b>	35.5%	39.5%	14.1%	6.7%	4.3%	0.0%

<sup>a</sup>Ecolabeled apples refer to both IPM and ECO apples.

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## APPENDIX A: DEVELOPMENT OF ECOLABEL DESCRIPTIONS AND PRICES

The ecolabels presented in the questionnaire were developed over several months. Descriptions of ecolabels were pretested in personal interviews with consumers and refined based on the pretest results. Many rounds of pretests were conducted before the final wording was selected.

The initial set of ecolabels was created by examining existing agricultural ecolabeling programs in the U.S. These programs included the Massachusetts-IPM Partners with Nature Program, the Wegmans IPM label for canned corn and standards developed by California Clean Growers. Initially, we looked at three dimensions of the ecolabels: (1) whether process standards (i.e., production practices) or performance standards (i.e., environmental outcomes) were used to define the environmental claim, (2) how comprehensive the claim was (i.e., how many types of process or performance standards were specified), and (3) whether certification was performed and, if so, by whom. Initial label descriptions consisted of different combinations of standards, comprehensiveness, and certifiers. Examples of some of the initial ecolabel descriptions follow:

**Example 1:** Process standards which are non-comprehensive and producer certified

*Grown using Integrated Pest Management  
Grown with 33% less of Pesticide X  
Certified by the Smith Farms*

**Example 2:** Performance standards which are non-comprehensive and certified by the federal government

*Production resulted in 75% less nitrates in soil  
Superb rating on the Soil Health Index  
Certified by the USDA*

**Example 3:** Process standards which are comprehensive and certified by a well-known consumer group

*Used the safest fertilizers and pesticides on the market at the lowest possible levels  
Met 80% of the total points possible to qualify as IPM certified  
Produced in a manner which encourages healthy soil  
Produced with 60% less of chemicals X,Y, and Z  
Produced with 40% less irrigation water  
Grown using 30% less total energy (in Kilowatts)  
Certified by the Society for a Better America Consumer Group*

**Example 4:** Performance standards which are comprehensive and not certified

*Improved 50% on the Soil Nutrient Yardstick over previous year  
Doubled the number of Sandhill Crane and endangered Gray Wolves observed on the farm  
Water runoff from farm contained a 40% lower concentration of toxic residue than average levels in the county  
No detectable residues found upon this product  
Introduced four new species of rare wild flowers to farm  
Production resulted in 20% less on-farm solid waste than the year before  
Energy-efficient transport of this product resulted in 50% less air emissions*

**Example 5:** No process or performance standards and no certification

*This product grown with a commitment to preserving our environment*

Initial pretest interviews revealed that these descriptions were too complicated and confusing. Participants did not like being read a ‘laundry list’ of environmental attributes and thought the standards were very vague. We also learned from agricultural scientists that the development of performance standards was hampered by the current inability to measure environmental performance.<sup>11</sup> Consequently, we decided to omit the distinction between the process and performance standards. The pretests did indicate, however, that certification status and comprehensiveness of the claim were important in the purchasing decision. As a result, they were included as dimensions in the further rounds of ecolabel pretesting.

IPM ecolabel was chosen because several U.S. agricultural ecolabels are based upon IPM standards including Partners with Nature in Massachusetts and the Wegmans label on canned vegetables in New York state. These existing labels provided a framework within which to create the IPM description.<sup>12</sup>

The ECO ecolabel was created to see if consumers distinguish other farm-related environmental impacts. Unlike the IPM ecolabel, the ECO ecolabel was not based upon an existing ecolabel.

Food labels at local food stores provided examples of simple and clear language that respondents would recognize.<sup>13</sup> Labels were examined on fresh and frozen produce and juices, processed foods, health foods, and organic foods.

The final versions of the ecolabel began with a definition of IPM or ECO, depending upon which version the respondent received. This was followed by the environmental claim itself. The IPM claim was:

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<sup>11</sup> Discussions of these difficulties found in Riha, S., L. Levitan, and J. Hutson, “Environmental Impact Assessment: The Quest for a Holistic Picture,” *Proceedings of the Third National IPM Symposium, USDA, ERS, Washington, D.C., 1997* and Roberts, Wayne S., and Scott M. Swinton, “Economic Methods for Comparing Alternative Crop Production Systems: A Review of the Literature,” *American Journal of Alternative Agriculture*, 1996, 11(1):10-17.

<sup>12</sup> The IPM definition and practices mentioned in the claim were obtained from two websites and from the Wegman’s IPM label for canned corn. Valuable assistance was also provided by Mark Whalen, Entomology Dept. at MSU, Lois Levitan, Cornell University, Kurt Petzoldt with New York IPM, Cornell Extension Station and Laura Tourte, UC Davis-extension. Bill Coli at Umass at Amhurst and Bryan Hubbel at Univ. of Georgia at Athens provided assistance with the specific wording of the IPM claim.

<sup>13</sup> Stores visited consisted of several supermarkets, a farmer’s markets and an organic-oriented food co-op, the names of which are Meijers, Kroger, Save-A-Lot, and East Lansing Food Co-Op or ELFCO, and the Haslett Farmer’s Market.



*On the label it is stated that IPM means that the apples were grown using Integrated Pest Management. Signs and brochures in the store explain that IPM uses a number of different methods to prevent pest damage to fresh apples. These methods lower the need for environmentally harmful practices on the farm. For example, insects that damage apples are controlled by their natural enemies. Fields are monitored for pests to reduce unnecessary chemical usage. Apple varieties are planted which resist disease. When pesticides are needed, the least harmful are used.*

The ECO claim was:

*Signs and brochures in the store explain that “ECO-apples” are grown using techniques based on environmental principles. These techniques result in more efficient use of water and energy. They include the use of naturally occurring fertilizers to protect water and soil quality. When possible, natural insect control methods are used to prevent pest damage on fresh apples. Man-made pesticides are used only as a last resort.*

To help respondents visualize the ecolabel, a physical description was provided. The size, shape, color and lettering upon the label were described. Respondents were told that the letters on the label were IPM [or ECO] in capital letters. We included three capital letters on all versions of the ecolabel to ensure that the letter size would not affect demand.

The regular apple prices used in the market scenarios were chosen based upon U.S. apple data. Retail apple prices from the months in which the survey was given, November through February, were averaged over the last five years of available data (1992-1996) resulting in a figure of \$.88 per pound.<sup>14</sup> A central price of \$.89 per pound was identified because most apples in the U.S. are sold at a price which ends in ‘9’ on a per pound basis.<sup>15</sup> Two additional prices were then chosen on either side of this figure at \$.30 increments to represent variation about the average U.S. apple price.

Prices for the ecolabeled apple were selected by looking at the market for organic apples. In van Ravenswaay and Blend (1997), it was suggested that ecolabeled apples would best capture a significant portion of the apple market by providing a cheaper environmental alternative to organic. Thus, the ecolabeled apple prices used in our market scenario were kept at or below the lowest organic prices.

In order to determine the lowest prices for organic apples, a price range was identified. This was done by looking at prices in the Lansing area and referring to studies by Jolly (1989 and 1991) and Hammitt (1986) who calculated price premiums for organic apples in California.<sup>16</sup> The lowest prices

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<sup>14</sup>All prices given are in December, 1997 dollars.

<sup>15</sup>It was decided from earlier work (van Ravenswaay and Hoehn, 1991) that the prices given would be on a per pound basis since this was the most common way respondents understood them.

<sup>16</sup>Stores visited included East Lansing Food Co-op, Kroger grocery store, and the Haslett Farmer’s Market)

for organic apples were about \$1.39-\$1.49 per pound.<sup>17</sup> This was set as an approximate upper bound price for the ecolabeled apples.

Because the highest price for regular apples was \$1.19/lb, the price premium on ecolabeled apples could be no greater than 30 or 40 cents per pound if it were to stay roughly within its bound. Thus, the highest premium was set at \$.40/lb. The lowest premium was set at zero cents (i.e., same price for regular and ecolabeled apples) so that an estimate could be made of the difference in demand between ecolabeled and regular brands, *ceteris paribus*. A third premium was set halfway between these two at \$.20/lb.

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<sup>17</sup>It was found that organic prices ranged from \$1.50/lb up to \$2.50 per pound from the sources consulted. The lower prices were from price data reported in Hammitt and Jolly. The highest price was seen at the local food co-op.

## APPENDIX B: SAMPLE SELECTION

The Institute of Public Policy and Social Research (IPPSR) at Michigan State University conducted the survey interviews. IPPSR purchased the phone numbers from Gensys Sampling Inc. who randomly generated 3945 numbers from a straight 48 state proportional sample.

IPPSR assigned a five digit case ID number to each phone number. Each ID number was then randomly assigned to one of the 36 survey versions. In this way, approximately equal numbers of respondents received each survey version.

IPPSR dialed up the phone numbers until they obtained the desired sample size. The calls were placed between November 3, 1997 and February 11, 1998 and the survey interviews lasted an average of 7 minutes. Of the 3203 numbers dialed, 1453 reached households with persons who were eligible for participation in the survey.<sup>18</sup> Of these eligible cases, 972 interviews were completed resulting in a participation rate of 66.9 % (972/1453). Of the eligible households, there were 393 refusals. One thousand seven hundred and fifty numbers or 54.6% of those dialed were ineligible for participation. One thousand three hundred and twelve of the ineligible numbers consisted of business lines, FAX or computer numbers and verified non-working numbers. Three hundred and twenty-nine could not be contacted because either no one answered or the line was constantly busy after 20 attempts. One hundred thirty seven of the ineligible numbers reached respondents with physical handicaps and language barriers, those who were too young (teenager lines) and those who were absent during the study period.

The household composition of the sample was somewhat different from the national average (Table 5). The average household size in our sample was 2.87 as compared to the national average of 2.65.<sup>19</sup> The percentage of households in our sample with children under 18 was 42.2% which is greater than the national average of 34.3%. The percentage of single-person households in our sample was 16.8% compared to the national average of 24.9%.

The ages of the householders in our sample were similar to census figures (Table 6). Householders with some college or completed college degrees were over-represented while those with less than a high school education were under-represented (Table 7). Females made up 75.0% of our sample and males 25.0% (Table 8). When asked about household income (Table 9), 19.9% of the sample either refused to report that information or did not know their income. Of the households that did report income, both the '\$10,000-\$49,000' and 'Over \$50,000' categories were over-represented while the "under \$10,000" category was under-represented.

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<sup>18</sup>Eligibility required the number to be that of a residential household and that the person who purchases food for the household be 18 years or older.

<sup>19</sup> These figures taken from U.S. Bureau of the Census, 1996. Statistical Abstract of the United States: 1996 (116<sup>th</sup> edition) Washington, D.C., 1996, pp. 60, 160, 61, and 465.

## APPENDIX C: SURVEY INSTRUMENT

Hello, my name is \_\_\_\_\_ and I am calling from the Institute of Public Policy and Social Research at Michigan State University. Is this (phone number)?

We are calling on behalf of the Agricultural Economics Department at Michigan State University. We are conducting a national survey of food consumers. May I speak to the person who usually does the food shopping for your household? Thank you.

The survey takes about 7 minutes. Before we begin, let me tell you that any information you give me will be kept strictly confidential. Let me also tell you that this interview is completely voluntary. Should we come to any question that you don't want to answer, just let me know and we'll go on to the next question.

I'd like to start by asking you some general questions about the fresh apples you may buy for your household. By fresh apples, I am referring only to raw apples. When answering the following questions, do not include canned or processed apples, apple juice, apple sauce, or cider. Fresh apples are in season in late summer and early fall.

Q1. Do you buy fresh apples for your household? [IF THEY ASK WHAT IS MEANT BY HOUSEHOLD: Your household includes yourself, your dependents, and persons with whom you share income and household living expenses.]

1. Yes---[GO TO Q3]
5. No---[GO TO Q2]
8. Don't know
9. Refused---[GO TO Q3]

Q2. Could you tell me why you do not buy fresh apples for your household? (ALLOW 2 CHOICES)

1. My household does not like/eat apples
2. Apples are too expensive
3. Apples are not available
4. Apples are unsafe or unhealthy
5. Other (Specify\_\_\_\_\_)
90. Do buy apples, but only in season or only occasionally--[GO TO Q3]
98. Don't Know
99. Refused

GO TO Q17

Q3. Where do you usually purchase apples?

1. Supermarket, grocery, or convenience store
2. Farmer's market
3. Farm, roadside stand, orchard, or cider mill
4. Green grocer or fruit specialty store
5. Organic food store or cooperative
6. Other (Specify\_\_\_\_\_)
8. Don't know
9. Refused

Q4. Have you ever bought organic apples?

1. Yes---[GO TO Q4a]
5. No---[GOTO Q5]
8. Don't Know---[GOTO Q5]
9. Refused---[GOTO Q5]

Q4a. When you buy apples, how often do you buy organic apples? Would you say rarely, occasionally, often, or always?

1. Rarely
2. Occasionally
3. Often
4. Always
8. Do not know
9. Refused

Q5. How much have you seen, heard, or read about Integrated Pest Management or IPM?

1. Nothing
2. A little
3. A fair amount
4. A great deal
8. Don't know
9. Refused

Q6 Imagine you are at the place where you normally buy fresh apples, and you are planning to buy some. Suppose that all apple varieties and sizes are the same price per pound whether displayed individually or packaged in bags, boxes, or bushels. All your favorite varieties are on display and are of the size and quality you prefer. There are no special sales on any other fresh fruits. If the price of apples was \_\_\_\_\_ per pound and no other place was selling them for less, would you buy any apples?

1. Yes---[GOTO Q7]
5. No----[GOTO Q6a]
8. Don't know---[GO TO Q10]
9. Refused---[GO TO Q10]

Q6a. Why would you not buy any apples?

1. Too expensive---[GO TO Q8]
2. Other (Specify\_\_\_\_)---[GO TO Q8]
9. Respondent contradicts what was read in scenario, Specify (\_\_\_\_)--- [GO TO Q6b]
98. Do not know---[GO TO Q8]
99. Refused---[GO TO Q8]

Q6b. If \_\_\_\_\_ [INSERT RESPONDENT'S CONTRADICTION FROM Q6a] was not a factor, and if the price of apples was [INSERT PRICE FROM Q6] \_\_\_\_ per pound, would you buy any apples?

1. Yes---[GO TO Q7]
5. No---[GO TO Q8]
8. Don't know
9. Refused

Q7. How much would you buy?

RECORD NUMBER and UNITS

Q8. If you were in exactly the same setting, and the price of apples was \_\_\_\_\_ per pound, would you buy any apples?

1. Yes---[GO TO Q9]
5. No----[GO TO Q10]
8. Don't know---[GO TO Q10]
9. Refused---[GO TO Q10]

Q9. How much would you buy?

RECORD NUMBER and UNITS

Q10. *[There are four versions to Q10. Respondents are assigned randomly to receive one of these version. Versions 1 and 3 present the respondent with an IPM ecolabel and versions 2 and 4 present the respondent with an “ECO” ecolabel. Versions 1 and 2 include the statement that the ecolabel is certified by the USDA, whereas versions 3 and 4 do not.]*

[VERSIONS 1 AND 3 OF Q10, WITH IPM ECOLABEL]

Imagine you are in the same setting and you notice something new at your store. Your store sells the same apples it always has and apples grown a new way. The apples grown the new way have small, round half-inch wide labels that have a white background and green lettering.

The letters on the label are IPM in capital letters. [The label states that IPM apples are certified by the USDA to have been grown and handled according to government standards.] On the label it is stated that IPM means that the apples were grown using Integrated Pest Management. Signs and brochures in the store explain that IPM uses a number of different methods to prevent pest damage to fresh apples.

These methods lower the need for environmentally harmful practices on the farm. For example, insects that damage apples are controlled by their natural enemies. Fields are monitored for pests to reduce unnecessary chemical usage. Apple varieties are planted which resist disease. When pesticides are needed, the least harmful are used.

You are planning to buy fresh apples of the size and quality you prefer. The price of the regular apples is the same as before, (INSERT PRICE FROM Q6) \_\_\_\_\_ per pound and the price of the [Certified] IPM apples is \_\_\_\_\_ per pound. Would you buy the regular apples, the IPM apples, some of both, or none at all?

1. Regular only---[GO TO Q10a]
2. IPM only---[GO TO Q10b]
3. Some of both---[GO TO Q10a]
4. None at all---[GO TO Q15]
8. Don't know---[GO TO Q16]
9. Refused---[GO TO Q16]

*[The bracketed sentence involving USDA certification of IPM and the bracketed word “certified” are included only in version 1 of the apple scenario. They are not included in version 3]*

Q10

[VERSIONS 2 AND 4 WITH THE “ECO” ECOLABEL]

Imagine you are in the same setting and you notice something new at your store. Your store sells the same apples it always has and apples grown a new way. The apples grown the new way have small, round half-inch wide labels that have a white background and green lettering.

The letters on the label are E C O or “Eco” in capital letters. [The label states that ECO-apples are certified by the USDA to have been grown and handled according to government standards.]

Signs and brochures in the store explain that “ECO-apples” are grown using techniques based on environmental principles. These techniques result in more efficient use of water and energy. They include the use of naturally occurring fertilizers to protect water and soil quality. When possible, natural insect control methods are used to prevent pest damage on fresh apples. Man-made pesticides are used only as a last resort.

You are planning to buy fresh apples of the size and quality you would prefer. The price of the regular apples is the same as before, (INSERT PRICE FROM Q6) \_\_\_\_\_ per pound and the price of the [Certified] ECO-apples is \_\_\_\_\_ per pound. Would you buy the regular apples, the ECO-apples, some of both, or none at all?

1. Regular only---[GO TO Q10a]
2. IPM only---[GO TO Q10b]
3. Some of both---[GO TO Q10a]
4. None at all---[GO TO Q13]
8. Don't know---[GO TO Q17]
9. Refused---[GO TO Q17]

*[The bracketed sentence involving government certification of ECOapples and the bracketed word “certified” will be included only in version 2 of the apple scenario. It will not be included in version 4]*

Q10a. How much of the regular apples would you buy?

RECORD NUMBER AND UNITS (if blank record zero)

Q10b. How much of the IPM apples would you buy?

RECORD NUMBER AND UNITS (if blank record zero)

Q11 Why would you buy the [IPM/ECO] apples? (Open-ended) (Allow up to 3 choices)

1. IPM apples are better for the environment
2. I care about future generations/future of our planet
3. IPM apples are safer and healthier for my family and myself
4. To avoid chemicals in my food
5. Feels good/feels like I'm doing something good
6. Other (Specify\_\_\_\_\_)
8. Don't know
9. Refused



Q12 Why would you not buy the [IPM/Eco] apples? (Open-ended) (Allow up to 3 choices)

1. They are too expensive/Not worth it---[GO TO Q13]
2. The regular apples are just as safe/healthy for my family---[GO TO Q13]
3. I do not trust/believe the IPM label---[GO TO Q13]
4. I do not know enough about IPM to buy them---[GO TO Q13]
5. IPM is an advertising gimmick---[GO TO Q13]
6. Other (Specify\_\_\_\_\_)---[GO TO Q13]
90. Respondent contradicts what was read in scenario, Specify (\_\_\_\_)---[GO TO Q12a]
98. Do not know---[GO TO Q13]
99. Refused---[GO TO Q13]

Q12a Imagine that this (INSERT RESPONDENT'S CONTRADICTION FROM Q12) is not a factor. The price of the regular apples is the same as before, (INSERT PRICES FROM Q10) \_\_\_\_\_ per pound, and the price of the [Certified] ECO-apples is \_\_\_\_\_ per pound. Would you buy the regular apples, the ECO-apples, some of both, or none at all?

1. Regular only---[GO TO Q10a]
2. IPM only---[GO TO Q10b]
3. Some of both---[GO TO Q10a]
4. None at all---[GO TO Q13]
8. Don't know---[GO TO Q17]
9. Refused---[GO TO Q17]

Q13 Suppose that the price of the regular apples is the same as before, [INSERT THE PRICE GIVEN FROM Q6] \_\_\_\_\_ per pound and no other place is selling them for less. The price of the [IPM/Eco] apples is now \_\_\_\_\_ per pound. Would you buy the regular apples, the IPM/Eco apples, some of both, or none at all?

1. Regular only---[GO TO Q13a]
2. IPM only---[GO TO Q13b]
3. Some of both---[GO TO Q13a]
4. None at all---[GO TO Q17]
8. Don't know---[GO TO Q17]
9. Refused---[GO TO Q17]

Q13a. How much of the regular apples would you buy?

RECORD NUMBER AND UNITS (if blank record zero)

Q13b. How much of the IPM apples would you buy?

RECORD NUMBER AND UNITS (if blank record zero)

## DEMOGRAPHIC QUESTIONS

*[If they answered yes to Q1, then use the following statement only. If they answered no to Q1, then use the following statement and add on the alternate statement]*

These last few questions for statistical purposes only and cannot be linked to you in any way.

*[If they answered no to Q1, then use the following statement]*

Although you do not buy apples for your household, this information is still valuable to the survey.

Q17. Are you male or female? [ASK ONLY IF IN DOUBT] (Circle one)

1. Female

2. Male

Q18a. Including yourself, how many people in your household are in the following age categories? (Write in the numbers)

Under 5 years?

<0-10> Under 5 years

<98> Don't Know

<99> Refused

Q18b. 5 to 17 years?

<0-10> 5 to 17 years

<98> Don't Know

<99> Refused

Q18c. 18 to 64 years?

<0-10> 18 to 64 years

<98> Don't Know

<99> Refused

Q18d. 65 years or older?

<0-10> 65 or older

<98> Don't Know

<99> Refused

Q19. In what year were you born?

- 19 <00-79> YEAR BORN
- 18 <90-99> YEAR BORN
- <998> Don't know
- <999> Refused

Q20. Please indicate the highest level of education you have completed. (Circle one).

- 0. Did not go to school
- 1-11. Grade school
- 12. High school graduate or GED holder
- 13-15. Some college (One to three years)
- 16. College Graduate (Four years)
- 17. Some graduate school or professional (law, medical) school
- 18. Graduate degree
- 20. Technical School or Junior College Graduate
- 98. Do not know
- 99. Refused

To find out if people with different financial situations make different food choices, we'd like to know the general range of incomes of all households we interview. Your answers will be kept strictly confidential.

Q21. Now, thinking about your household's total annual income from all sources (including your job), did you household receive \$30,000 or more in 1996? (Circle one)

- 1. Yes (\$30,000 OR MORE) [GO TO INC4]
- 5. No (Less than \$30,000) [GO TO INC2]
- 98. DON'T KNOW-NO OPINION
- 99. REFUSED-NO ANSWER

>INC2< Was it \$20,000 or more?

- 0. NOT APPLICABLE
- 1. Yes (\$20,000 - 29,999)
- 5. No (LESS THAN \$20,000)
- 98. DON'T KNOW-NO OPINION
- 99. REFUSED-NO ANSWER

>INC3< Was it \$10,000 or more?

- 0. NOT APPLICABLE
- 1. Yes (\$10,000 - 19,999)
- 5. No (LESS THAN \$10,000)
- 98. DON'T KNOW-NO OPINION
- 99. REFUSED-NO ANSWER

>INC4< Was it \$60,000 or more?

- 0. NOT APPLICABLE
- 1. Yes (more than \$60,000)[goto INC7]
- 5. No (more than \$30,000 and less than \$60,000)[goto INC5]
- 98. DON'T KNOW-NO OPINION
- 99. REFUSED-NO ANSWER

>INC5< Was it \$40,000 or more?

- 0. NOT APPLICABLE
- 1. Yes (\$40,000 or more)[goto INC6]
- 5. No (\$30,000 - \$39,999)
- 98. DON'T KNOW-NO OPINION
- 99. REFUSED-NO ANSWER

>INC6< Was it \$50,000 or more?

- 0. NOT APPLICABLE
- 1. Yes (\$50,000 - 59,999)
- 5. No (\$40,000 LESS THAN \$49,999)
- 98. DON'T KNOW-NO OPINION
- 99. REFUSED-NO ANSWER

>INC7< Was it \$80,000 or more?

- 0. NOT APPLICABLE
- 1. Yes (\$80,000 or more)[goto INC9]
- 5. No (More than \$60,000 LESS THAN \$79,999) [goto INC8]
- 98. DON'T KNOW-NO OPINION
- 99. REFUSED-NO ANSWER

>INC8< Was it \$70,000 or more?

- 0. NOT APPLICABLE
- 1. Yes (\$70,000 - 79,999)
- 5. No (\$60,000-\$69,999)
- 98. DON'T KNOW-NO OPINION
- 99. REFUSED-NO ANSWER

>INC9< Was it \$100,000 or more?

- 0. NOT APPLICABLE
- 1. Yes (\$100,000 or more)[goto INC11]
- 5. No (\$80,000-\$99,999)[goto INC10]
- 98. DON'T KNOW-NO OPINION
- 99. REFUSED-NO ANSWER

INC10 Was it \$90,000 or more?

- 0. NOT APPLICABLE
- 1. Yes (\$90,000 - 99,999)
- 5. No (\$80,000-\$89,999)
- 98. DON'T KNOW-NO OPINION
- 99. REFUSED-NO ANSWER

INC11< Was it \$110,000 or more?

- 0. NOT APPLICABLE
- 1. Yes (\$110,000 - or more)
- 5. No (\$100,000-\$109,999)
- 98. DON'T KNOW-NO OPINION
- 99. REFUSED-NO ANSWER

>NC12< Was it \$150,000 or more?

- 0. NOT APPLICABLE
- 1. Yes (\$150,000 to \$200,000)
- 5. No (\$110,000-\$149,999)
- 98. DON'T KNOW-NO OPINION
- 99. REFUSED-NO ANSWER

>NC13< Was it \$200,000 or more?

- 0. NOT APPLICABLE
- 1. Yes (\$200,000 or more)
- 5. No (\$150,000-\$199,999)
- 98. DON'T KNOW-NO OPINION
- 99. REFUSED-NO ANSWER