

ORGANIC FOOD: IDENTIFYING ACTIONABLE SEGMENTS

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ABSTRACT

The purpose of this study is to identify the segments for organic fruits and vegetables that are most likely to buy organic. One thousand and thirty-two respondents were segmented on statements about organic fruits and vegetables: price, quality, availability, variety, and purchase intentions. Latent class clustering was used to identify the segments and actionable demographic variables. A three-cluster solution reveals age, gender, prior organic fruit purchase, and knowledge differ by segment. Younger knowledgeable (i.e., organic food and vegetables and general food and vegetable knowledge) females who have purchased organic before have the highest propensity to purchase organic. Education and household size were indistinguishable among segments. However it appears that price is still an obstacle to greater penetration regardless of the segment.

Keywords: Organic Food; Actionable Segments

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Introduction

According to the United States Department of Agriculture, “organic operations must demonstrate that they are protecting natural resources, conserving biodiversity, and using only approved substances” (The United States Department of Agriculture, 2017). For organic crops, “All labels and marketing materials that use the USDA organic seal in association with certified products

must be reviewed and approved by a USDA-accredited certifying agent before being used in the marketplace.” (The United States Department of Agriculture, 2016). Labeling makes identification by consumers easier. The Food Business News (2017) reported 2016 sales of U.S. organic products jumped 8.4 percent to \$43 billion. Global sales are estimated at \$63 billion in 2020 (AG Professional 2015).

Literature Review

The average price premium consumers were willing to pay for organic food in studies from 2000 to 2014 is around 30 percent (Aschemann-Witzel and Zielke 2017). Credence attributes, such as production method, and country of origin have influenced consumers’ purchases of fresh fruit. When credence factors are linked with quality, consumers will pay a premium for healthier and safer foods (Batte et al. 2007; Gao and Schroder 2009; Gao, Wong, House, and Spreen 2014). Organic production is a credence attribute. The type of organic food and industry promotional intensity influence purchase (i.e., extensive category price and promotion competition) (Steenkamp, van Heerde, and Geyskens 2010). Fresh and virtuous (e.g., bread, cereals, dairy, vegetables, and fruit) categories see greater organic purchase than processed and vice (e.g., alcohol, cheese, cookies) categories (Van Doorn and Verhoef 2015). Purchasing organic in some categories leads to purchase in others (Juhl, Fenger, and Thøgersen 2017).

For most, healthy content is the main reason for purchasing organic food (Nasir and Karakaya 2014; Paul and Rana 2012; Oraman and Unakitan 2010; Salleh et al. 2010; Wier and Calverley 2002). Purchase intentions increase the more people (Malaysian study) believe consuming organic food is healthy and safe (Ahmad and Juhdi 2010). Barriers exist to organic food purchase including price, appearance, and trust. A barrier to organic food purchases is high price (Akaichi, Nayga and Gil 2012; Radman 2005; Govindasamy and Italia 1999; Jones 2000; Mayfield et al. 2001). Lodorfos and Dennis (2008) found if prices for organic and conventional food were the same, organics would be purchased more. In an experimental auction, health (healthy for children and adequate for a safe diet) was the most important factor in consumers’ willingness to pay a premium for organic food (Akaichi, Nayga, Jr. and Gil 2012).

Appearance may also detract from organic food purchases (Radman 2005). “Organic apples, for example, may be slightly smaller, of unstandardized size, or may display a few stains or even pest marks,” unlike non-organics where unstandardized sizes are discarded and pesticide and chemicals employed to improve appearances (IFORM 2013).

Variables that influence organic food consumption include age, knowledge, education, gender, income, and children. Health considerations influence older consumers more than younger, who are influenced more by environmental factors (Wandel and Bugge 1997). However, older individuals purchase organic less than younger individuals (Onyango, Hallman, and Bellows 2007; Rimal, Moon, and Balasubramanian 2006), who are willing to pay a premium for

pesticide-free food (Cranfield and Magnusson 2003) but may be limited by income (Stobbelaar et al. 2007). Many older consumers believe the damage to their bodies is already done (Connor and Douglas 2001), but other studies found them willing to switch for health-related reasons (Cranfield and Magnusson 2003; Sangkumchaliang and Huang 2012).

Women have a higher propensity to purchase organic than men (Aguirre 2007; Mathisson and Schollin 1994; Onyango, Hallman, and Bellows 2007; Wandel and Bugge 1997). Higher education levels also increased the propensity to purchase (Dettmann and Dimitri 2014; Cranfield and Magnusson 2003; Krystallis, Fotopoulos, and Zotos 2006; Sangkumchaliang and Huang 2012; Wandel and Bugge 1997), but other studies show a negative relationship, possibly because they see no food-safety problem or are unwilling to pay a price premium (Govindasamy and Italia 1999; Quah and Tan 2010; Thompson and Kidwell 1998).

Income positively correlates with organic food purchase (Oraman and Unakitan 2010; Aryal et al. 2009; Cranfield and Magnusson 2003; Quah and Tan 2010; Thompson and Kidwell 1998; von Alvensleben and Altmann 1987). This relationship was nuanced in another study where household income and organic vegetable purchases were positively correlated, but these households did not allocate a large share of expenditures to organic vegetables (Dettmann and Dimitri 2014).

However, in another study, the probability of being a regular organic food consumer and household income were unrelated, although it did affect organic food expenditures (Kriwy and Mecking, 2012). The likelihood of purchasing organic products increases with higher education and income, marriage, and access to organic food (Dimitri and Dettmann 2012). One study found no relationship between purchase intentions for organic food and education, income, and gender (Nasir and Karakaya 2013).

The number of children in the household has shown a negative relationship with organic food purchases (Cranfield and Magnusson 2003; Loureiro, McCluskey and Mittelhammer 2001), because larger families incur larger expenses: food, medical, clothing, etc., but the presence of children under 18 had a positive effect (Thompson and Kidwell 1998). Merely the presence of children in the household did increase purchase likelihood (Ward et al. 2012). Overall, higher purchase intentions for organics are related to age (young), education (higher), gender (females), income (higher) and children (presence of) (Govindasamy and Italia 1999).

Many groups are willing to pay a premium for organic food. College-educated females in their 40s with an optimistic opinion toward the necessity of organic farming tend to pay a premium for and buy organic food. Consumers were willing to pay a premium for organic milk in an experimental auction; however, this decreased as purchases increased suggesting that promotional discounts may be necessary to sell additional units (Akaichi, Nayga, Jr., and Gil

2012). Habitual and knowledgeable purchasers of organic food are more willing to pay a price premium than non-consumers with little knowledge, although the gap diminishes as the premium increases (Dias et al. 2012). An inverted u-shaped relationship has been shown to exist between age and organic food consumption (Kriwy and Mecking 2012).

The literature cited is either implicitly or explicitly positing a theory of behavior that suggests that positive changes in beliefs lead to positive changes in intentions or behavior. The Theory of Planned Behavior (TPB) aims to explain volitional choice; that is, actions that the individual intends to make (Ajzen 1991). TPB is an extension of The Theory of Reasoned Action (TRA), proposed by Fishbein and Ajzen (1975). Both TRB and TRA posit that behavioral intentions are the outcome of individuals' cognitive processing of beliefs about the behaviors under consideration, such as the purchase of locally grown produce. Both theories conceive intention as a motivational construct indicating the amount of effort the individual is willing to expend to complete an action (Bagozzi and Warshaw, 1990). These models are ubiquitous in the literature and need not be represented here.

The Theory of Planned Behavior (TPB) (Ajzen 1991) has been used to understand intentions to purchase (Dean 2012), and the results indicate that moral norms, self-identity, and past behavior are linked to purchase intentions. Kim and Chung (2011) found all TPB predictors, along with perceived behavioral control, statistically significant with intention to buy organic skin/hair care products. Chen and Lobo (2012), using TPB as its conceptual model, found Chinese consumers' organic food purchases influenced by the product (i.e., sensory appeal including texture, looks, smell, and price perception: high nutritional value), government regulations and distribution, and variety seeking and self-indulgence (positive impact for both). Purchase intentions for organic food in one study were predicted by attitude, subjective norm, and perceived behavioral control (Lodorfos and Dennis 2008). However, as will be demonstrated, there is great variation in who buys organic, why they buy them, and what benefits and attributes buyers seek. The purpose of this research is to demonstrate that there is a greater commonality among various groups of organic purchasers when a segmentation methodology is employed. Segmentation makes marketing of organic food more efficient and more effective.

Hypotheses

Four separate hypotheses are developed to provide a basis for segmentation. We examine perceptions about organic fruits and vegetables and not the underlying motivations for consumption. We examined respondents' self-reported knowledge about fruits and vegetables in general (quality and safety) and their knowledge about organic fruits and vegetables. As an alternative to examining by individual, cluster analysis was used to determine whether there were distinct groups of similar consumers based on their perceptions (six statements) about organic fruits and vegetables. These statements compare organic and conventional fruits and vegetables

on safety, quality, variety, and price and purchase intentions for organic fruits and vegetables based on availability and price.

Segments were then analyzed to see which demographic variables were associated with cluster membership. This information will assist in creating a marketing campaign that is more efficient and effective than a mass approach. We propose the following demographic variables will differ across segments: age, education, gender, household income, and the presence of children under 18 in the household. Based on the previous research, the following hypotheses are proposed to understand the perceptions about organic fruits and vegetables.

H_{01a}: Segments will differ on perceptions about organic fruits and vegetables and a comparison of conventional and organic fruits and vegetables (four statements).

H_{01b}: Segments will differ on actionable demographic variables (i.e., age, education, gender, household income, and number of children).

H_{01c}: Segments will differ on whether they have tried organic fruits and vegetables.

H_{01d}: Knowledge about fruits and vegetable (i.e., general and organic) will differ by segment.

Research Methodology

The sample was drawn from an Internet panel maintained by e-Rewards, Inc. The panelists are recruited via methods such as banner ads and e-mail invitations and compensated for participation. Panel managers limit the number of surveys members complete and have systems to eliminate fraudulent respondents. Internal questions were used to rule out respondents that did not meet the screening requirements, and the actual time to take the test and analysis of responses was used to eliminate “speeders.”

The six-item knowledge scale was factor analyzed, and two factors were anticipated. A three-item scale measures general product knowledge about fruits and vegetables, with not at all (1) to extremely (7) as anchors, and organic knowledge is a three-item scale, with anchors of very little (1) to very much (5). Summed scales were created. The general product knowledge scale goes from three (low) to 21 (high). The organic scale goes from three (low) to 15 (high).

Once unidimensionality was examined through factor analysis, reliability was assessed through Coefficient Alpha. Factor analysis determines whether multi-item scales exist (Lattin, Carroll and Green 2003). The factorability of the data set was determined by sample size (above 300 being good), high bivariate correlations, (excess of .30), Kaiser-Meyer-Olkin Measure of Sampling Adequacy (above .6), Bartlett’s Test of Sphericity (significant at the .05 level), and Anti-image Matrix (small off-diagonal values) (Hair et al. 2010). Eigenvalues greater than one

and a Scree plot (eigenvalues by components where an elbow forms) is used to determine the number of factors. Coefficient Alpha was calculated for fruit and vegetable and knowledge statements. Alpha values of .70, an indicator of reliability, are also adequate in the early stages of predictive or construct validation research (Nunnally and Bernstein 1994). Scales were created by summing the items.

Latent Class Cluster Analysis (LCCA) (Wedel and Kamakura 2000) was used to determine how many clusters existed within the benefit statements. Latent Class Models have been used for food preference (Baglione, Tucci, and Stanton 2012; Semenou et al. 2007). LCCA, unlike other clustering methods, offers an objective means of determining the optimal number of clusters via the Bayesian Information Criterion (BIC) statistic. The optimal number is indicated by the cluster solution with the smallest BIC value (Bartholomew et al. 2008). Also, the BIC imposes a penalty for overfitting (i.e., increase the likelihood by adding parameters). Respondents were assigned to a cluster based on the highest estimated probability of belonging to that cluster. L^2 (chi-squared measure) is examined, where the “ L^2 for that model is not substantially larger than the degrees of freedom which is the expected value for L^2 under the assumption that 1) the model is true and 2) L^2 follow a chi-square distribution” (Vermunt and Magidson 2005). Misclassification, assignment to the class having the highest membership probability, should be close to zero. Bivariate residuals should be less than one (Vermunt and Magidson 2005). Next, cluster profiles were examined: demographic or behavioral variables associated with cluster membership. In LCCA, these variables are termed covariates.

Results

One-thousand two-hundred and twenty-four respondents were surveyed. After eliminating respondents with missing data and outliers, the sample size was 1,032. The sample is predominately married (67%), female (59%), from the suburbs (64%), and working full-time (64%), with more than two-thirds having household incomes above \$60,000 annually (Table 1). Sixty-two percent of respondents have purchased USDA certified organic fresh fruits and vegetables, and eighty-one percent consciously eat healthy foods. (Note: The number of children below the age of 18 was excluded from the analysis for low variability, since 86 percent of respondents have children).

TABLE 1: DEMOGRAPHICS

<i>Variable</i>	<i>Percentage</i>
<i>Age</i>	
19-20	31
21-35	13
36-40	26
41-50	26
51-65	4

<i>Area</i>	
Urban	15
Suburban	64
Rural	21
<i>Children Under 18 in Household</i>	
Yes	86
<i>Education</i>	
Some high school	.1
High school graduate	10
Some college	22
College graduate	35
Some graduate school	8
Master's degree	18
Doctoral degree	6
<i>Household Income</i>	
Less than \$20,000	3
\$20,000 to \$39,999	12
\$40,000 to \$59,999	18
\$60,000 to \$79,999	21
\$80,000 to \$99,999	18
\$100,000 or more	28

The six-item knowledge questions were factor analyzed (Table 2). The model is factorable since the Kaiser-Meyer-Olkin measure is .77, Bartlett's Test of Sphericity is significant at the .000 level, but two values in the Anti-image Matrix are above .4. The correlation matrix has many large bivariate correlations. Principal Components extracted a minimum of 58 percent of the variability for each manifest variable (Table C). Two dimensions were extracted accounting for 72 percent of the variability. The scales were computed by adding each respondent's scores on the items. Coefficient Alpha is .71 for the general scale and .84 for the organic, indicating reliability for the factors.

TABLE 2: FACTOR ANALYSIS (knowledge)

Scale	Factor Loading (organic)	Factor Loading (general)	Extraction (variance explained)
<i>Overall $\alpha = .71$</i>			

How knowledgeable are you about the quality of fresh fruit and vegetables? ¹	.59	.58
How concerned are you about food safety?	.88	.76
How knowledgeable are you about fresh fruit and vegetable safety issues?	.74	.75
Overall $\alpha = .84$		
How much do you feel you know about organic fruits and vegetables? ²	.89	.84
Compared to your friends and acquaintances, how much do you feel you know about organic fruits and vegetables?	.84	.74
Compared to an organic fruits and vegetables expert, how much do you feel you know about organic fruits and vegetables?	.79	.64

¹ Scale: 1 (not at all) to 7 (extremely)

² Scale: 1 (very little) to 5 (very much)

Given our large sample size (n=1032), we estimated two- to nine-cluster models. All have statistically non-significant L^2 , which is good. The BIC is smallest for the six-cluster solution. The misclassification rate, however, is 17 percent. Misclassification, assignment to the class having the highest membership probability, should be close to zero. None of the bivariate residuals for the six-cluster solution is above one (total of nine). The BIC for the three-cluster solution is only 86 points lower than the six-cluster solution, and the misclassification rate is 11 percent. The three-cluster solution is estimated with covariates because it is more parsimonious and has a smaller misclassification rate. Three bivariate residuals are above one. Finally, the three-cluster solution was more interpretable.

The model explains at least 14 percent of the variation in each claim, with a high of 48 percent (Table 4). Respondents see no difference in safety between conventional and organic fruits and vegetables, although the quality or organic is perceived superior. Organic would be purchased more if cheaper and more readily available. Variety is perceived as better for conventional over organic.

The following covariates were statistically significant across clusters: age, gender, knowledge (both factors), and whether they purchased organic in the past. Education and household income did not differ across clusters and were dropped from the analysis.

Hypothesis H_{01a} is supported since the four health claims do differ by segment. Hypothesis H_{01b} is partially supported since segments did not differ on age and household income. Hypothesis H_{01c} is supported since segments differ on whether they have tried organic fruits and vegetables.

Hypothesis H_{01d} is supported, since segments different on general and organic knowledge about fruits and vegetables. Respondents differ on general and organic knowledge.

TABLE 3: CLUSTER SOLUTION (means and percentages)

<i>Question/Covariate</i>	<i>Wald</i>	<i>p-value</i>	<i>R²</i>
1) There is basically no difference between the safety of conventional and organic fruits and vegetables. ¹	88.95	4.8e-20	.14
2) I would buy more organic fruits and vegetables if they were more readily available.	100.72	1.3e-22	.48
3) I would buy more organic fruits and vegetables if they were cheaper.	71.98	2.3e-16	.21
How do organically grown fruits and vegetables compare to conventionally grown fruits and vegetables in supermarkets and other retail facilities?			
4) Quality ²	100.36	1.6e-22	.20
5) Variety ³	60.97	5.7e-14	.39
6) Price	46.65	7.4e-11	.21
Knowledge General ⁴	23.58	7.6e-6	
Knowledge Organic ⁵	6.75	.034	
Gender	6.53	.04	
Education	1.47	.48	
Purchase Organic	63.30	1.8e-14	
Household Income	1.47	.48	
Age	9.73	.01	

¹ Scale: 1 (strongly disagree) to 5 (strongly agree)

² Scale: 1 (better) to 3 (worse)

³ Scale: 1 (higher) to 3 (lower)

⁴ Scale: 3 (low) to 21 (high)

⁵ Scale: 3 (low) to 15 (high)

Cluster One, the largest segment at almost half (49%), believes there is no difference between the safety of conventional and organic fruits and vegetables (63%) and would overwhelmingly buy more if they were readily available (87%) and cheaper (98%) because the quality is better than conventional fruits and vegetables (65%)(Table 5). Prices are seen as higher for organic fruits and vegetables (99%), and variety is lower (71%) than conventional products. This segment has the highest proportion of females, about two-thirds female (64%), and has

purchased organic produce before (82%). More than half (56%) are 41 years of age or older. It has the second highest level of knowledge for fruit and vegetable safety and quality (8.57) and the second highest about organic fruits and vegetables (15.76).

Cluster Two, constituting 43 percent of respondents, is neutral on whether safety differences exist between conventional and organic fruits and vegetables (40%), but almost half are neutral on whether they would buy more if they were readily available (45%), although two-thirds would buy more if they were cheaper (67%). They believe quality between conventional and organic is similar (66%), with only a quarter viewing organic as better (24%). Variety is viewed as similar between the two (51%), but an equal amount view it as lower (48%). Organic is seen as higher priced (86%). This cluster is evenly split between men (49%) and women. Over 63 percent are 41 years of age or older. Less than half have purchased organic fruits and vegetables (43%), and they have the lowest knowledge about fruits and vegetables on both scales (13.91 for general and 7.30 for organic).

Cluster Three is the smallest segment at 8 percent. They view organic and conventional as similar on safety (69%) and overwhelmingly would eat more organic if readily available (87%) and cheaper (89%), because organic has higher quality (82%), which is almost universal with this segment. A quarter of the respondents view organic as lower priced (24%) than conventional with only half viewing it as more expensive (51%). Variety for organic is viewed as greater than for conventional (76%). This is our ideal segment because of its desire to consume more organic produce, and price is perceived comparable to or lower than conventional fruits and vegetables (49%). They are mostly female (62%) and most have tried organic before (84%). Almost half (45%) are under 35. It has the highest level of knowledge for fruit and vegetable safety and quality (9.30) and about organic fruits and vegetables (16.03).

TABLE 5: CLUSTER SOLUTION (means and percentages)

<i>Questions/Covariate Cluster (size)</i>	<i>One (49%)</i>	<i>Two (43%)</i>	<i>Three (8%)</i>
1) There is basically no difference between the safety of conventional and organic fruits and vegetables. ¹	3.76	3.04	3.87
Strongly disagree	.01	.07	.01
Somewhat disagree	.06	.20	.05
Neutral	.29	.40	.26
Somewhat agree	.43	.27	.45
Strongly agree	.20	.06	.24
2) I would buy more organic fruits and vegetables if they were more readily available. ¹	4.25	2.71	4.25
Strongly disagree	.00	.11	.00

Somewhat disagree	.01	.27	.01
Neutral	.13	.45	.13
Somewhat agree	.47	.17	.47
Strongly agree	.40	.01	.40
3) I would buy more organic fruits and vegetables if they were cheaper. ¹	4.81	3.85	4.48
Strongly disagree	.00	.07	.01
Somewhat disagree	.00	.07	.02
Neutral	.02	.20	.09
Somewhat agree	.14	.28	.25
Strongly agree	.84	.39	.64
How do organically grown fruits and vegetables compare to conventionally grown fruits and vegetables in supermarkets and other retail facilities?			
4) Quality ²	1.36	1.86	1.18
Better	.65	.24	.82
Same	.34	.66	.18
Worse	.01	.10	.00
5) Variety ³	2.71	2.47	1.24
Higher	.00	.01	.76
Same	.29	.51	.24
Lower	.71	.48	.00
6) Price	3.00	2.83	2.27
Higher	.99	.86	.51
Same	.01	.11	.25
Lower	.00	.03	.24
Knowledge General ⁴	15.76	13.91	16.03
Knowledge Organic ⁵	8.57	7.30	9.30
Gender (female)	.64	.51	.62
Purchase Organic (yes)	.82	.43	.84
Age			
19 to 35	.32	.27	.45
36 to 40	.12	.11	.17
41 to 50	.25	.29	.20
51 and older	.31	.34	.17

¹ Scale: 1 (strongly disagree) to 5 (strongly agree)

² Scale: 1 (better) to 3 (worse)

³ Scale: 1 (higher) to 3 (lower)

⁴ Scale: 3 (low) to 21 (high)

⁵ Scale: 3 (low) to 15 (high)

Discussion

Our research contradicts prior research where consumers are willing to pay a price premium for healthier foods (Aschemann-Witzel and Zielke 2017; Batte et al. 2007; Gao and Schroder 2009; Gao, Wong, House, and Spreen 2014) partly because there is no perceived difference between the safety of conventional and organic fruits and vegetables, although the quality of organic is perceived superior. Organic would be purchased more if cheaper and more readily available. Variety is perceived as better for conventional over organic. It does support prior research indicating that if comparably priced organics would be purchased more (Lodorfos and Dennis 2008) and that price is a barrier to purchase (Akaichi, Nayga and Gil 2012; Radman 2005; Govindasamy and Italia 1999; Jones 2000; Mayfield et al. 2001). Our respondents have purchased organic fruits and vegetables which supports prior research for consumers purchasing fresh and virtuous products (Van Doorn and Verhoef 2015).

Organic foods are clearly not for everybody. Therefore, to be profitable the most efficient means of marketing a product to its potential must be utilized. While it may not be a “regular” purchase for many consumers, the opportunity exists to make some sales especially to the segments that value organic foods. However, this study demonstrates that for a reasonably large segment of the population organic is or could be a regular choice. Two segments, comprising 57 percent of respondents are potential consumers of organic fruits and vegetables. While there may be a niche for the hard-core organic buyer who associates the purchase of organic with a lifestyle, there is a group of people that prefer organic for a variety of reasons, but may find it too expensive to purchase regularly. This contradicts prior research that consumers would pay a premium for healthier and safer

For example, those who purchased USDA organic fruits and vegetables have a higher propensity to buy organic fruits and vegetables if cheaper and readily available. They perceive organic as better quality. Knowledge about fruit and vegetable quality and safety and organic fruits and vegetables moderates this relationship. The higher the knowledge, the greater is the propensity to purchase. Younger buyers are the most favorably predisposed to purchase confirming prior research (Onyango, Hallman, and Bellows 2007; Rimal, Moon, and Balasubramanian 2006). To a lesser extent, females are more likely to purchase, which confirms prior research (Aguirre 2007; Mathisson and Schollin 1994; Onyango, Hallman, and Bellows 2007; Wandel and Bugge 1997).

From a managerial perspective, the key factor is focusing the marketing attention on the consumer segments that have the highest likelihood of purchase. Product availability and promotional materials may be wasted or at least an ineffective targeting of consumers who do not appear to have any interest in organic. This research helps to focus marketing efforts on potential organic buyers. Income was an important distinguishing variable, purveyors of organic fruits and vegetables must justify the higher prices, and/or have promotional materials that

reinforce the beliefs of organic quality and food safety. A sampling of organics may be an effective tactic in overcoming price resistance. This may partially occur by having consumers try the product. The difficulty is that distribution is perceived as limited. Since distribution is limited due to the availability of product, at least in the near future, efforts should be made to find the food retailers that emphasize and are associated with highest product standards and environmentalists. While the obvious choices are chains such as Whole Foods, Sunflower, and Wegman's, it is just as important to avoid chains that are truly targeting the low-income families. However, keep in mind that the benefits perceived by consumers of organic fruits and vegetables tend to be intrinsic use rather than extrinsic cues. One should not underestimate the value of point-of-sale information to the consumer is explaining both food safety and product quality.

Finding the most effective price level is also critical to the sales of organic foods. If retailers sell its organic food at too high a price, their market is often restricted to the hard-core organic shopper, too small a segment, and the supermarket loses potential margin. Finding a balance between price and potential market size is critical.

Limitations and Future Research

The scales measuring knowledge were based entirely on self-reporting. We could not objectively verify respondents' actual nutritional knowledge. Underlying motivations for purchasing organic fruits and vegetables were not gathered. We only examined one group of organic products. Additionally, a wider choice of organic foods including organic processed foods such as soups and cereal should be considered for future research. Finally, given the price sensitivity of many respondents, a tradeoff analysis, such as conjoint, could be estimated to examine at what price customers are willing to purchase organic fruits and vegetables. Consumer perceptions also differ by country and benefit claimed (van Trijp 2007). Product costs knowledge could be correlated with objective knowledge to understand whether consumers are accurate in their self-assessment.

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