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**Direct Marketing of Fresh Produce:
Understanding Consumer Interest in Product and Process-Based Attributes**

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Selected Paper prepared for presentation at the American Agricultural Economics

Association Annual Meeting, Long Beach, California, July 23-26, 2006

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Direct marketing to consumers by small and medium-sized producers is on the rise and becoming an important source of revenue for farms with more limited economies of scale. Evidence of direct marketing's growing significance is documented in the 2002 USDA Ag Census which found that the number of farmers using direct marketing strategies had increased from 110,639 to 116,733 between 1997 and 2002. The average value of direct sales per farm rose from \$5349 to \$6958 while nationwide, total receipts from marketing direct to consumers by producers increased by 37% to over 8 million dollars during the same time period.

Concurrent with increases in the number of farmers who participate in direct sales to consumers, the number of direct marketing channels has also grown. The USDA's Agricultural Marketing Service notes that while sales via farmer's markets is less than 2 percent of U.S. produce sales, the number of farmer's markets nationwide has grown by 79% to 3,100 between 1994 and 2002 (Handy et al. 2000). In addition, Community Supported Agriculture programs (CSA's), through which a consumer or group of consumers purchase(s) a share of a farmer's production prior to the beginning of the growing season, are experiencing dramatic growth. The first known U.S. CSA was organized in Massachusetts in 1985, and by 2001 there were more than 1,000 domestic CSA's in operation. Other direct marketing channels include roadside stands, pick-your-own operations, internet-sales, consumer delivery, and on-farm stores.

The appeal of utilizing the above marketing channels to employ direct marketing strategies is easily understood from the producer perspective. Through direct marketing, producers are able to sell straight to the consumer and avoid expenses associated with

using a broker or wholesaler. CSA's are also able to spread production risk over a number of shareholders. However, little is known about what type of produce attributes motivates consumers to patronize certain direct marketing channels and what characteristics differentiate these patrons relative to other consumers so that their needs can be effectively met by producers.

In order to better understand consumer purchasing decisions and willingness to pay for alternative attributes of fresh produce, this paper employs factor and cluster analysis techniques to explore a national-level dataset of fresh produce consumers. Specifically, we characterize the major sources of variation in the dataset using four internally-derived factors, and then use these factors to split the data into five consumer segments using cluster analysis. We then examine the major differences in preferences and willingness to pay across these groups with respect to various produce attributes, production processes, and production locality. Knowledge acquired from these analyses is expected to assist small farms in more effectively targeting receptive consumer segments through the use of promotional materials, choice of produce offerings, and participation in direct marketing channels. This paper proceeds with a brief discussion of the literature, data and methods, and research findings. The conclusion section summarizes the primary results and offers suggestions for direction of future research.

Background

Smith's (1956) influential work on market segmentation is now a common method for strategically developing the marketing mix for a variety of products. Nearly every market has some distinctive segments, and almost all markets are segmented by price and

quality issues. Generally, however, price and quality do not provide the most clear or definitive market segmentation. Much stronger segmentation can usually be found through an evaluation of product or service uses and importance of production attributes to various consumers.

For example, food safety, specifically as it relates to production practices, may be one dimension along which the market is segmented. In a study measuring food safety preferences related to produce, Baker and Crosbie (1993) found three segments, one concerned with pesticide use, one concerned with the level of damage to produce (the majority of respondents) and one primarily concerned with price and quality. Baker and Burnham (2001) conducted a similar study considering genetically modified foods, and again, found three segments. The three clusters, Brand Buyers, Safety Seekers and Price Pickers, were motivated by different concerns, attitudes toward risk and knowledge of genetically modified organisms, but had demographics that were very similar to each other, illustrating that demographics are not always effective market segmentation factors.

Another dimension is the support for local agriculture (Stephenson and Lev 1998). Previous research has shown that consumers who prefer locally produced agricultural goods value freshness, high quality, fair pricing, social interaction, and locally-grown attributes in the produce they purchase at farmer's markets (Lockeretz 1987; Brown 2002). A set of studies conducted by Thilmany, Grannis, and Sparling (2003) and Grannis and Thilmany (2002) examining the potential market for natural pork and natural freezer beef in the Intermountain West, supports this general finding. Furthermore, Empacher, Gotz, and Shultz (2002) found four clusters of consumers in a study of

German sustainable consumption behaviors: 1) Well-organized eco-families who support local and sustainable agricultural practices (civic agriculture), 2) Strugglers, consumers who are low-income and price sensitive, 3) Rural traditionalists, consumers with traditional agrarian values who have historical ties to agriculture, and 4) Professionals, consumers without children and singles in urban areas with a focus on quality and image. With regard to 1), Sunding (2003) asserts that, in addition to consumers' traditional concerns about nutritional content, purity, and freshness, consumers also may value a product more because it addresses a social concern or has a public good aspect, even though the product may not necessarily be "more valuable" or "higher quality" than a conventional product.

This study updates and consolidates this previous work, with a focus on specific value-added fresh produce products, and further explores the differentiation of consumer segments that are the most likely consumers of direct marketed fresh produce. We explore the traditional concerns, but also account for civic agricultural issues such as local production and production systems which tend to be associated with higher levels of environmental quality (e.g., organic production), as well as the impact on consumer preferences from information about nutrition and the source of purchase of fresh produce.

Data and Methods

This study is part of a larger interdisciplinary project that integrates research and outreach on production, food nutritional analyses, marketing and nutrition education on fresh produce cultivars with a focus on enhanced nutritional properties through cultivar selection and organic production. The project began in 2005 with an inquiry into the

antioxidant properties of 10 cultivars for each of six products commonly sold through direct marketing channels: broccoli, garlic, lettuce, melons, spinach, and tomatoes. Results from the first round of field trials indicate that several melon cultivars exhibit higher total phenolic content and vitamin C levels when grown organically. This information was used to frame potential marketing claims to consumer respondents in our survey.

Consumer data concerning purchasing habits, attribute preferences and willingness to pay was collected from a national online survey conducted by the National Family Opinion organization in May 2006. The National Family Opinion organization was directed to obtain a stratified sample, ($n \geq 1200$), representative of the United States Census and second stratified sample, ($n \geq 330$), representative of consumers that selected farmer's markets and direct-from-producers channels as either primary, secondary, or seasonal sources of fresh produce. A total of 3170 members of the National Family Opinion organization's online survey database were solicited to take the survey and a total of 1549 responses were returned, providing a 48.86% response rate. The summary statistics of the socio-demographic information and other responses are located in Table 1.

The sample is comparable to the United States population based on the U.S. Census in terms of income, household size, and the percent of households with children living at home. The fact that this sample is predominantly female is consistent with the results of several previous food-based surveys because females are generally the primary grocery shopper in a household.

Additional information concerning the geographic distribution of respondents is provided in Table 2. Each major geographic area of the United States is represented by the sample, suggesting that we are unlikely to experience bias due to overrepresentation of consumers from any one geographic area or market size. This feature of the data is useful considering that Kremen, Green, and Hanson (2004) found consumer interest in organically grown produce to be relatively low or even negative in several rural areas of the United States since consumers in these areas were also found to have relatively low awareness of organic food.

In general, the survey elicited information on consumer shopping behavior, ratings for different fresh produce production attributes (organic, pesticide free, traceable from farmer to consumer, locality of farmer, and country of origin), and attitudes about the product itself including carbohydrate levels, vitamin content, color of produce, and visual appeal among other attributes. In addition, a contingent valuation method utilizing payment cards was used to elicit consumers' reasonable and maximum willingness to pay for melons and specialty potatoes with differing production and product characteristics. Both melons and potatoes are common direct marketing offerings in Colorado and the US and examples of products for which new nutritionally superior cultivars are available.

Results

In order to get a sense of what motivates consumers when deciding where to shop for fresh produce, respondents were asked to rank a set of factors that enters their decision on a scale from "Not Important"=1 to "Extremely Important"=5. Means and standard deviations of each location-related variable are reported in table 3. When compared to

the findings of Kremen, Greene, and Hanson (2004), our study finds that support of local agriculture and social interaction are relatively less important compared to features such as superior quality, safety, and competitive prices of products when the entire sample is analyzed.

Consumer data was also summarized to determine what production process and product attribute variables were most important (table 4). Of equal but primary importance to consumers in our study was feeling that the produce was a good value for the money and that the produce had an appealing texture and level of firmness. Attributes such as the color, visual appeal, and freshness of the produce were ranked as being similar in importance to the purchasing decisions. Identifying the product as having been grown without the use of pesticides ranked as the most important production process related attribute followed by the product being labeled with the country of origin and the product being locally grown. Produce that is grown using USDA certified organic cultivation methods is the lowest ranked process-based attribute. This is a somewhat surprising result in light of recent efforts by supermarkets and chains to capitalize on increased demand for organic products by offering mass market (Gray 2006), but similar to past research by Thilmany et al that showed specific claims, like antibiotic free (akin to pesticide free in this survey) were more compelling to consumers than more complex certifications.

Factor Analysis

Given the great variety and number of variables we collected to analyze consumer purchasing behavior, it is appealing to consider using factor analysis to summarize the

data and to assist with detecting correlated relationships between variables. Most importantly, this analysis method helps to determine important characteristics that differentiate consumers in meaningful ways and to delineate factors that jointly influence consumer behavior. Factor analysis involves using the eigenvalues and eigenvectors of the correlation matrix of the data collected to summarize the major sources of variation and covariation between variables in a dataset. Each factor (associated with an eigenvalue) can be described as a linear weighted combination (defined by the eigenvector) of included variables. This factor weight can be interpreted as the correlation between the individual variable and the compound factor itself.

The results from the factor analysis of US consumers are presented in tables 5 and 6. The factors can be described in two ways: by the types of variables that have high loadings, and thus, play an important role in explaining consumer differences (as in table 5), and by the absolute amount of consumer variability explained by any one compound factor (as in table 6). The first factor is dominated by intrinsic properties of the produce, such as vitamin content, produce color, firmness and texture, visual appeal, and taste, and to a lesser extent with production practices and location. Convenience and value are not highly correlated with this factor, and it is only factor with positive loadings on several of the product attribute ratings. This factor is only slightly influenced by shopping venue, spending on food and produce, less fresh and more processed/frozen forms of produce (possibly linked to convenience), and spending on and recent changes in produce purchases. There are few negative loadings on this factor, with the exception of

perceived value of food and produce purchases. As a whole, this factor explains 40% of the variability among the survey sample.

The second most important factor explains almost 24% of the variability of the sample, and appears to be most closely related to information about food's nutritional function and the credibility of the various sources of information about nutrition. In addition, several shopping outlets were important to this factor, including secondary and seasonal purchases from farmers markets, direct from producers, specialty and health stores, indicating some perceived differentiation in the offerings among shopping venues. As such, we call this the extrinsic information factor. There were negative loadings relative to the importance of product attributes, especially those related to intrinsic characteristics like texture, color and visual appeal.

The third most important factor explains approximately 21% of the variability, and is closely aligned with the source, production practices and locality of produce purchases, all of which are potential motivations for civic agriculture aimed at meeting public goals with food purchases (Lyson 2004). This factor includes the highest loadings on organic, pesticide free, traceability, local purchases as well as more spending, increased purchases and changes to produce from new marketing channels and which are produced with alternative production practices. Additionally, the negative factor loading for several sources and credibility of food and nutrition information might suggest a perceived distrust with government and business institutions. One could suggest that this factor is a driving force in the need for this research given these issues are emerging as

important differentiation criteria among consumers in the market, and likely have driven the growth in alternative markets including farmers markets, CSAs and Whole Foods.

Finally, factor 4 explains 16% of the sample variance, and appears related to more price and quality attributes as a whole; in other words, perceived value. There is also more influence from academic and medical professionals as an information source in this factor, but otherwise negative loadings with the exception of the Internet as a source of information. Finally, there is higher correlation on the value gotten for food dollars, possibly due to a positive relationship with canned produce purchases which tend to be the most economical source of produce.

These factors represent little that is informative on their own, but demonstrate how a large number of variables relate to one another, and justify the inclusion of these factors in subsequent analyses. Some variables (product attributes) could be considered as a related set; for example, “organic,” “local,” and “country of origin” have similar loadings for factor 3. However, others variables have unique interpretations depending on the context they are considered within (“organic,” and “local” have counter effects on factor 4), suggesting consumers with mixed feelings. This factor analysis motivates the types of variables included in the subsequent analysis of consumer clusters.

Cluster Analysis

Cluster analysis will also be used to analyze differences in purchasing behavior across sub-groups of respondents. Sub-groups are created such that individuals within an individual subgroup share similar attitudes about certain variables relative to other sub-groups. These subgroups are similar to market segments which are identified to assist

businesses in tailoring their marketing efforts and product offerings. For this analysis, we used a k-means clustering technique embedded in STATA 7.0.

After creating clusters, summary statistics are calculated for some of the relevant variables (as determined by the factor analysis) and differences among these means are used to “name” each cluster by its prominent differences relative to other clusters. There were five clusters created, with numbers ranging from 9 to 44% of the market (Table 6).

Cluster 1 (142 consumers or 9% of the sample) was labeled the Nonmetro Traditionals given the prominence of relatively lower income and educated consumers from the Midwest and South’s smaller market areas, and relatively low ratings for extrinsic variables. Although they reported a relatively low willingness to pay for either the differentiated melon or potatoes, what they would pay could be attributed to support for the local farmers and economy.

Cluster 2 (294 consumers or 19% of the sample) was labeled Local Food Advocates given that the only relatively high product attribute rating they gave was for locally produced offerings even as they reported consuming less produce over the past year as they switched to different types of preparation (canned and precut). These consumers are from mid-size markets, are older and have relatively lower incomes.

Cluster 3 (684 or 44% of the sample) was labeled Young, Engaged and Educated given they were the youngest, most educated consumers (although not necessarily higher income). They have the highest ratings on importance of both process-oriented (organic, pesticide free, product source) and health related product attributes and have a higher willingness to pay for differentiated melon and potato products. They are more likely to

shop at health food stores and support organic production as a means of supporting perceived benefits to the environment.

Cluster 4 (238 or 15% of the sample) was labeled the Health Driven and Educated given that the only high product ratings were for vitamin content of produce, and most of the premiums they were willing to pay were associated with perceived nutritional benefits, a fact that may explain their relatively higher increase in produce consumption over the past year. This segment was higher income, more educated and tended to be older parents.

Cluster 5 (191 or 12% of the sample) was labeled the Urban Value Seekers since they were lower middle income consumers from the biggest market areas in the Midatlantic and Pacific states. These consumers rated almost all product attributes lower than other segments, and this lack of concern translated to lower willingness to pay for differentiated melons and potatoes. They did attribute the premiums they were willing to pay to nutritional benefits and perceived quality and safety, indicating a concern about personal benefits from produce rather than how it might support local economies, environment or other causes.

Marketing Implications and Conclusions

The growth in organic produce sales in the United States has been strong and stable for most of the past 10 years. As organic produce is considered and adopted by more households, the set of other attributes that can be jointly marketed must be considered, including local foods and those with enhanced nutritional properties. This research presents a segmentation of US consumers' produce shopping and consumption

behavior, perceptions about product attributes and willingness to pay for differentiated products using factor and cluster analysis. In past focus groups with producers, there was speculation about the relative importance of organic certification relative to simple claims of pesticide free practices or local production, but no formal study had been undertaken. Moreover, there was some curiosity about whether organic produce could also make associated health claims, and if so, whether these additional claims would increase the perceived value to consumers. Organic and alternative production systems are important differentiation factors, but as the cluster analysis indicates, customers are also motivated by a number of different factors.

Young, Engaged and Educated consumers (44%) and Health Driven and Educated (15%) consumers both indicate a willingness to pay a relatively higher premium for produce differentiated by organic production, nutritional claims or produced locally. The young and educated consumers' willingness to pay a premium appears to be motivated by their concerns about extrinsic product attributes and underlying support for more public oriented concerns such as the environment. On the other hand, Health Driven consumers' willingness to pay premiums may be more personal in nature; as this segment of consumers ranked nutrition attributes significantly higher than the sample average and attributed more of the premium they would pay to the fact they felt the nutritional quality of differentiated produce was higher.

As a contrast to Clusters 3 and 4, Nonmetro Traditionals and Local Food Advocates are not willing to pay a premium price for differentiated produce, but may be willing to buy more from farmers markets or direct from producers as they believe in

supporting local agriculture. Producers might target these consumers for produce that would not otherwise sell as quickly, such as produce that is in oversupply in high season or seconds (for canning).

Overall, these results indicate the potential strength of production methods and nutritional claims (and marketing of such quality differences) as product differentiation criteria. Although there is less variability across marketing channels than one might expect, it may be a testament to the “mainstream” adoption of more produce differentiated by organic or other claims.

This article illustrates the type of market research that may be useful for small and midsize producers seeking value-added marketing opportunities, as well as painting a bigger picture about the types of consumers who are fueling the growth in differentiated produce markets in the US. On a broader scale, further analysis of these consumer segments could also help different meat market participants (supermarkets, health and specialty stores, and producers who directly market their produce) differentiate themselves by the type of consumer segment they hope to attract with their product offerings and their own market image. This information can inform emerging producer initiatives, helping them to differentiate their products through adoption of new production and varietal alternatives that are in demand by consumers, as well as the labeling and promotion of such attributes.

Acknowledgements

This study was funded by the USDA NRI Small and Midsize Farms NRI program administered by the CSREES, with matching support from the Colorado Ag Experiment Station and CSU Specialty Crops Program funded by the Colorado Department of Agriculture.

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Table 1. Summary Statistics for the Demographic Variables (n = 1549)

Variable			
Name	Description (Coding)	Mean	Standard Deviation
Age	In years	51.07	14.70
Gender	1 if female, 0 if male	0.74	0.44
Weekly Grocery Expenditures	1 = < \$50, 2 = \$50 - \$99 3 = \$100 - \$149 4 = \$150 - \$199 5 = \$200 - \$299 6 = \$300 or more	2.36	1.01
Market Size (persons)	1 = Under 100,000 2 = 100,000 - 499,999 3 = 500,000 - 1,999,999 4 = 2,000,000 and over	3.03	1.08
Household Income	1 = < Under \$30,000 2 = \$30,000 - \$49,999 3 = \$50,000 - \$74,999 4 = \$75,000 and Over	2.49	1.17
Race	1 if Caucasian, 0 if otherwise	0.90	0.30
Spanish Origin	1 if Spanish Origin, 0 if otherwise	0.03	0.16
Household Size	Actual number in household, range: 1 to 7 members	2.41	1.34
Life Stage	1 if single, no children, 0 otherwise	0.26	0.44
	1 if couple, no children, 0 otherwise	0.40	0.49
	1 if couple, at least one child in household	0.32	0.47

Table 2. Geographic Distribution of Sample (n = 1549)

Region	Count	Percentage
New England	78	5.0%
Middle Atlantic	244	15.8%
East North Central	251	16.2%
West North Central	120	7.7%
South Atlantic	263	17.0%
East South Central	82	5.3%
West South Central	169	10.9%
Mountain	114	7.4%
Pacific	228	14.7%

Table 3. Average Ratings for Choice of Location for Fresh Produce Purchases (n = 1549)

Variable	Mean	Standard Deviation
Superior products (taste and flavor)	4.105	0.905
Safety of the Product	4.035	0.988
Competitive Prices ^a	3.773	0.999
Variety available	3.764	0.907
Convenient purchase location	3.591	1.020
Support local producers and businesses	3.148	1.179
Physical/Aesthetic appeal of location	2.821	1.132
Recommendation of a family member or friend	2.461	1.090
Social Interaction	1.759	1.031
Note: Coded 1=Not important, 2=Somewhat important, 3=Important, 4=Very important, 5=Extremely Important. All means significantly different at 5% unless otherwise noted.		
^a Not significantly different at the 5% level.		

Table 4. Average Production Process and Product Attribute Ratings for Produce Purchases (n = 1549)		
Variable	Mean	Standard Deviation
Good value for the price ^a	3.941	0.900
Firmness and texture ^a	3.927	0.897
Color of produce ^b	3.656	0.939
Visual appeal ^b	3.637	0.951
Fresh (not frozen)	3.556	1.084
Vitamin content	3.314	1.056
Pesticide free (producer claim) ^c	3.253	1.209
Variety/cultivar you prefer ^{c,d}	3.213	1.074
Other nutritional properties (antioxidants) ^d	3.169	1.092
Perceived taste (sampling, prior purchases)	3.097	1.192
Labeled with country of origin ^e	2.885	1.247
Locally grown ^e	2.862	1.150
Convenient preparation, precut/washed	2.622	1.091
Carbohydrate levels ^f	2.500	1.191
Type of package (clamshell, bagged salad) ^f	2.491	1.104
Traceable from farm to consumer ^f	2.447	1.181
Organic (USDA Certified Organic)	2.329	1.185
Brand name	2.240	1.040
Relationship with producer	1.941	1.020
Note: Coded 1=Not important, 2=Somewhat important, 3=Important, 4=Very important, 5=Extremely Important. All means significantly different at 5% unless otherwise noted.		
^{a,b,c,d,e,f} Not significantly different at the 5% level.		

Table 5. Factor Analysis and Loadings

Variable	Factor 1:	Factor 2:	Factor 3:	Factor 4:
	Intrinsic Characteristics	Extrinsic Information	Preferences for Sustainable/Local Ag	Price/Quality and Value
Gender	0.022	-0.0208	-0.1287	-0.005
Age	-0.1851	-0.19	-0.0604	-0.2701
Source of General Groceries (1 if Secondary/Seasonal Source)				
<i>Secondary (Mutually Exclusive)</i>				
Supermarket	0.0622	-0.0558	0.0169	-0.1584
Health/Natural foods store	0.1612	-0.06	0.0806	0.2269
Supercenter	-0.0373	0.0387	0.0203	-0.0348
Farmer's market	-0.0398	-0.0385	-0.0573	-0.1026
Direct from producer (incl. farm/ranch, internet, mail)	0.1196	0.2286	-0.0658	-0.1927
Specialty food store (gourmet, ethnic delicatessen, etc.)	-0.0712	0.057	0.0529	0.343
<i>Seasonal (Not Mutually Exclusive)</i>				
Supermarket	0.0694	-0.0113	0.2637	0.2237
Health/Natural foods store	-0.002	0.1407	0.1097	0.1227
Supercenter	0.0027	0.0839	0.0334	0.0145
Farmer's market	0.1146	0.244	0.2989	0.0323
Direct from producer (incl. farm/ranch, internet, mail)	-0.0013	0.0439	0.2931	-0.0821
Specialty food store (gourmet, ethnic delicatessen, etc.)	0.069	0.1994	0.053	0.0404
Source of Fresh Produce (1 if Secondary/Seasonal Source)				
<i>Secondary (Mutually Exclusive)</i>				
Supermarket	0.2229	0.0494	-0.1165	0.011
Health/Natural foods store	-0.062	0.0574	0.2067	0.326
Supercenter	0.0075	-0.0561	0.0004	-0.148
Farmer's market	-0.1615	-0.1145	0.1235	-0.1172
Direct from producer (incl. farm/ranch, internet, mail)	0.1474	0.0064	0.0363	0.0371
Specialty food store (gourmet, ethnic delicatessen, etc.)	-0.0952	-0.0695	-0.2366	0.1276
<i>Seasonal (Not Mutually Exclusive)</i>				
Supermarket	0.0847	0.0856	0.2859	0.1008
Health/Natural foods store	-0.0024	0.1656	0.2074	0.1224
Supercenter	-0.1101	0.1502	0.0741	-0.0115
Farmer's market	0.0226	0.0856	0.0501	0.0133
Direct from producer (incl. farm/ranch, internet, mail)	-0.1279	-0.1174	0.2804	-0.1968
Specialty food store (gourmet, ethnic delicatessen, etc.)	-0.1256	0.1614	0.3327	0.2414
Type of Produce (1=sometimes purchased, 2=never purchased)				
Fresh, unprocessed	-0.0456	0.2405	0.0194	-0.1464
Canned or preserved	0.0861	-0.0757	0.133	0.3604
Frozen	0.1497	-0.1344	0.0627	-0.0186
Precut/prewashed/ready-to-eat	0.1641	-0.0927	0.1013	0
Spending/Value per Dollar				
Spending on groceries (1 of 6 expenditure categories)	0.1748	-0.0082	-0.0911	-0.0527
Value per food dollar (Poor value, fair value, good value)	-0.1771	0.05	-0.0518	0.4112
Spending on fresh produce (Nearest dollar)	0.167	0.097	0.1585	0.0257
Value per produce dollar (Poor value, fair value, good value)	-0.0848	-0.1266	0.0469	0.168

Table 5. Factor Analysis and Loadings (cont'd)

Variable	Factor 1: Intrinsic Characteristics	Factor 2: Extrinsic Information	Factor 3: Preferences for Sustainable /Local Ag	Factor 4: Price/Quality and Value
Purchasing Habits (Frequency is daily, weekly, monthly, less frequently, or not at all)				
Frequency of fresh produce purchases, general	0.0403	0.0189	-0.0437	0.0483
Frequency of fresh produce purchases, direct from producers	-0.2048	-0.0778	-0.1193	0.3394
Purchased more produce (=1 if yes compared to last yr)	0.2124	0.232	0.1825	0.2017
Purchased less produce (=1 if yes compared to last yr)	-0.0174	0.1303	-0.0424	-0.3315
<i>Types of Fresh Produce Changes (If change in type)</i>				
Kinds of produce (e.g. citrus to berries)	0.0625	0.0531	0.0161	0.0407
Production practice (e.g. organic)	0.2038	0.1506	0.5149	0.3838
Type of market (farmer's market, CSA)	0.038	0.0328	0.2475	-0.0372
Type of preparation (e.g., pre-cut)	-0.1406	0.1996	-0.0851	-0.1348
Product attributes (color, variety)	0.0722	-0.1076	0.0868	-0.1278
Production Practices and Attributes (Not at all important, somewhat imp., imp., very imp., extremely imp.)				
Organic (USDA Certified Organic)	0.4023	-0.0477	0.5009	0.3171
Pesticide free (producer claim)	0.4357	-0.2355	0.3518	0.0944
Vitamin content	0.6511	-0.1715	-0.0593	0.2035
Other nutritional properties (antioxidants)	0.4843	-0.1753	0.1649	0.1291
Firmness and texture	0.5149	-0.4546	-0.1341	-0.019
Color of produce	0.5592	-0.5952	-0.1862	-0.1413
Visual appeal	0.4985	-0.5538	-0.1744	-0.1973
Perceived taste (sampling, prior purchases)	0.4937	-0.0102	0.1337	0.0002
Carbohydrate levels	0.4966	0.1041	-0.0296	-0.2521
Variety/cultivar you prefer	0.4391	-0.2447	-0.041	0.0846
Brand name	0.3399	-0.0579	-0.0167	-0.2114
Fresh (not frozen)	0.3356	-0.3945	-0.0222	-0.0263
Traceable from farm to consumer	0.5565	-0.1699	0.4552	-0.0544
Labeled with country of origin	0.4179	-0.2811	0.2953	-0.0464
Locally grown	0.3647	-0.229	0.5243	-0.0317
Convenient preparation, precut/washed	0.13	0.1167	-0.3789	-0.1964
Type of package (clamshell, bagged salad)	0.3386	0.0903	0.0325	-0.2383
Good value for the price	0.1928	-0.3843	-0.0971	-0.042
Relationship with producer	0.4689	0.0304	0.3827	-0.2414
Educational Methods (Not at all desirable, somewhat desirable, desirable, very desirable, extremely desirable)				
Newspapers	0.1674	0.2232	-0.2987	-0.2036
Magazines/Periodicals	0.2309	0.4226	-0.2787	-0.2025
Radio (Talk, NPR)	0.3412	0.3776	0.0287	-0.1529
Television	0.3833	0.3383	-0.2647	-0.2502
Electronic newsletters/email updates	0.4164	0.4592	0.0356	-0.1183
Internet/World Wide Web	0.3478	0.3774	-0.0959	0.1636
Videos, CD-Roms and DVDs	0.3103	0.384	0.2052	-0.2131
Fact sheets/publications in public places (library, Coop Ext., etc.)	0.4395	0.2596	0.2815	-0.1132
Presentations/seminars in your community	0.3455	0.4645	0.2844	-0.3219
Booths at Food Markets	0.4394	0.3733	0.1663	-0.2061
Internet/phone Hotline	0.3599	0.5609	0.1695	-0.0409

Table 5. Factor Analysis and Loadings (cont'd)

Variable	Factor 1: Intrinsic Characteristics	Factor 2: Extrinsic Information	Factor 3: Preference for Sustainable/ Local Ag	Factor 4: Price/Quality and Value
Credibility of Sources of Information (Not at all credible, somewhat credible, credible, very credible, extremely creditable)				
Cooperative Extension personnel	0.3098	0.3041	-0.1111	0.0558
Government agencies	0.2948	0.3967	-0.4076	-0.0534
Farmers/producers	0.4711	0.0446	0.016	-0.0104
Food industry associations	0.4558	0.0874	-0.289	0.0014
Medical professionals (MD, RN, LPN)	0.423	0.1805	-0.4423	0.309
Nutrition professionals	0.5614	0.1926	-0.3893	0.3922
Friends/family	0.4245	-0.2179	-0.1834	-0.0013
Academic researchers	0.519	0.1169	-0.3144	0.4258
Media/celebrities	0.2942	0.1796	-0.1621	-0.2489
Internet blogs/support networks	0.3899	0.3531	-0.1344	0.125

Table 6. Summary statistics by consumer segments

Variable	Cluster 1: Nonmetro Traditionals (n = 142) or 9%				Cluster 2: Local Food Advocates (n = 294) or 19%		Cluster 3: Young, Engaged and Educated (n = 684) or 44%		Cluster 4: Health Driven and Educated (n = 238) or 15%		Cluster 5: Urban Value Seekers (n = 191) or 12%		Full Sample (n = 1549)	
	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.
	Production Practices and Attributes (Not at all important, somewhat imp., imp., very imp., extremely imp.)													
Organic (USDA Certified Organic)	1.9859	1.0652	2.0476	1.0602	2.6754	1.2220	2.1008	1.1243	2.0628	1.0693	2.3292	1.1851		
Pesticide free (producer claim)	2.9155	1.1760	3.1122	1.2356	3.4810	1.1509	3.0672	1.2099	3.1361	1.2575	3.2531	1.2090		
Vitamin content	2.7958	1.0487	3.2483	1.0497	3.4591	1.0281	3.4118	1.0263	3.1623	1.0662	3.3144	1.0559		
Other nutritional properties (antioxidants)	2.6761	1.0283	3.0612	1.1190	3.3260	1.0509	3.2185	1.1036	3.0785	1.0998	3.1691	1.0919		
Firmness and texture	4.0070	0.7945	3.9762	0.8721	3.8699	0.9083	4.0000	0.9232	3.9058	0.9242	3.9271	0.8967		
Color of produce	3.7465	0.8787	3.7347	0.9335	3.6374	0.9482	3.6681	0.9250	3.5183	0.9671	3.6559	0.9392		
Visual appeal	3.6761	0.8551	3.6088	0.9949	3.6009	0.9466	3.7143	0.9821	3.6859	0.9267	3.6372	0.9510		
Perceived taste (sampling, prior purchases)	3.0704	1.2183	3.0102	1.1901	3.1462	1.1615	3.2899	1.1960	2.8325	1.2325	3.0968	1.1920		
Carbohydrate levels	2.2676	1.1785	2.3878	1.1739	2.6374	1.1657	2.4706	1.2783	2.3927	1.1552	2.5003	1.1908		
Variety/cultivar you prefer	3.2113	1.1034	3.2721	1.0519	3.2149	1.0805	3.1975	1.0428	3.1361	1.1061	3.2130	1.0740		
Brand name	2.0493	1.0405	2.2279	1.0736	2.3480	1.0487	2.1008	0.9842	2.1885	0.9873	2.2402	1.0401		
Fresh (not frozen)	3.6901	1.0598	3.5408	1.1611	3.5819	1.0648	3.4328	1.0442	3.5393	1.0941	3.5558	1.0844		
Traceable from farm to consumer	2.2394	1.1419	2.3639	1.1568	2.6915	1.1756	2.1807	1.1123	2.1885	1.1859	2.4474	1.1810		
Labeled with country of origin	2.7254	1.3054	2.9150	1.2239	3.0819	1.1999	2.6092	1.2233	2.5969	1.3058	2.8851	1.2466		
Locally grown	2.8873	1.1492	3.1497	1.1528	3.0278	1.1185	2.5882	1.0627	2.1466	1.0050	2.8618	1.1503		
Convenient preparation, precut/washed	2.4789	1.1155	2.5272	1.1378	2.6886	1.0800	2.6639	1.0656	2.5864	1.0571	2.6223	1.0909		
Type of package (clamshell, bagged salad)	2.2254	1.1070	2.4762	1.0762	2.5980	1.0960	2.4286	1.0952	2.4031	1.1470	2.4906	1.1041		
Good value for the price	4.0211	0.8870	3.9830	0.9105	3.9050	0.9062	3.9706	0.9159	3.9058	0.8532	3.9406	0.9002		
Relationship with producer	1.9014	1.0871	1.8605	0.9798	2.1287	1.0498	1.7437	0.9033	1.6649	0.9363	1.9406	1.0200		
Maximum Willingness to Pay (1 to 10, \$0.10 price increments)														
Organic, local melon with 25% higher Vitamin C	3.4592	2.4206	4.1948	2.5093	4.9847	2.5934	4.6269	2.3839	3.7987	2.2211	4.5233	2.5410		
Organic Purple potatoes with 50% higher Vitamin C	2.4571	1.6567	2.4539	1.5188	3.2565	1.9114	2.9194	1.6606	2.8381	1.8351	2.9619	1.8142		
Share of premium due to preferences for fresh produce differentiated by production practices attributable to:														
Relationship with perceived nutritional benefits	14.2535	15.0590	12.0170	10.2722	23.6301	10.8475	47.4832	19.0929	41.9424	27.2136	26.4894	19.8395		
Relationship with perceived food safety benefits	12.8803	13.0213	10.9592	10.1234	24.0468	10.6043	21.9538	14.1129	38.6335	23.9517	22.0161	15.8787		
Support organic agriculture’s production practices	10.7676	13.9679	9.7245	10.8343	24.8962	14.3791	11.3361	11.1747	6.7801	9.2925	16.4041	14.8176		
Support for local farmers	62.0986	24.8913	67.2993	17.9620	27.4269	11.4012	19.2269	12.4903	12.6440	14.1361	35.0904	24.7793		
Share of premium due to preferences for fresh produce direct from producers attributable to:														
Economic support for agriculture and the community	43.4789	29.7383	40.2993	24.6522	24.6594	10.1811	42.2815	20.8857	11.5026	10.8937	30.4384	20.9116		
Relationships with perceived produce quality and safety	17.0704	21.4180	15.5918	14.3592	25.2208	11.0611	19.1807	12.3697	66.3979	19.3382	26.7954	20.9799		
Relationship with land and environmental benefits from local farms	20.1268	23.4088	21.1293	18.8914	27.1214	11.8092	16.4286	11.6039	9.8063	10.7600	21.5649	15.7734		
Minimizing food miles/energy dependency	19.3239	24.7233	22.9796	21.2089	22.9985	12.0443	22.1092	20.0663	12.2932	14.0150	21.2014	17.4024		
Share of premium due to preferences for fresh produce differentiated by variety/color attributable to:														
Relationship with perceived nutritional benefits	7.9014	11.0411	29.3095	19.5390	25.9284	10.1897	42.8740	18.9267	35.3403	21.2713	28.6817	17.8614		
Create meals with different flavor/texture/appearance	68.6268	21.7346	17.7925	12.2469	24.5380	11.3487	17.4622	14.1819	21.8115	22.2873	25.8761	20.3415		
Uniqueness of new or different food products	16.8873	18.2823	15.4048	16.0323	21.0848	12.2438	9.8950	8.9467	11.1728	13.1372	16.6804	14.0848		
Relationship with perceived health benefits	6.5845	8.1947	37.4932	20.9974	28.4488	12.2240	29.7689	16.1575	31.6754	20.2635	28.7618	17.5130		

Table 6. Summary statistics by consumer segments (continued)

Variable	Cluster 1: Nonmetro Traditionals (n = 142) or 9%		Cluster 2: Local Food Advocates (n = 294) or 19%		Cluster 3: Young, Engaged and Educated (n = 684) or 44%		Cluster 4: Health Driven and Educated (n = 238) or 15%		Cluster 5: Urban Value Seekers (n = 191) or 12%		Full Sample (n = 1549)	
	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.
Secondary Source of General Groceries (1 if Secondary/Seasonal Source)												
Supermarket	0.1338	0.3416	0.1769	0.3822	0.1813	0.3855	0.1849	0.3890	0.1518	0.3598	0.1730	0.3784
Health/Natural foods store	0.0352	0.1850	0.0476	0.2133	0.1184	0.3233	0.0798	0.2716	0.0942	0.2929	0.0884	0.2840
Supercenter	0.3592	0.4815	0.3844	0.4873	0.3173	0.4657	0.3109	0.4638	0.3037	0.4610	0.3312	0.4708
Farmer's market	0.0775	0.2683	0.0884	0.2844	0.0804	0.2721	0.0546	0.2277	0.0890	0.2855	0.0788	0.2695
Direct from producer (incl. farm/ranch, internet, mail)	0.0211	0.1443	0.0136	0.1160	0.0175	0.1314	0.0168	0.1288	0.0209	0.1436	0.0174	0.1309
Specialty food store (gourmet, ethnic delicatessen, etc.)	0.0634	0.2445	0.0476	0.2133	0.0599	0.2376	0.0798	0.2716	0.0681	0.2525	0.0620	0.2412
Source of Fresh Produce (1 if Secondary/Seasonal Source)												
Seasonal (Not Mutually Exclusive)												
Supermarket	0.0704	0.2568	0.0748	0.2636	0.0994	0.2994	0.0840	0.2780	0.0419	0.2009	0.0826	0.2754
Health/Natural foods store	0.0986	0.2992	0.1259	0.3322	0.1769	0.3819	0.1303	0.3373	0.1571	0.3648	0.1504	0.3576
Supercenter	0.2746	0.4479	0.2585	0.4386	0.2120	0.4090	0.2101	0.4082	0.1885	0.3921	0.2234	0.4166
Farmer's market	0.2817	0.4514	0.3197	0.4672	0.3129	0.4640	0.3277	0.4704	0.2565	0.4379	0.3066	0.4613
Direct from producer (incl. farm/ranch, internet, mail)	0.2254	0.4193	0.1633	0.3702	0.1652	0.3716	0.1050	0.3073	0.1675	0.3744	0.1614	0.3680
Specialty food store (gourmet, ethnic delicatessen, etc.)	0.1690	0.3761	0.1327	0.3398	0.1915	0.3938	0.1681	0.3747	0.1990	0.4003	0.1756	0.3806
Purchasing Habits (Frequency is daily, weekly, monthly, less frequently, or not at all												
Frequency of fresh produce purchases, general	2.1197	0.4373	2.2143	0.5588	2.1287	0.4602	2.1387	0.4613	2.1361	0.4615	2.1465	0.4794
Frequency of fresh produce purchases, direct from producers	4.0211	0.9261	3.9796	0.9198	3.9825	1.0050	4.3403	0.8505	4.2723	0.9729	4.0762	0.9655
Purchased more produce (=1 if yes compared to last yr)	0.5532	0.5025	0.5765	0.4971	0.6495	0.4782	0.7260	0.4491	0.6667	0.4761	0.6404	0.4804
Purchased less produce (=1 if yes compared to last yr)	0.2766	0.4522	0.3294	0.4728	0.2196	0.4150	0.1781	0.3852	0.1765	0.3850	0.2340	0.4239
Types of Fresh Produce Changes (If change in type)												
Kinds of produce (e.g. citrus to berries)	0.5294	0.5145	0.6429	0.4972	0.7234	0.4522	0.7273	0.4671	0.6154	0.5064	0.6667	0.4737
Production practice (e.g. organic)	0.1765	0.3930	0.1429	0.3631	0.5106	0.5053	0.1818	0.4045	0.1538	0.3755	0.3235	0.4701
Type of market (farmer's market, CSA)	0.5882	0.5073	0.2857	0.4688	0.5532	0.5025	0.3636	0.5045	0.3846	0.5064	0.4804	0.5021
Type of preparation (e.g., pre-cut)	0.1765	0.3930	0.6429	0.4972	0.2340	0.4280	0.2727	0.4671	0.1538	0.3755	0.2745	0.4485
Product attributes (color, variety)	0.2941	0.4697	0.3571	0.4972	0.2340	0.4280	0.2727	0.4671	0.2308	0.4385	0.2647	0.4434