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HOW DO CONSUMERS VALUE APPLES? A COMPARISON OF ORGANIC AND COLORADO PROUD LABELS

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The increasing attention and promotional investments being made in local and organic food programs leads to the question of how important and valuable such market differentiation is to consumers. In 2009, Colorado State University conducted a study to examine consumers' motivations for purchasing local (Colorado Proud) and USDA certified organic apples, and estimate how much consumers are willing to pay (WTP) for each of the two labels.

An Overview of the Study

In fall 2009, 300 shoppers were recruited to participate in an in-store experiment in partnership with a large food retailer in Northern Colorado. Shoppers were approached in the fresh produce department of the grocery store and asked to participate in a research experiment in exchange for a free gift. Participants were first invited to read two standardized paragraphs briefly describing the product attributes that "organic" and "local" labels certify (Figure 1).

Then, a choice slip describing three alternative gifts was presented:

1. the first option consisted of one pound of organic-local Gala apples (gift one),
2. the second (gift two) was either a pound of local non-organic apples *or* a pound of organic non-local apples, plus an amount of money (in cash) between $0 and $1.00, at random.
3. The third option ("gift three") was a cash-only gift that was slightly higher (by $0.05 or $0.10, at random) than the amount offered in option two.

To test the robustness of the experimental design, all apple quantities and cash gifts described above were doubled in three out of seven days (so that two pounds of apples were offered, and the cash gifts were between $0 and $5.00). Participants were not allowed to visually compare the apple gifts, and the three gifts were presented and labeled in random order to each participant. Once a gift was chosen and awarded, participants were asked to fill out a short questionnaire regarding food preference and socio-demographic characteristics, and the experiment ended.

The data compiled from the consumer questionnaires was used to investigate consumers' motivation and awareness of the local and organic labels.

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Certified (USDA) Organic		**This product meets the USDA federal requirement and is certified as organic. Foreign products sold in U.S. as certified organic are subject to USDA regulation.**
Locally Grown		**This product was grown or produced in Colorado**.

Figure 1: Organic and local labels used in experiment

Statistical modeling (a conditional logit model) was estimated to estimate consumers WTP for the two labels, using the data from the in-store choice experiment (see Costanigro et al. for details). [1]

Findings

Summary statistics on the customers showed that the majority of participants in the study were female (70 percent), which is consistent with previous food-based surveys of primary household shoppers (Reicks et al., 1999; Thilmany et al., 2006; Bond et al., 2008). The majority of those interviewed ranged from their mid-30s to late-60s, with an average age of 51.

Comparing some key statistics in our sample to the 2008 U.S. Census Data (United States Census Bureau) we note that race (84.7% white in 2008 Census data vs. 88% white in sample), income (median income for Colorado in the Census was $62,217 vs. median income of 50,000 to 74,000 in sample), and number of adults in the house (2.55 in Census vs. 1.93 in sample) are fairly similar to Colorado averages (see Figure 2 for income distribution).

Table 1 shows more detail on participants' apple preferences and awareness of the state promotional labeling program (Colorado Proud). A majority of shoppers buy apples at least once a week (60 percent), and about sixty percent of the sample reported eating apples twice per week or more (not surprising given they were intercepted in the fruit section of the store). 73 percent of consumers reported that they were aware of the Colorado Proud program, while a slightly smaller share, 65 percent, reported looking for the label when shopping (again, this was expected given the store's active participation in that promotional campaign).

To assess how product offerings affected supermarket choice, consumers were asked how important it was for them that the grocery store carried Colorado Proud products. On a scale ranging from 1 'Not important at all' to 7 'Very important,' the average shopper's score was 4.55, indicating a preference toward grocers carrying Colorado Proud products (figure 3). This is an important point to note as this consumer attitude, along with the staging of the experiment in a Colorado Proud program participating retailer, will influence our results.

[1] Costanigro, M.; D. Thilmany; S. Kroll and G. Nurse. Forthcoming in Agribusiness: an International Journal.

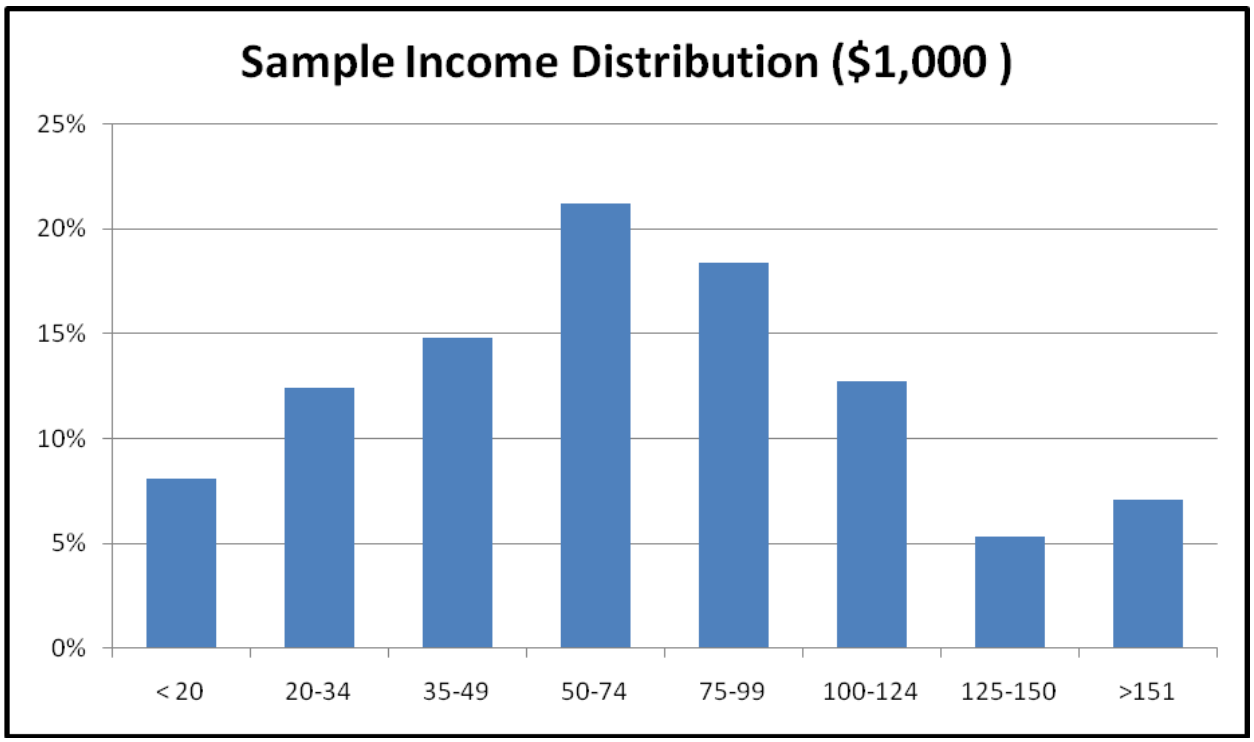

Figure 2: Income distribution ($ 1,000)

Table 1: Apple Preferences

Question		% of sample
How often do you buy apples?	Twice/week or more	13.7
	Once/week	45.7
	Once or twice/month	36.9
	Rarely/Never	3.4
How often do you eat apples?	Twice/week or more	62.6
	Once/week	20.1
	Once or twice/month	14.6
	Rarely/Never	2.7
Pounds of apples at home currently	Less than a pound	43.2
	1 pound	25.7
	1-3 pounds	24.0
	> 3 pounds	5.4
	Don't know	1.4
Were you planning to buy apples today?	No	44.6
	Yes	55.4
Aware of 'Colorado Proud'	No	27.1
	Yes	72.9
Looked for 'Colorado Proud'	No	35.4
	Yes	64.6
Importance of 'Colorado Proud' (scale 1-7)	Mean	4.5
	StdDev	1.4

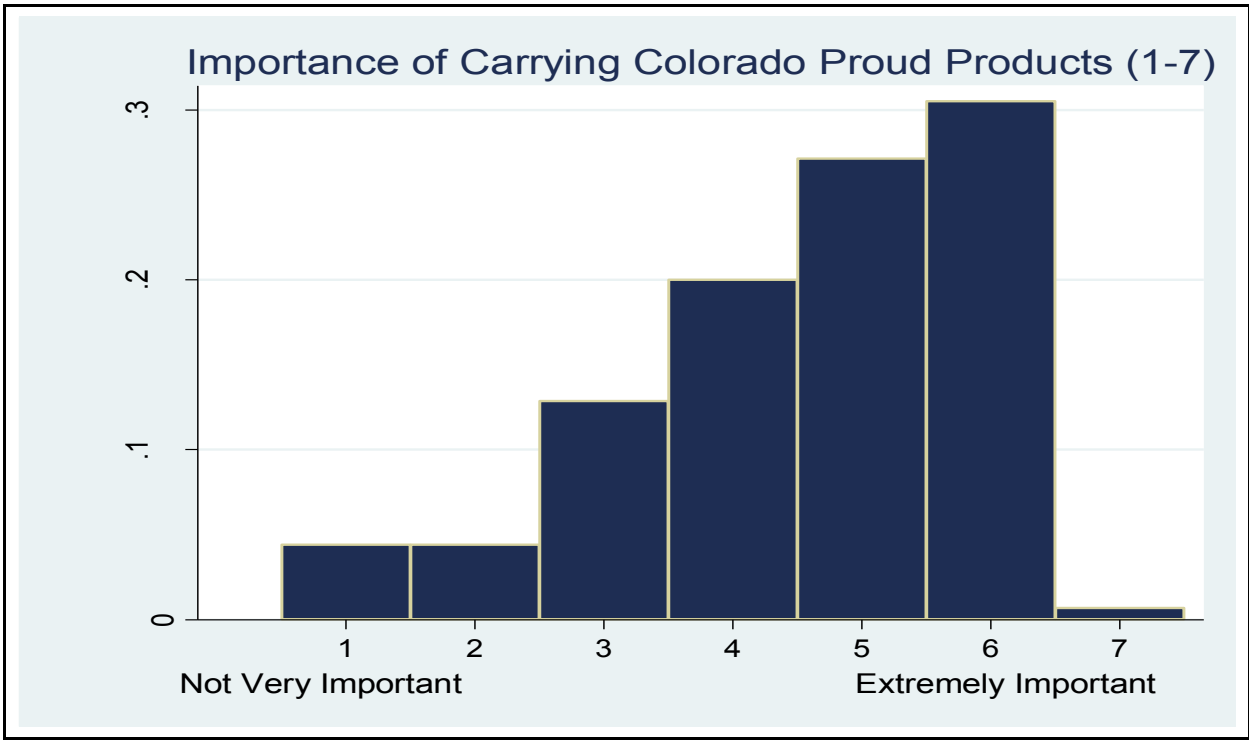

Figure 3: How important is it that your local store carries Colorado proud Products?

There was also interest in exploring how preferences for general produce attributes relate to preferences for Colorado Proud, and obtain a characterization of the typical consumer interested in Colorado Proud. To identify key attributes influencing purchase choice, each participant was asked to rank, in order of importance, at least four out of seven possible "food values" associated with produce choices. Figure 4 presents the percentage of participants that ranked each food value in the top two, showing that "taste/visual appeal" and "healthfulness/nutrition" are the two most important consideration driving produce choices, followed by "good value," "convenience," "environmental impact," "preserve farmland" and "social fairness".

A Closer Look at Consumer Behavior

Preferences for Colorado Proud and other produce attributes are analyzed by means of factor analysis, a statistical process useful in reducing the information in a larger dataset into key factors that explain differences among shoppers. In Table 2, results from the factor analysis model are shown. It appears that some of the more public-oriented food attributes drive one key factor that differs among shoppers, followed by a couple of factors with more private benefits (time saving or eating quality).

The interpretation of the first factor, accounting for 26% of the deviation from the sample average, is that shopper who ranked "environmental impact", "social fairness", and "preserve farmland" higher than average, also tend to value convenience and the Colorado Proud label slightly more. The second factor suggests that respondents who ranked "convenience" and "good value" higher than the average tend to discount the importance of having local food available. The third factor is essentially a contrast between healthiness/ nutritional value and taste and visual appeal: consumers who seek healthy choices may be willing to sacrifice taste and visual appeal (and vice versa).

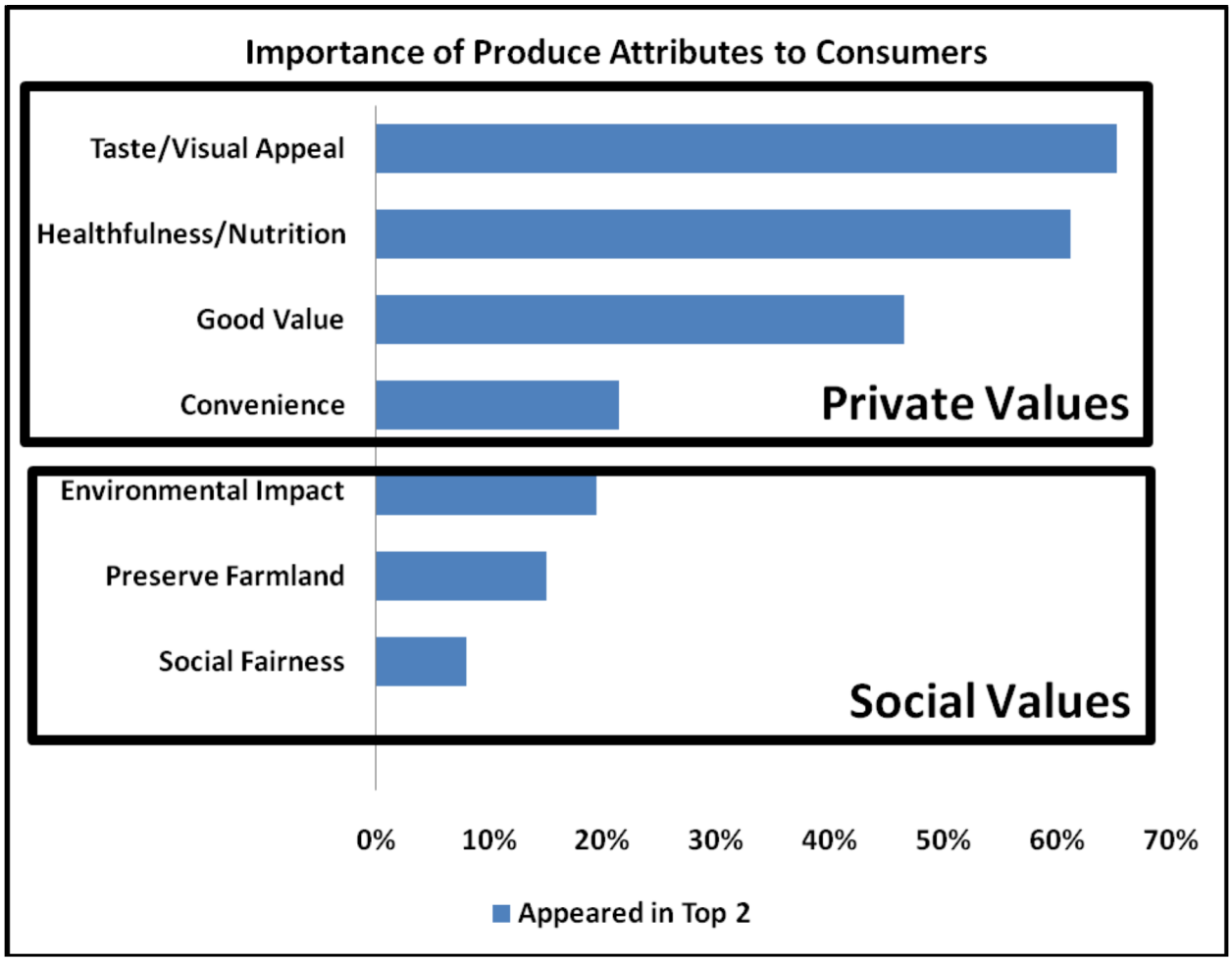

Figure 4: Importance of a variety of fresh produce attributes

Table 2. Factor Analysis (Principal Component Solution)

Variable	Factor1	Factor2	Factor3	Uniqueness
Convenience	0.394	**0.597**	-0.052	0.486
Good Value	0.038	**0.722**	0.045	0.475
Health/Nutrition	0.049	-0.261	**-0.660**	0.494
Taste/Visual	0.053	-0.134	**0.806**	0.329
Environmental Impact	**0.701**	0.003	-0.309	0.414
Social Fairness	**0.802**	0.202	0.168	0.289
Preserve Farmland	**0.801**	-0.177	0.023	0.326
Colorado Proud	0.367	**-0.608**	0.043	0.494
Proportion	**0.259**	**0.176**	**0.152**	
Cumulative	0.259	0.435	0.587	

Estimates from a model of all these variables was completed and estimates of per-pound average WTP estimates are presented in table 3.

Table 3. Willingness to Pay Estimates for Local and Organic Attributes (per pound)

Organic	Local
$0.20	$1.18
(0.166)	(0.434)
0.239	0.007

In our choice experiment, the "average" participant was willing to "trade" the Local and Organic apples, in exchange for apples that were only local if 20 cents were offered as monetary compensation. On the other hand, the "average" compensation needed for switching from Local and Organic apples to those only certified as Organic was $1.18. In other words, **willingness to pay for the organic** label was estimated to be **20 cents/lbs**; while the **willingness to pay for the local label is $1.18 on a per pound basis**.

Conclusion

Based on our results, it is clear (and perhaps unsurprising) that privately appropriated values (convenience, value, nutrition and taste) drive food choices much more strongly than social welfare values (social fairness, environmental impact and preserve the farmland). However, for those who valued the social attributes, it was a significant factor driving their choices.

Although this study was conducted on fresh apples, this finding may broadly apply to food products. The statistical analysis showed that value and convenience-oriented consumers discount the Colorado Proud label, while consumers who attribute more importance to social welfare values are more interested in local products. Interestingly, most consumers are aware and look for the Colorado Proud label.

As a testament to the effectiveness of local promotional campaigns done in partnership with retailers, willingness to pay for the Colorado Proud label (estimated at $1.18/lbs) trumps the value of the organic one (estimated at $0.20/lbs). This is important to note since the certification and costs associated with organic are likely higher than the marketing strategies required of a Colorado Proud grower. While we don't have any clear evidence regarding the rationale for this finding, some discussion is warranted. One possibility is that the local label may be a much more effective instrument for product differentiation than the organic one. That is, the perceived difference between local and non-local apples is significantly larger than that between organic and non-organic ones. Furthermore, organic products have become "mainstream" and are available in most supermarkets, while local products may still be considered a novelty. It is therefore possible that the "local" premium will decrease in the future if more local marketing channels develop.

There are two principal caveats when considering our results. The first one regards the so-called "stated preference bias": when filling out questionnaires, there is no cost for the consumer in saying that they would pay a lot for a given product; thereby increasing estimates. While we completely eliminated this effect from our WTP experiment (by offering real money), this effect may still somewhat influence the answers provided in the questionnaires. The second caveat regards the so-called "social desirability" bias, where participants may be led to overstate the importance of a value, either because they wish to "look good" in the eye of the experimenters, or because they wish to simply state a principle. These factors are absent from normal, everyday shopping experiences. In summary, the monetary estimates obtained in this study should be considered as an "upper bound" of consumer willingness to pay, rather than an accurate estimate, but there is no reason to believe that the relative value of local vs. organic is biased by this approach.