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Moderator: Dr. James E. Epperson
University of Georgia
Athens, GA

Branding Locally Grown Produce in Supermarkets

by

John R. Brooker
Professor, Dept. of Agricultural Economics and Rural Sociology
University of Tennessee
Knoxville, TN

David B. Eastwood
Professor, Dept. of Agricultural Economics and Rural Sociology
University of Tennessee
Knoxville, TN

Carol L. Stout
Former Graduate Research Assistant
Dept. of Agricultural Economics and Rural Sociology
University of Tennessee
Knoxville, TN

Robert H. Orr
Associate Professor, Dept. of Agricultural Economics and Rural Sociology
University of Tennessee
Knoxville, TN

The branding of fresh produce by food companies and the promotion of locally produced products by state departments of agriculture have accelerated in recent years [*The Packer*, Jan. 24, 1987; *The Packer*, Jan. 31, 1987]. According to *The Packer*, food companies have aggressively campaigned during the 1980s to increase their market share through brand recognition. In a 1986 nationwide household survey, it was revealed that branded produce items were generally rated by consumers to be equivalent to nonbranded items [Zind]. State-level sponsorship of produce promotion has taken numerous forms, from national television and magazine advertisements to within-state promotion that includes the use of logo-stickers [Larson]. These efforts are designed to enable growers to "brand" their products on the basis of the state in which they are grown. In the same

1986 national household survey, country- or region-of-origin labeling of fresh produce was not identified by consumers as a highly important criterion in selecting produce or a produce market. However, the survey results did reveal that origin ranked above national label brand names in position of importance. This suggests that origin-related promotion has more potential than national label brand names for increasing the sales of locally grown produce.

While considerable demand research has been completed regarding consumers' interest in produce at direct market outlets, little research has been published regarding consumers' interest in locally grown produce at major retail food stores [Brothers and Love; Trotter and Brewer]. Considering the moderate increase in produce demand anticipated over the next few years and the nationwide interest in expanded produce production, growers in non-major production regions are concerned about the availability of adequate markets [Estes]. One market outlet that may offer some potential for expanded sales of local produce is the regional supermarket chains. Due to the competitive nature of these retail food stores, the cost and revenue of merchandising locally grown produce will ultimately determine whether the retailers will handle locally grown produce. So little is known about the revenue from (demand for) locally grown fresh produce that the profitability of handling locally grown fresh produce is difficult to determine.

Objectives

The general goal of this study was to learn more about consumers' demand for locally grown fresh produce through an examination of actual purchasing behaviors when confronted in supermarkets with fresh tomatoes branded as locally grown. Two specific objectives were to:

1) analyze consumers' actual retail store purchases of locally grown tomatoes when presented with various pricing and labeling situations and
2) analyze perceptions, attitudes, and socio-economic characteristics of consumers who purchased locally grown tomatoes.

Procedure

Two different techniques were used to obtain primary data from consumers of fresh tomatoes. First, the actual purchase activity of customers was monitored during experiments conducted in three retail food stores in Knox County, Tennessee. Second, customers who purchased bulk tomatoes were asked to return a mail-in questionnaire.

Within each of the participating retail stores, sales experiments were conducted for four days in each of two consecutive weeks of July, 1986. The experiment days were Wednesday through Saturday. A random assignment of stores and treatments took place. One supermarket was randomly drawn, and the experiments randomly assigned to each of the four-day periods. Then, the second and third stores were drawn and the sequencing of the experiments assigned to prevent the same experiment from being conducted in more than one store on any day.

During one day of each week in each store a benchmark experiment was conducted. This experiment consisted of two bulk bins of tomatoes of similar size and appearance, separated by avocados and prepackaged tomatoes. During the benchmark experiment there was no information as to tomato origin of either bin, and the price per pound was the same for the tomatoes in both bins. One of the bulk bins contained the tomatoes supplied by the retailer's own organization, unchanged from what was routinely handled before, during, and after the test experiments. The second bulk bin of tomatoes was stocked with locally grown tomatoes delivered to the retailers each morning of the experiment days by a local independent Knoxville wholesaler. The local tomatoes were inspected by a state inspector who graded each delivery to certify that the tomatoes satisfied U.S. Department of Agriculture grading standards to be classified as U.S. No. 1, large or extra large.

Table 1. Weighted average per day bulk tomato sales by origin during the test period

Brand logo on local tomatoes	Price of local tomatoes[a]	Bulk tomatoes sold[b]					
		Local		Other		Total	
	cents	pounds	percent	pounds	percent	pounds	percent
No	89	201.7	61	128.8	39	330.5	100
Yes	89	226.9	69	100.2	31	327.1	100
Yes	104	234.4	65	125.7	35	360.1	100
Yes	119	182.9	64	105.1	36	288.0	100
Yes	139	106.0	43	142.7	57	248.7	100

[a]The price for the "other" tomatoes was 89 cents per pound.

[b]Weighted Saturday equivalent of bulk tomato sales per retail store.

In order to gather data on the effectiveness of a state-of-origin "branding" logo, the second treatment per week per store pertained to charging the same price for both types of tomatoes, but the locally grown tomatoes were identified by individual logo stickers placed on them. The dime-sized stickers were white with green lettering that read "Tennessee--Country Fresh" (TCF). This experiment was conducted once each week in each store. These logos were introduced without any type of media coverage. Although the Tennessee Department of Agriculture developed the logo, it had not been used in any type of promotional activity, either public or private.

The experiments during the remaining two days of each week involved using the logo identification stickers and setting the price of the locally grown tomatoes 15 cents, 30 cents, and 50 cents per pound above the retailer's price for the "other" bulk tomatoes. All three retail stores priced their own bulk tomatoes at 89 cents per pound over the two-week period of the in-store experiments.

Consumer Purchases During In-Store Experiments

Bulk tomato sales by actual volume per day varied considerably. Sales on Wednesday, Thursday, and Friday were weighted by the reciprocal of the average volume per day relative to Saturday. This weighting procedure permitted more meaningful comparisons of sales volumes for different days of the week.

When the prices of the local tomatoes and the "other" tomatoes were equal, with no branding as to origin, the local tomatoes accounted for 61 percent of the weighted bulk tomato sales (Table 1). The fact that the local tomatoes accounted for well over half of the bulk tomatoes, other things being equal, emphasizes the quality of the local tomatoes placed in the stores for this experiment. The proportion of total per day bulk tomato sales accounted for by the locally grown tomatoes increased from 61 to 69 percent when the TCF brand logo was placed on each tomato as point-of-purchase advertisement, and when prices were equal for all bulk tomatoes. Thus, presence of the TCF brand increased adjusted sales on average by 8 percent relative to total sales. An important point is that this was accomplished without any advertising to inform consumers about the TCF brand and what it represented. These results seem to support the hypothesis that the TCF brand would have a positive effect on sales of locally grown tomatoes in supermarkets.

Setting the price per pound of the locally grown produce 15 cents above the "other"

bulk tomatoes, with the TCF brand present, caused the proportion of sales accounted for by the local tomatoes to decline from 69 to 65 percent. The proportion of local tomato sales was 64 percent when the local tomato price was set 30 cents above the "other" tomatoes. Raising the price of local tomatoes 50 cents above the "other" tomatoes resulted in a 26 percent decline in the proportionate share of local tomatoes purchased. One interpretation of this response is that the income elasticity of demand for local tomatoes at this price level is encouragingly inelastic, because the percentage reduction in the purchases of locally grown tomatoes was less than half the percentage increase in the price. In other words, as long as the consumers' response to a price increase indicates that the elasticity coefficient is inelastic, then the retailer may increase total returns with a price increase.

These results seem to support the hypothesis that the TCF brand would have a positive effect on sales of locally grown tomatoes, assuming equal or superior quality. Also, the consumers' demand for locally grown tomatoes seems to be quite inelastic over price adjustments up to 30 cents (33%) above the "other" tomatoes. An important inference from examination of the in-store sales experiments is that some consumers must perceive locally grown tomatoes as a premium product worth a higher price than the "other" tomatoes. An unanswered question regarding the profitability of handling locally-grown fresh produce is whether this 15 to 30 cents price increase for local tomatoes is adequate to cover possibly greater handling expenses required by the retailer to cover the wholesaler-repacker's expense of sorting, packing, and grading.

Purchaser Responses From Mail-In Questionnaires

A total of 1,167 questionnaires were distributed to bulk tomato purchasers in the three retail food stores during the six experiment days that the TCF brand was used. Usable questionnaires were returned by 242 of these purchasers. There were two parts to the questionnaire. One focused on tomato evaluations, and the other gathered socioeconomic information. The following discussion focuses first on responses to the tomato questions alone. Then attention turns to relationships among these responses and socioeconomic characteristics.

The purchasers responding to the mail-in questionnaire were divided into two groups based on a yes or no answer to the question "Do you care where fresh tomatoes are grown when you consider purchasing them?" Cross classifying this question with the yes or no response to the question "Did the TCF logo-sticker affect your decision?" revealed a significant relationship at the one percent level (Table 2). In other words, there is a strong relationship between those "who care" where tomatoes they purchase are grown and those who purchase TCF brand tomatoes.

The relationship between those purchasers "who care" and those who were "influenced" in their purchase decision by the TCF brand was also significant at the one percent level (Table 2). One possible interpretation of this finding could be that the TCF brand does provide effective information to at least one segment of the shopping public. More research is required to be able to estimate the potential impact of such market segmentation (targeting products and/or advertisements for particular segments of society) for Tennessee produce growers and other industry participants.

The cross tabulation of those "who care" and those who would "shop at a particular store because TCF produce is available" revealed a significant relationship (Table 2). One possible inference here is that the use of the TCF brand, or a similar method to inform consumers, could be used to satisfy that segment of shoppers who have a desire to purchase locally grown produce.

Probit model

Previous research has identified socioeconomic variables that are determinants of consumers' perceptions of locally grown fresh produce and determinants of consumer demand for fresh produce [Eastwood, Orr, and Brooker]. The mail-in questoinnaire contained three behavioral questions that may be con-

Table 2. Comparisons of responses to "Tennessee--Country Fresh" logo based on purchasers' concerns about origin of the tomatoes for sale at retail chain stores, Knoxville, Tennessee, 1986

		Care where tomatoes are grown:						
		Yes			No			Total
Item		Actual	Expected	Percent	Actual	Expected	Percent	Percent
Purchased the TCF labeled tomatoes:	Yes	152	143	66	62	71	27	93
	No	3	12	1	15	6	6	7
	Total	155	155	67	77	77	33	100
		Chi-square = 22.13		Significant at .01 level			n = 232	
Influenced in purchase decision by TCF logo:								
	Yes	121	93	52	21	49	9	61
	No	32	60	14	59	31	25	39
	Total	153	153	66	80	80	34	100
		Chi-square = 61.6		Significant at .01 level			n = 233	
Shop at a particular store because TCF produce available:	Yes	107	92	48	34	48	15	63
	No	38	53	17	42	28	19	36
	Total	145	145	65	76	76	34	99[b]
		Chi-square = 18.23		Significant at .01 level			n = 231	

[a]Percentages based on number of responses to each cross tabulation.
[b]Does not equal 100 due to rounding error.
Source: Mail-in questionnaires from purchasers of bulk display tomatoes. Not all respondants answered every question.

sidered dependent variables in consumer decision making (Table 3). The socioeconomic information included as independent variables are presented in Table 4. Each of the dimensions of decision making was measured qualitatively. This necessitated the use of a qualitative dependent variable regression model to estimate the effects of the hypothesized independent variables on the probabilities of observing the yes/no responses. A probit specification as developed by McKelvey and Zavoina was used here.

Initial probit regressions were calculated for each dependent variable category using all independent variables. Categories which had insignificant coefficients were deleted and new regressions computed. The authors recognized that this process may introduce a statistical problem referred to as pretest bias, but this was considered acceptable based upon the existing literature.

Estimated equations

Table 5 presents the estimated probit equations. Measures of overall fit associated with each dimension of decision making lead to inferences of significant overall relationships. The chi square statistics are significant, the R^2-like values are relatively high for cross-section data, and the percents correctly predicted are larger than the frequencies of occurrence associated with the dependent variables.

Significant determinants of the care-where-grown responses fall into two groups: comparative attributes and age distribution of the respondent. All of the comparative criteria variables have significant coefficients. Respondents who consider local tomatoes to have "better" freshness, taste, storage life, and nutrition are more likely to care where tomatoes are grown, whereas those who consider local tomatoes "better" in appearance and price are less likely to care. These results suggest the visual appearance of local tomatoes does not lead to consumers caring about where they are grown. Similarly, price alone does not seem to be a reason for caring where tomatoes are grown. These results are consistent with consumers continuing to buy comparable-grade local tomatoes at higher prices during the in-store experiments. Older respondents, *ceteris paribus*, are more likely to care where tomatoes are grown. This is assumed to reflect their greater interest in food preparation and/or having purchased local tomatoes in previous time periods when local ones were all that were available.

Table 3. Dependent variables hypothesized to be affected by household characteristics of shoppers and by attributes of fresh tomatoes for sale at retail stores

Variable	Behavioral Questions[a]
CARE	Do you care where fresh tomatoes are grown? (Yes = 2, No = 1)
STICKER	Did the "Tennessee Country Fresh" sticker affect your purchase decision? (Yes = 2, No = 1)
SHOP	Would you shop at a particular supermarket if you knew beforehand that the store featured "Tennessee Country Fresh" produce? (Yes = 2, No = 1)

[a]See Table 2 for response frequencies.

Table 4. Independent variables hypothesized to affect tomato purchases at retail stores

Variable	Measurement
	Attribute Comparisons: how do "Tennessee Country Fresh" tomatoes compare to other fresh tomatoes in terms of:
Freshness	= 1 if better, = 0 otherwise
Taste	= 1 if better, = 0 otherwise
Appearance	= 1 if better, = 0 otherwise
Storage Life	= 1 if better, = 0 otherwise
Price	= 1 if better, = 0 otherwise
Nutrition	= 1 if better, = 0 otherwise
Both Work	= 1 if both spouses in the household are employed, = 0 otherwise
Homemaker	= 1 if one person in the household is a homemaker, = 0 otherwise
	Educational Attainment:
ED1	= 1 if 8th grade or less, = 0 otherwise (omitted category)
ED2	= 1 if 9th-11th grade, = 0 otherwise
ED3	= 1 if high school graduate, = 0 otherwise
ED4	= 1 if 1-3 years of college, = 0 otherwise
ED5	= 1 if college graduate, = 0 otherwise
	Total Household Income:
INC1	= 1 if $0-$9,999, = 0 otherwise (omitted category)
INC2	= 1 if $10,000-$19,999, = 0 otherwise
INC3	= 1 if $20,000-$29,999, = 0 otherwise
INC4	= 1 if $30,000-$39,999, = 0 otherwise
INC5	= 1 if $40,000-$49,999, = 0 otherwise
INC6	= 1 if $50,000 or more
	Age of the Respondent:
AGER1	= 1 if under 25, = 0 otherwise (omitted category)
AGER2	= 1 if 25-34, = 0 otherwise
AGER3	= 1 if 35-44, = 0 otherwise
AGER4	= 1 if 45-54, = 0 otherwise
AGER5	= 1 if 55-64, = 0 otherwise
AGER6	= 1 if 65 or over, = 0 otherwise

Table 5. Results of the probit regressions

Independent variables[a]	Dependent variables[b]					
	CARE		STICKER		SHOP	
Constant	-.507*	(-2.99)[c]	-.269	(-.74)	-.647*	(-2.11)
Freshness	.509*	(1.78)	.528*	(1.84)	.656*	(3.16)
Taste	1.008*	(3.27)	.839*	(2.69)		
Appearance	-.433*	(-1.80)	-.440*	(-1.87)		
Storage Life	.674*	(2.11)	1.190*	(3.42)		
Price	-.680*	(-1.94)				
Nutrition	.720*	(2.06)	.488	(1.51)	.771*	(2.49)
Both Work					.506*	(2.09)
Homemaker					1.070*	(3.90)
ED3			-.461*	(-1.76)		
INC2			-1.394*	(-2.66)	1.193*	(3.30)
INC3			-1.345*	(2.62)	.678*	(2.01)
INC4			-1.214*	(-2.44)		
INC5			-1.168*	(-2.02)	.898*	(2.36)
INC6			-1.315*	(-2.58)	.893*	(3.50)
AGER2			.815*	(1.71)	-.868*	(-2.98)
AGER3			1.210*	(2.45)	-.832*	(-2.73)
AGER4			1.065*	(2.07)	-.690*	(-2.16)
AGER5	.672*	(1.78)	1.722*	(2.91)		
AGER6	.767*	(1.94)	.938*	(1.88)		
Log Likelihood	-115.16		-118.45		-114.84	
Chi Square	77.49		75.83		63.47	
R^2-like[d]	.43		.50		.41	
Percent Correctly Predicted	.77		.72		.77	

*Significant at .05 level. [a]See Table 4 for definitions. [b]See Table 4 for definitions. [c]Asymptotic t value. [d]Ratio of the explained variance to the total variance.

Comparative criteria are significant determinants of the TCF brand affecting purchase decisions. Respondents who consider local tomatoes as "better" with respect to freshness, taste, storage life, and nutrition were influenced by the brand. The appearance rating led to respondents not being affected by the brand. Consumers who were high school graduates or who had incomes above the lowest category indicated they were not influenced by the TCF brand. These shoppers use other criteria than the presence of the brand in purchase decisions.

The third evaluation is that of store patronage being affected by the availability of local produce. Results indicate that consumers who consider local tomatoes to have "better" freshness and nutrition are more prone to shop at stores where local produce is available. Households where the wife did not work outside the home are more likely to patronize supermarkets that handle local produce. Also, most income groups relative to the lowest income group would be influenced to shop at retail stores that featured locally grown produce. Respondents in the 25-54 age group are less likely to be influenced by the availability of local produce.

Concluding Remarks

The in-store tomato sales experiments revealed a favorable consumer response to the locally grown tomatoes. Consumers shopping at the three retail stores participating in this project demonstrated a positive purchasing response towards the locally grown tomatoes on the basis of quality alone (U.S. No. 1 Extra Large and Large). An important implication of this finding is that retail shoppers may need to be informed as to what the local brand represents. Wholesalers, retailers, and others working with the Tennessee fruit and vegetable industry could work together to educate Tennessee consumers as to the purpose or meaning of the TCF brand.

While 92 percent of the respondents to the mail-in questionnaire reported purchasing the TCF tomatoes, only 61 percent reported the TCF brand influenced their purchase decision. Evidently, many of the local tomato purchasers did so because of the physical appearance of the local tomatoes, not because they were persuaded to buy a Tennessee produced product. Among the quality attributes examined, consumers ranked color, feel, and blemishes as the three most important. Therefore, it seems apparent that use of a brand to identify locally produced products cannot be expected to overcome a deficiency in overall quality. Also, a promotional campaign relating desirable features of local produce to the TCF brand is necessary. An unanswered empirical question at this point is whether the marginal increase in sales is adequate to cover the added costs of developing and using the TCF brand.

A reasonable marketing strategy could be to build upon consumers' attribute comparisons of local versus "other" tomatoes. Emphasis would be given to freshness, nutrition, taste, and storage life. Previous research has shown that consumers need information about these attributes, and the present results indicate that providing this needed information could have positive results. Use of the TCF brand could be a way of reminding consumers about these desirable properties. Such promotional activities could be directed at broad socio-economic groups of households. Throughout a promotional program, adequate quality control would probably be essential for efforts to create consumer confidence in the TCF brand.

References

Brothers, Jane R. and Harold G. Love. "State Oriented In-Store Merchandising Techniques," *Journal of Food Distribution Research*, Vol. XII, No. 1, Food Distribution Research Society, February, 1981.

Eastwood, David B., Robert H. Orr, and John R. Brooker. *Consumer Stated Preferences for Fresh Fruits and Vegetables*, Research Report 86-06, Department of Agricultural Economics and Rural Sociology, University of Tennessee Agricultural Experiment Station, Knoxville, April, 1986.

Estes, Edmund. "Alternative Cash Crops: How Big Is The Market," *Analyzing the Potential for Alternative Fruit and Vegetable*

Crop Production Seminar, Seminar sponsored by S-178 Technical Committee and Farm Foundation, New Orleans, Louisiana, November 4, 1985.

Larson, Jerry D. *State Marketing Profiles*, Oregon State Department of Agriculture, Report for Agricultural Development and Marketing Division, 1982.

McKelvey, Richard D., and William Zavoina. "A Statistical Model for the Analysis or Ordinal Level Dependent Variables," *Journal of Mathematical Sociology* 4 (1975): 103-20.

The Packer. "Neighboring States Follow Different Paths to Season's Promotion Efforts," *The Packer*, Vance Publishing Corporation, 7950 College Boulevard, Overland Park, Kansas, 66210, January 24, 1987.

_____. "Assessing State of the Trade," *The Packer*, Vance Publishing Corporation, 7950 College Boulevard, Overland Park, Kansas, 66210, January 31, 1987.

Trotter, C. E. and T. A. Brewer. *Consumer Reactions to Fresh Apples Market in Allentown - Bethlehem, Pennsylvania, 1974-75*, Bulletin 816, Pennsylvania State University, Agricultural Experiment Station, University Park, December, 1977.

Zind, Tom, Assistant Editor. "Produce Capturing Large Slice of Dietary Pie," *The Packer*, Vance Publishing Corporation, 7950 College Boulevard, Overland Park, Kansas, 66210, January 10, 1987.