A Case Study of Promoting Fresh Beef Through In-store Demonstrations

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Abstract

In-store demonstrations are becoming a popular way of promoting foods at the retail level. However, little information is available to guide store managers and marketers in the design and implementation of these promotions. A test demonstration for shoulder and top blade steaks is used to estimate the effects of discretionary components of this promotional strategy. Marketing implications are drawn.

Introduction

Manufacturers, commodity groups, and retailers have allocated substantial resources to advertising and promotion programs to sway consumer spending (e.g., Jensen and Schroeter, Ward). Among the merchandising alternatives, in-store activities are particularly well-suited for influencing food shoppers in the environment where purchases are made. Consequently, increased attention is being directed toward this advertising strategy. New technologies are being applied to some traditional approaches, such as point-of-purchase coupon dispensers, aisle video displays, and frequent shopper programs. Despite these innovations, in-store demonstrations remain effective. Nevertheless, little is known about the impacts of the various components of this marketing tool on sales (Partch, Litwak, and Cepeda).

Results of a study designed to provide some measures of the effectiveness of selected components of an in-store demonstration are presented. These measures pertain to key features that can be managed by merchandisers, and they have implications for the costs of demonstrations. The duration of the promotion (number of consecutive weeks), the interaction between pricing and a demonstration, the income of the neighborhood in which a store is located, and the background expertise of the demonstrators are considered in the analysis.
Two cuts of beef steak were used in the study: shoulder and top blade. Consequently, points addressed in the study provide useful information for the beef industry and fresh meat departments of retail outlets. Furthermore, the results extend to other foods because the discretionary components, noted above, are common to all in-store demonstrations.

Methodology

Key components of any in-store demonstration include the information content, days and hours of operation, use of price incentives, and background and training of the demonstrators. The first two components were somewhat predetermined in the present study. The Beef Industry Council had developed a marinate and grill campaign that emphasized shoulder and top blade steaks. Based upon the experience property (Eastwood) of these steaks, a grilling demonstration was used in the fresh meat departments of supermarkets. Days and hours of operation were chosen to maximize exposure to food shoppers with the constraint of a limited budget. Reduced prices were used, although the steaks had been for sale at the same low level a few weeks prior to the experiment. Health concerns about fresh beef raised the question of whether additional expenses ought to be incurred to employ people who have nutrition/dietary expertise, as opposed to demonstrators who do not.

A marinate and grill demonstration featuring shoulder and top blade steak was developed. Demonstrations took place during the major shopping days of Friday (10:00am to 6:00pm) and Saturdays (11:00am to 7:00pm) over the four consecutive weeks ending Oct. 6, 1990. Data were derived from the scanner records of five supermarkets located in a metropolitan area in the Southeast and were part of the same chain. For this study the time period spanned the weeks ending May 14, 1988 through October 6, 1990.

The number of times scanners read individual bar codes (item movement) during a week and the price per pound were obtained from the scan data records. Eastwood, Gray, and Brooker point out that item movement can serve as a proxy for pounds sold. This is based on the realization that the distribution of package sizes for a cut of beef does not change very much from week to week. As a result changes in pounds sold would be largely reflected by changes in item movement.

The experimental design had the following features. One of the five stores did not have the demonstration, so it served as a control store. Two stores used demonstrators who had nutrition/dietary training, and two used demonstrators who did not. Of the four test stores, two were located in higher income areas, and two were located in more moderate income areas. The control store was on the border between high and low income neighborhoods. A nutrition/dietary demonstrator was in a higher and a lower income store, as was a nonnutrition person. In order to adjust for differences in patronage, weekly item movements were divided by the corresponding weekly customer counts. Table 1 presents the experimental design.

A regression model was constructed. There were 130 weeks in the overall scan data record of the five stores. Missing observations for some stores in some weeks resulted in there being 235 item movement per thousand customer observations for the five stores. The dependent variable was weekly item movement of top blade and shoulder steaks in each of the five stores. The following independent variables were used in addition to the price per pound (PRICE). A dummy variable to denote whether a test week (TEST) was involved was added. Whether the demonstrator had a nutritional/dietary background was included (NUTR). Dummy variables for higher and lower income stores versus the control supermarket were used (INCOMEH and INCOMEL). Because the demonstration was associated with lower prices, the interaction

Table 1

Experimental Design for Demonstrators in the Higher and Lower Income Stores.

	Stores				
Week	Higher Income	Control	Lower Income	Lower Income	Higher Income
1	N/D	None	N/D	Usual	Usual
2	N/D	None	N/D	Usual	Usual
3	N/D	None	N/D	Usual	Usual
4	N/D	None	N/D	Usual	Usual

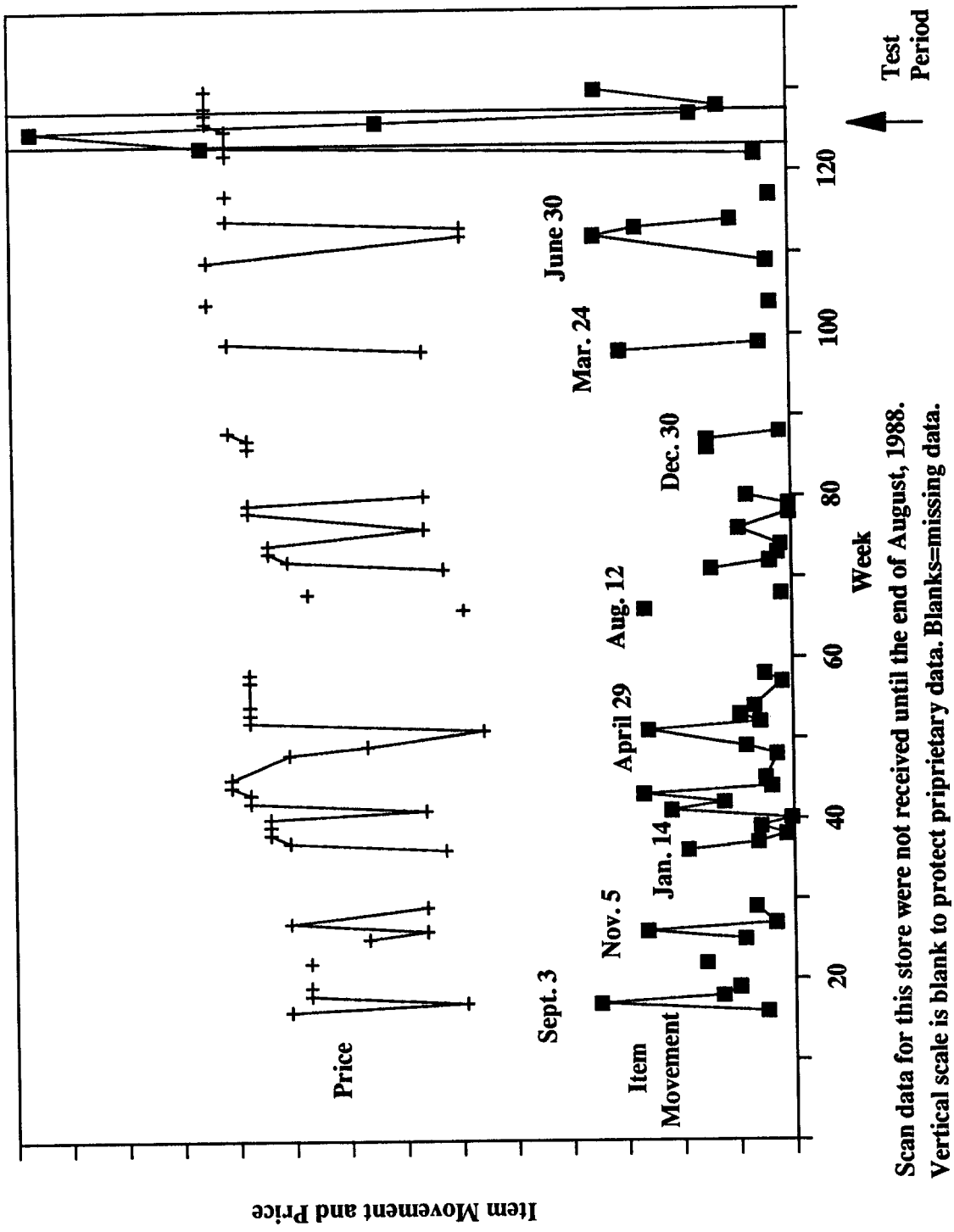
N/D=nutrition/dietician demonstrator, Usual=regular demonstrator, None=no demonstration.

Table 2

Shoulder and Top Blade Steak Regression: Item Movement per Week per Thousand Customers.

Variable	Coefficient	t value	
Constant	.0038	7.42	
PRICE	-.0013	-6.78	
TEST	.0130	6.40	
INCOMEH	.0006	2.02	R^2 = .46
INCOMEL	.0005	1.64	
NUTR	-.0001	-0.45	F = 32.94
PRICETEST	-.0037	-4.63	

Figure 1. Top Blade and Shoulder Steak Weekly Item Movement Per Customer for a Store



Scan data for this store were not received until the end of August, 1988.
Vertical scale is blank to protect priprietary data. Blanks=missing data.

between PRICE and TEST was included (PRICETEST).

Other advertising and promotion variables were not included because they were not specific to one of the five stores. That is, other than the in-store demonstrations, there were no differences in the economic environments among the stores. Newspaper, television, and radio advertising was common to the supermarkets, as were competitors' activities. Consequently, the relevant analyses centered on test versus control stores, given that all five stores would be affected in similar ways by the competitive environment. The modeling involved using TEST, INCOME, and NUTR as class variables in the Generalized Linear Models algorithm of the Statistical Analysis System. This approach was followed to obtain not only OLS regression results, but also, to obtain Type I and Type III sums of squares for subsequent analyses.

Results

Price and item movement data for each of the stores were examined for the entire period. Figure 1 shows the weekly levels of price and item movement for one supermarket. Space limitations preclude presenting all of the figures. Plots of these data showed that lowering the price was almost always associated with increases in item movement per customer. Cycles of item movement per customer suggested that when food shoppers purchase these steaks, they tended to be eaten over the ensuing weeks, causing lower sales. No trends in either the item movements or customer counts by store were found. Lowering the price around the Fourth of July and Labor Day seemed to have had the best quantity response outside of the test period. The data encompass three fall seasons, and the test took place two weeks after Labor Day. Examination of the plots indicated that item movement did not appear to be unusually high for the comparable periods in 1988 and 1989. Other weeks of very high item movement per customer generally occurred with low holiday prices. Also, there were nontest weeks that had the same or lower prices, and these weeks did not experience higher item movements. Following the demonstration period, item movements returned to previous levels.

Inspection of the weekly data for the demonstration stores during the test period indicated several weeks of high sales. None of the stores had a comparable period of sustained high sales. In the third or fourth week there was a decline in item movement. These data also showed that extending the demonstration beyond three weeks may not be warranted. This conclusion is consistent with food shoppers reacting favorably to the demonstration through increased purchases that lasted several weeks.

Table 2 presents the OLS results. Forty-six percent of the variation in weekly item movement per thousand customers was explained by the equation, and the F value was significant. As expected, PRICE had a negative relationship with item movement per thousand customers. TEST had a positive impact on sales. Both higher and lower income supermarkets vis-a-vis the control store had larger sales of shoulder and top blade steaks. The background of the demonstrator (NUTR) did not affect item movement. PRICETEST had a negative coefficient, reflecting the interaction of lowering the price during the demonstration period. To determine if the specific stores had an effect on the estimates, a set of dummy variables was constructed and included in a separate regression. None of these coefficients was significant, and those of the other variables were comparable to the ones in Table 2. This relationship suggested that the results were not store specific.

The partial sum of squares are shown in Table 3. Sequentially adding variables in the order shown in the table indicated that allowing for the nutritional background of the demonstrator, given that PRICE,INCOME, and the constant were already included, did not have a significant effect on the explained sum of squares. However, adding TEST and PRICETEST sequentially did have significant effects. The Type III sum of squares indicated that PRICE, TEST, and PRICETEST had significant impacts given that all other variables were included in the model. Neither INCOME nor NUTR had significant Type III contributions. These results provide further evidence that the background of the demonstrator and the income level of the area in which the store is located did not have significant effects on item

Table 3

Shoulder and Top Blade Steak Partial Sum of Squares:
Item Movement per Week per Thousand Customers

	Type I		Type III	
Variable	Sum Squares	F Value	Sum Squares	F Value
PRICE	.0001167*	68.42	.0000856*	50.17
INCOME	.0000174*	5.09	.0000002	.15
NUTR	.0000002	.12	.0000003	.18
TEST	.0001644*	96.34	.0000722*	42.33
PRICETEST	.0000385*	22.56	.0000385*	22.56

* Significant at the .05 level.

Table 4

Estimated Demonstration Effects per 25,000 Customers per Week*

	Estimated Level of Item Movement
Predicted sales	
PRICE=$2.89, no demonstration, higher income store	16 packages
PRICE=$1.89, demonstration, lower income store	186 packages
PRICE=$1.89, demonstration, higher income store	199 packages
Incremental effect for higher income store	
P = $2.89 and add a demonstration	58 packages
No demonstration and lower P to $1.89	33 packages
P=$1.89 and add a demonstration	150 packages
Change P from $2.89 to $1.89 and add a demonstration	183 packages

* based on Table 2.

movement. Rather, price and the presence of the demonstration had the predominant impacts.

Further insights can be gained by converting the estimates into per store per week values. A 25,000 customer count store was chosen because it is a level of patronage associated with moderately sized supermarkets in metropolitan areas. Other assumed values reflect conditions at the start of the test period. Table 4 contains the calculations. Predicted sales refer to the average weekly item movement for 25,000 customers under the noted conditions. If there is no test, the price is $2.89 per pound, and it is a higher income store, weekly supermarket sales would average 16 packages per week. Reducing the price to $1.89 per pound and conducting the demonstration would increase item movement to 199 packages per week. A lower income store having comparable numbers of food shoppers is estimated to sell 13 fewer packages per week, on average. These results show the test had a very positive impact at the individual store level with a good flow of customers.

Table 4 provides some other useful information. It breaks down the estimated increase in item movement per 25,000 customer count store that can be attributed to the components of the demonstration. Price was lowered from $2.89 to $1.89 per pound during the test. Thus, there is an estimated price effect of $1.00 that is estimated to have increased item movement by 33 packages per 25,000 food shoppers.

The functional form of the estimated equation incorporated the impact of the demonstration via its presence/absence and on the price level via the interaction term. Consequently, if the price had remained at $2.89, the predicted sales increase was 58 packages. Lowering the price to $1.89 in the absence of the demonstration was estimated to generate an additional 33 packages sold. The introduction of the demonstration, given that the price was $1.89, generated an estimated incremental sales effect of 150 packages. The overall impact of lowering the price by $1.00 from $2.89 and having the demonstration was an estimated sales effect of 183 packages.

These results are portrayed in Figure 2. The no demonstration demand curve, D1, is for a higher income neighborhood store, and given P=$2.89, predicted sales are 16 packages. Lowering the price from $2.89 to $1.89 increases sales from 16 to 49 packages. D2 represents the demand curve with a demonstration. A demonstration at a price of $2.89 is predicted to increase item movement to 74 packages without a demonstration and to 199 packages with a regular demonstrator.

Further insights regarding the demonstration are found in the price elasticities shown in Table 5. These pertain to the presence/absence of the demonstration at the two price levels. Because of the interaction term, the impact of the demonstration depends on the price level, as do the elasticities. At the price of $2.89 per pound, the demand is quite elastic in the absence of a demonstration, and it is estimated to fall to 1.25 at P=$1.89 and no demonstration. Given the presence of the demonstration, the respective price elasticities are lower, reflecting the interaction, and at the lower price the elasticity has become inelastic. This result is quite important, as it shows that care must be taken in lowering the price whenever a demonstration takes place. Depending on the price elasticity, lowering the price may not be warranted.

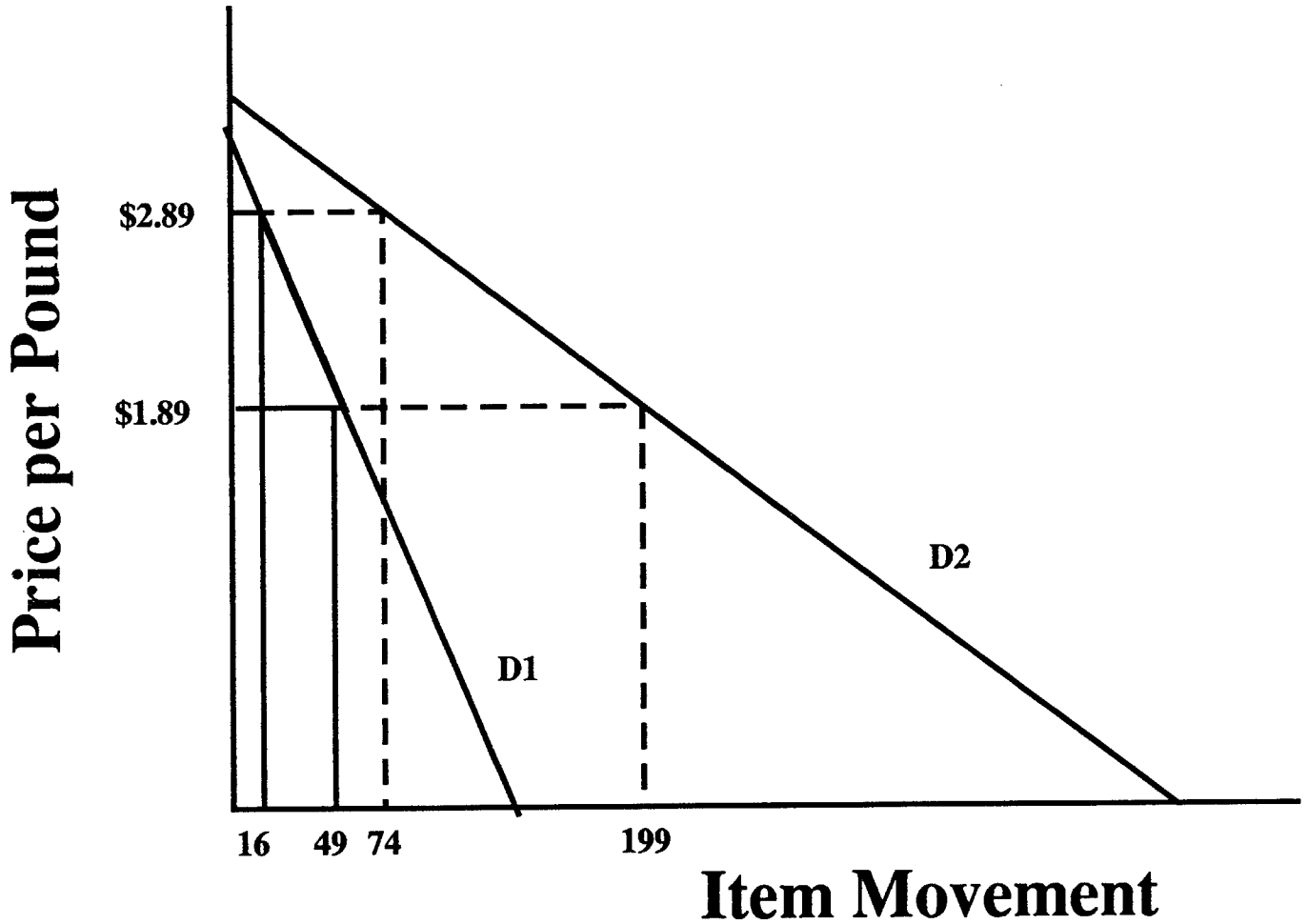
Table 5

Estimated Price Elasticities:
With and Without a Demonstration*.

Price	No Demonstration	Demonstration
2.89	5.87	3.90
1.89	1.25	.95

* Based on Table 2 for a higher income store and a regular demonstrator for 25,000 customers per week.

Figure 2. Demonstration and No Demonstration Demand Curves for Top Blade and Shoulder Steaks Per Week Per 25,000 Customers (High Income Store and Regular Demonstrator)



Marketing Implications

Several marketing suggestions follow directly from this analysis. First, visual inspection of the graphs depicting item movements over time for each store (e.g., Figure 1) indicate that if these cuts are to be promoted on the basis of price alone, the best time to do so would be just prior to the holidays of Easter, the Fourth of July, and Labor Day. The duration of a demonstration should be two or three weeks in a single store. Friday and Saturday as demonstration days resulted in significant increases in weekly item movements for top blade and shoulder steaks. A competitive price vis-a-vis other meats should be maintained. The use of price incentives during demonstration periods needs careful evaluation. The own-price elasticity of demand changes with the presence of an effective demonstration, and as in the present case, the price reduction could be large enough to generate a change from an elastic to an inelastic demand. Having the aroma and samples of the grilled steak causes a significant amount of impulse buying.

Not only do the results of this study provide information about demand responses, but the results also have implication regarding demonstration costs. First, the significance of the demonstration's impact suggest that Friday and Saturday, when patronage is high, are good demonstration days. Second, there is no need to go to the extra expense of hiring demonstrators with nutrition/ dietary backgrounds. Third, the demonstration period should be relatively short for frequently purchased foods such as top blade and shoulder steak. After two to three weeks most food shoppers who are going to purchase as a result of the demonstration have done so.

References

Eastwood, D. B. *The Economics of Consumer Behavior*. Newton, MA: Allyn and Bacon, 1985.

Eastwood, D. B., M. D. Gray, and J. R. Brooker. "Using Scan Data to Evaluate Advertising: A Suggested Methodology and Preliminary Results." Paper presented at the Annual Meeting of the Southern Agricultural Economics Association, 1990.

Jensen, H. and J. Schroeter. "Estimating Retail Beef Demand Using Household Panel Scanner Data." Paper presented at the Annual Meeting of the American Agricultural Economics Association, 1989.

Partch, K. D. Litwak, and J. T. Cepeda. "Taking the Measure of Fresh Meat," *Supermarket Business*, August, 1990.

Ward, R. *Economic Impact of the Beef Checkoff Program*. University of Florida, 1990.