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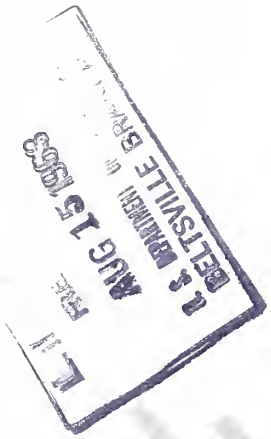

SPECIAL PROMOTIONAL PROGRAMS FOR WINTER PEARS

Their Effects on Sales of Winter Pears and Other Fruits

U. S. DEPARTMENT OF AGRICULTURE
MARKETING ECONOMICS DIVISION
ECONOMIC RESEARCH SERVICE
MARKETING RESEARCH REPORT NO. 611

PREFACE

This study evaluates the relative sales effectiveness of four different promotional techniques as used by an agricultural promotion organization. The comparative effectiveness of the techniques is determined in terms of the estimated sales gain per dollar spent for each. Also examined is the nature and extent of retailer support for these techniques and the individual and joint contribution to sales of pears of such retail merchandising practices as prices, display space, and newspaper advertisement space.

This study is part of a broad program of research designed to help maintain and expand markets for farm products. It is one of a group of studies conducted to provide information that will help agricultural producer groups develop and administer effective and economical promotional programs. It is noteworthy because it deals with a problem of wide interest in agriculture, namely, how to allocate promotional funds when sales of the product are relatively low and the promotional budget is limited.

The Oregon-Washington-California Pear Bureau cooperated in this research by defraying a substantial part of the cost of collecting the data, arranging for and supervising promotional activities, and bearing all expenses incurred from these activities. Officials of cooperating retail food organizations and produce department managers of participating stores took an active part in conducting the study.

The research was conducted by the Market Development Branch under the general direction of Peter L. Henderson. Sidney E. Brown aided in planning and coordinating the initial phases of the field activities. Computations for the study were performed by the Statistical Unit of the Market Development Branch.

Related reports on the evaluation of promotional activities by agricultural producer groups include:

Special Promotional Programs for Apples: Their Effects on Sales of Apples and Other Fruit. Mktg. Res. Rpt. 446. Jan. 1961.

Effectiveness of a Special Promotional Campaign for Frozen Concentrated Orange Juice. Mktg. Res. Rpt. 457. Mar. 1961.

Promotional Programs for Lamb and Their Effects on Sales. Mktg. Res. Rpt. 522. Jan. 1962.

Proceedings of National Workshop on Promotion of Farm Products. ERS-58. Apr. 1962.

These reports can be obtained on request from the Division of Information, Office of Management Services, U. S. Department of Agriculture, Washington 25, D. C.

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July 1963

SUMMARY

Cooperative research with the Oregon-Washington-California Pear Bureau was conducted in 75 food supermarkets in 5 cities over a 20-week period to evaluate the relative sales effectiveness of 4 promotional techniques for winter pears.

Techniques tested in a controlled experiment were: (1) Special point-of-purchase displays using in-store promotional materials; (2) store demonstrations in which taste samples of pears were given to customers along with recipe folders suggesting varied uses of pears; (3) dealer contests with cash prizes; and (4) a media advertising program of low intensity. Control periods of no advertising or merchandising support by the Pear Bureau were used for comparison.

Each of the promotional techniques was supported by fieldmen who arranged for retailer cooperation and solicited tie-in retailer advertising and merchandising support.

Store demonstrations and dealer contests were the most effective promotional techniques studied for selling winter pears. Based on the panel of 75 stores, sales averaged 24 percent higher per store for store demonstrations and 22 percent higher for dealer contests compared to periods of no promotion by the Pear Bureau.

Sales of winter pears in the 75 test stores, which represented 20 different retail food organizations, were projected to all non-test stores in each cooperating organization. This permitted a more realistic comparison of the relative sales effectiveness of store demonstrations and dealer contests; it also facilitated an analysis of the relationship of sales returns to promotional outlay.

The sales effects of store demonstrations were limited mainly to those stores which had the demonstrations; the sales effects of dealer contests were organization wide. Hence, when all stores of each cooperating organization were considered, dealer contests showed substantially greater increases in sales than store demonstrations. In addition, the costs of dealer contests were slightly less. Taking into account both the greater increase in sales and the lower cost, dealer contests were more than one and one-half times as effective as store demonstrations in terms of the immediate increase obtained for a dollar's worth of promotion.

The media advertising program of the low intensity employed in this study and the use of special point-of-purchase displays in retail stores did not increase sales of winter pears.

The success or failure of the promotional techniques was directly related to the retailer support given to them. During store demonstrations and dealer contests retailers devoted greater display space and newspaper advertisement space to winter pears, made greater use of Bureau promotional materials, and featured pears at a lower price than during periods of no promotion. Retailers actually devoted less display space

and newspaper advertisement space to pears during the media advertising program and special point-of-purchase displays than during no promotion, and did not reduce the price. Retailers used fewer Bureau point-of-purchase materials during the media advertising program than during any of the other techniques tested.

The individual effects of retail price, display space, and newspaper advertisement space on sales of winter pears were negligible. However, when reduced price, increased display space, and increased newspaper advertising space were used together, sales were significantly increased.

SPECIAL PROMOTIONAL PROGRAMS FOR WINTER PEARS

Their Effects on Sales of Winter Pears and Other Fruits

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INTRODUCTION

The Oregon-Washington-California Pear Bureau was organized to explore the potential for greater domestic distribution and consumption of winter pears (Anjou, Bosc, and Comice varieties). Founded in 1931 on a voluntary membership basis, the Bureau represents some 3,000 winter pear growers, or approximately 90 percent of all growers in the three Pacific Coast States. This three-State area, Oregon, Washington, and California, accounts for over 90 percent of the winter pears grown in the United States.

The purpose of the Pear Bureau is to unite winter pear growers in a self-help effort to increase their returns and expand sales through improved marketing efficiency. Funds for operating the Bureau are obtained through voluntary assessment of its members on the basis of numbers of boxes produced.

Since its founding, the Bureau has conducted promotional and advertising programs in selected metropolitan areas throughout the United States. The overall objective of these programs is to stimulate the demand for winter pears.

The Bureau's promotional program is directed toward both the consumer and the retail trade. It is designed to educate the consumer on how ripe pears look and taste, and the use and health characteristics of winter pears. Equally important, it is aimed at establishing proper pear ripening and merchandising practices among the wholesale and retail trades.

Winter pears do not ripen on trees, nor to any appreciable extent in cold storage; they require special ripening treatment. Also, color is not a reliable guide to ripeness; e.g., a mature, ripe, and ready-to-eat Anjou pear is light green. Thus, there is ever present the problem of teaching scientific ripening programs and proper merchandising of winter pears to the trades as well as educating the consumer.

The Bureau employs a combination of advertising and merchandising activities. Media advertising is used to create greater consumer awareness of winter pears. A primary part of the Bureau's promotion program has been retail store demonstrations. Demonstrators pass out taste samples of ripe pears and recipe folders to customers in retail stores, stressing the physical appearance of ripe pears, their nutritive value, and varied uses. The purpose of retail store demonstrations is twofold: to acquaint consumers with the product, and also to show the retailer how winter pears sell when properly ripened and merchandised.

These activities are supported by fieldmen in the principal pear markets. Fieldmen coordinate the timing of Bureau promotions with local supplies and seasonal demand. They make personal visits to retailers, encouraging them to support the Bureau's promotional program through tie-in advertising and larger and better pear displays. They distribute merchandising kits containing reference material such as the Bureau's promotion plans, radio scripts and newspaper advertising mats, and merchandising suggestions like selling phrases and display ideas. The fieldmen distribute recipe folders and other point-of-purchase materials to retail food organizations and demonstrate the use of these materials in special displays. They provide food editors of newspapers and radio with publicity copy and photographs which describe and illustrate a variety of pear dishes.

Upon request, trained fieldmen help wholesalers and retailers plan a ripening program for winter pears. They help plan the storage area and distribution programs for individual stores and train warehouse personnel in the use of pressure testers for determining when pears are ripe or "ready to eat."

Supplementing the media advertising program, the retail store demonstrations, and the personal contact work of the fieldmen is the Bureau's home economics department (its trade name is Pacific Kitchen). This department, operated by a full-time home economist and dietician develops new uses and recipes for winter pears. Periodically, during a marketing season, the department mails editorial materials to food editors of 200 different metropolitan newspapers. These materials include mats for reproduction of pear recipes and glossy photographs of pear dishes. In addition, the home economics department mails a four-page folder called "Pear-A-Graphs" to 4,500 food editors and home economists throughout the country. This folder contains photographs which may be ordered in mat form for reproduction, complete recipes, and stories on consumer education in the use of winter pears.

The cost of producing winter pears is increasing, but net returns to growers have remained fairly constant. Growers are unwilling to pay higher assessments to the Bureau for promotion without some assurance that increased sales will result. The assessment rate which determines the promotional budget has prevailed since 1955 and will probably not be increased for some time. With promotion costs constantly increasing, the Pear Bureau cannot easily have an effective promotion program with funds which now buy only a part of what they bought in 1955. Thus, the immediate problem facing the Pear Bureau is not how much to spend on promotion, but where to spend the available promotional funds most effectively and economically. The U. S. Department of Agriculture and the Oregon-Washington-California Pear Bureau made this study to develop information which would be helpful in solving the problem of fund allocation.

On the basis of promotional techniques used with success by the Bureau in past years, and techniques that other commodity groups have used with apparent success, and from recommendations of Pear Bureau officers and members, four different promotional techniques were selected for testing.

Research was undertaken to determine:

1. The sales effectiveness of these promotional techniques compared to each other and to no promotion.

2. The nature and extent of retailer support for the promotional techniques.

3. The influence of various retail merchandising practices (prices, displays, and newspaper advertising space) for winter pears and other selected fruits on sales of winter pears.

4. The influence of promotional techniques for winter pears on sales of apples, oranges, and bananas, individually and in total.

PROCEDURE AND ANALYSIS

Treatments and Experimental Design

A controlled experiment was used to test the comparative sales effectiveness of the four promotional techniques. Techniques (experimental treatments) tested were: (A) special point-of-purchase displays; (B) store demonstrations; (C) dealer contests; and (D) a media advertising program. A control treatment of no advertising and promotion (E) was used as a basis for comparison. The Pear Bureau suspended its usual promotion during this period but retailers were free to use any Bureau materials that had been distributed earlier.

The four promotional techniques and the control treatment (no promotion) were assigned at random to 5 cities and 5 time periods (table 1). Each treatment was used once in each city and each time period. This balanced arrangement of cities, time periods, and treatments, called a latin square experimental design, equalized the differences in sales associated with cities and seasonality. Thus, effects of the treatments could be isolated and more precise estimates obtained of the effectiveness of each promotional technique.

A detailed description of each promotional technique follows:

A. Special point-of-purchase displays.--Fieldmen visited produce merchandisers, produce supervisors, and produce managers, attempting to get maximum use of Bureau point-of-purchase materials. Fieldmen actually put up these materials and built special mass displays in test stores when retailers asked them to do so (fig. 1).

The color point-of-purchase materials consisted of illustrations (clusters and bin strips) showing the three winter pear varieties, Anjou, Bosc, and Comice, with copy promoting their taste appeal; and posters and over-the-wire banners depicting the various uses of pears as in salads, pies, snacks, and with complementary products like cheese and meat.

Table 1.--Latin square experimental design used in pear promotion study, 75 supermarkets in 5 U.S. cities, five 4-week periods between November 20, 1961, and April 21, 1962

Time	Cleveland, Ohio	Baltimore, Md.	Milwaukee, Wis.	Houston, Tex.	Atlanta, Ga.
November 20 through December 16, 1961	(A) Special point-of-purchase displays	(E)	(D)	(B)	(C)
Holiday season omitted					
January 2 through January 27, 1962	(B) Store demonstrations	(C)	(E)	(A)	(D)
January 29 through February 24, 1962	(E) No sponsored promotion by Pear Bureau (control or base)	(B)	(C)	(D)	(A)
February 26 through March 24, 1962	(D) Media advertising	(A)	(B)	(C)	(E)
March 26 through April 21, 1962	(C) Dealer contests	(D)	(A)	(E)	(B)

BN-19460

Figure 1.--Special point-of-purchase display for winter pears.

B. Store demonstrations.--Local women experienced in demonstrating food products were hired by the Bureau to pass out test samples of ripened winter pears to customers in retail stores (fig. 2). Using a slicer which cored the pear and cut it in neat wedges, they suggested varied uses of pears, such as salads, desserts, and out-of-hand eating. They distributed recipe folders describing the preparation of several plain and fancy pear dishes.

During periods when this technique was tested cooperating retailers were required to (1) stock an adequate supply of good quality, ripened winter pears; (2) build large and attractive displays of pears and continue the displays at least one week after the demonstration; and (3) offer the pears at a reduced but reasonable price in accordance with local supply and competitive conditions. Under normal supply and competitive conditions, the maximum price acceptable to the Bureau was 2 pounds for $0.39.

Bureau fieldmen arranged for and supervised the conduct of the demonstrations. Demonstrations were held on Fridays and Saturdays when retailers featured "advertised specials" and customer traffic was heaviest. They were conducted in only one test store of each organization represented in the sample. For example, in Milwaukee, the panel of 15 test stores represented 4 retail food organizations; thus, there were 4 demonstrations, or one in a test store belonging to each organization. In addition, three or four demonstrations were conducted in the non-test stores of each organization. This procedure followed the operating policy of the Bureau in having only

BN-19454

Figure 2.--Demonstrator passing out pear wedges to a customer.

a limited number of demonstrations in a retail organization. It is hoped that demonstrations in a few stores will obtain organization-wide support in terms of a favorable price, mass displays, and tie-in advertising.

C. Dealer contests.-- The Pear Bureau sponsored contests and offered cash prizes to produce managers of retail stores. Separate contests were conducted among stores within each cooperating retail food organization. The Bureau offered $150 in prize money to each organization that participated in a contest. Officials of the organization conducted the contest among their respective stores and determined the winners. The local Bureau fieldmen presented the winners with cash awards.

A form letter which the Bureau sent to retail organizations, describing the cash prizes and criteria for determining the winners, is reproduced in the appendix to this report.

D. Media advertising program.--The media employed for advertising consisted of metropolitan newspapers and local radio. Newspaper ads were 2 columns by 5 inches, or 140 lines, and in black and white. Several 30-second spot announcements were used on the major radio stations in the area.

The number of media facilities used, the frequency of advertising, and the costs are shown for each city in table 2.

Table 2.--Media advertising program of Oregon-Washington-California Pear Bureau during pear promotion study, five 4-week test periods between November 20, 1961, and April 21, 1962

City	Newspaper advertising				Radio advertising		Cost of advertising
	Metropolitan newspapers used	Number of ads	Size of each ad	Total lines	Radio stations used	Number of 30-second spots	
	Number	Number	Lines	Lines	Number	Number	Dollars
Cleveland	2	6	140	840	2	27	1,282
Baltimore	2	6	140	840	2	28	1,285
Milwaukee	1	1/ 2	140	280	2	48	793
Houston	2	6	140	840	2	24	1,014
Atlanta	1	3	140	420	2	32	902
Total (5 cities)	8	23	---	3,220	10	159	5,276

1/ Three ads were scheduled in Milwaukee, but due to a newspaper strike, only two were published.

The media advertising emphasized the health (energy builder) and use (packed in lunch boxes, salads, desserts, etc.) characteristics of winter pears, and out-of-hand eating qualities such as their juiciness and natural sweetness. The radio advertisements also named local retail food organizations which regularly sold winter pears.

Newspapers carried the advertisements on Thursdays; radio stations used the spot announcements on Wednesdays, Thursdays, and Fridays, during the daylight hours to reach the greatest accumulative audience. During the program, fieldmen told wholesalers and retailers about the Bureau's newspaper and radio advertising.

The media advertising as described above was similar to the Pear Bureau's regular promotion program as developed in past years.

Related activities.--In each of these promotional efforts, fieldmen encouraged retail groups to cooperate and support the promotion by giving winter pears more display space and a better location in the produce department, by offering pears at a featured price, and by including pears in their weekly newspaper food advertisements.

In addition, the field staff carried on the usual work of showing wholesalers and retailers how to preripen or condition pears before offering them for sale.

Home economics activities of the Bureau, consisting mainly of direct mailings of winter pear publicity materials to food editors, were carried on throughout the study and were essentially the same in all cities during each test period.

Sample and Controls

The 4-week test periods gave the Pear Bureau enough time to intensify and to repeat their promotional efforts and also to contact and to solicit the support of retailers. Retailers also had time to plan their promotion of other produce items to tie in with Bureau advertising.

The study was conducted from November 20, 1961, to April 21, 1962 (see table 1). This is considered the normal marketing season for winter pears. The last 2 weeks in December were omitted because consumers always buy more fresh fruit during the Christmas holidays than at other times.

Five cities having a minimum population of 1 million each were selected for the test. They represented the major economic characteristics in those geographic regions where most of the principal pear markets are located. The cities were Cleveland, Ohio; Baltimore, Md.; Milwaukee, Wis.; Atlanta, Ga.; and Houston, Tex. These cities were established winter pear markets of high, medium, and low consumption, and were representative of markets covered by the Bureau's regular promotion program. There was little or no overlapping of media advertising from neighboring cities.

In each city, a representative panel of 15 food supermarkets was selected from the leading retail organizations. Officials of cooperating organizations, the local Bureau fieldman, and a representative of the U.S. Department of Agriculture selected the stores on the basis of size and type of ownership (corporate, cooperative, voluntary chains, and independents); quantity of past winter pear volume (high, medium, and low); and geographical location to represent the various income and ethnic groups. The number of test stores selected from each organization was based on the percentage share of retail food sales accounted for by the organization in the market as determined by local newspaper surveys.

Collections of Data

The standard audit method was used to determine weekly sales of winter pears for each store. 1/ The same method was employed to determine sales of apples, oranges, and bananas during a 4-week test period. Merchandising practices employed by panel stores were observed during the latter part of each week when weekend "specials" were featured and when greatest sales occurred. The observations included price, amount of display area, and amount of newspaper advertising space of each fruit studied; and the nature and extent of use of Pear Bureau point-of-purchase materials in special displays. In addition, weekly total store sales and produce department sales in dollars were reported by each store during the period under study.

Methodology

A detailed discussion of the analytical methods used in the study is given in the appendix.

FINDINGS

Effects on Sales of Winter Pears

Average sales per store per week during each of the promotional techniques and during no promotion are shown in table 3.

Store demonstrations and dealer contests were both effective in increasing sales of winter pears over no promotion. Sales averaged 24 percent higher for store demonstrations and 22 percent higher for dealer contests than when there was no sponsored promotional activity by the Pear Bureau. In contrast, the media advertising program and the use of special point-of-purchase displays in retail stores were both ineffective in stimulating sales of winter pears.

In comparing the sales differences between the promotional techniques and no promotion, it was assumed that differences in prices and merchandising practices employed by the stores during each treatment were associated with the presence or absence of promotion for pears and were part of the technique.

1/ Standard audit method: (beginning inventory + weekly receipts) - (ending inventory + transfers + withdrawals + spoilage) = sales.

Table 3.--Sales of winter pears during pear promotional techniques and no promotion, 75 supermarkets in 5 U.S. cities, five 4-week test periods between November 20, 1961, and April 21, 1962

Technique	Average sales per store per week 1/	Change from no promotion	
	Pounds	Pounds	Percent
Store demonstrations	323	2/ 63	24.2
Dealer contests	317	2/ 57	21.9
Media advertising	225	3/-35	-13.5
Special point-of-purchase displays	227	3/-33	-12.7
No promotion (base)	260	---	---

1/ Anjou, Bosc, and Comice pears.
2/ Statistically significant at the 5 percent probability level.
3/ Not statistically significant; that is, the difference could have occurred by chance.

Statistical analysis of the sales data, with adjustments for differences in the five cities and seasonality in demand, showed that the sales increases were statistically significant at the .05 probability level (table 3). In simplest terms, this means that the odds of obtaining such sales increases from chance fluctuations in sales and non-compensating errors of measurement were less than 5 in 100. Stated more positively, the odds are 19 to 1 that the sales increases during store demonstrations and dealer contests were due to these particular promotional activities and not the result of chance.

The lower sales observed for media advertising and the special display technique compared to no promotion were not of sufficient magnitude to be considered statistically significant; that is, these sales differences could have occurred as a result of chance. It cannot be inferred that the media advertising program and the special displays adversely affected sales. The results show only that the Pear Bureau's media advertising and special point-of-purchase displays in retail stores did nothing to stimulate sales.

For a higher volume product, sales might be more responsive to the kinds of media advertising and special point-of-purchase displays sponsored by the Bureau. However, the results of this study show that sales of winter pears, a low volume item, were not influenced significantly by media advertising of this intensity or by special displays.

Relationships between sales during the promotion and sales without promotion were similar in the five cities, with one exception. Store demonstrations increased sales in four of the cities but not in the fifth one; dealer contests increased sales in all of the five test cities. Sales were lower during advertising and special displays than during no promotion in each of the test cities (fig. 3).

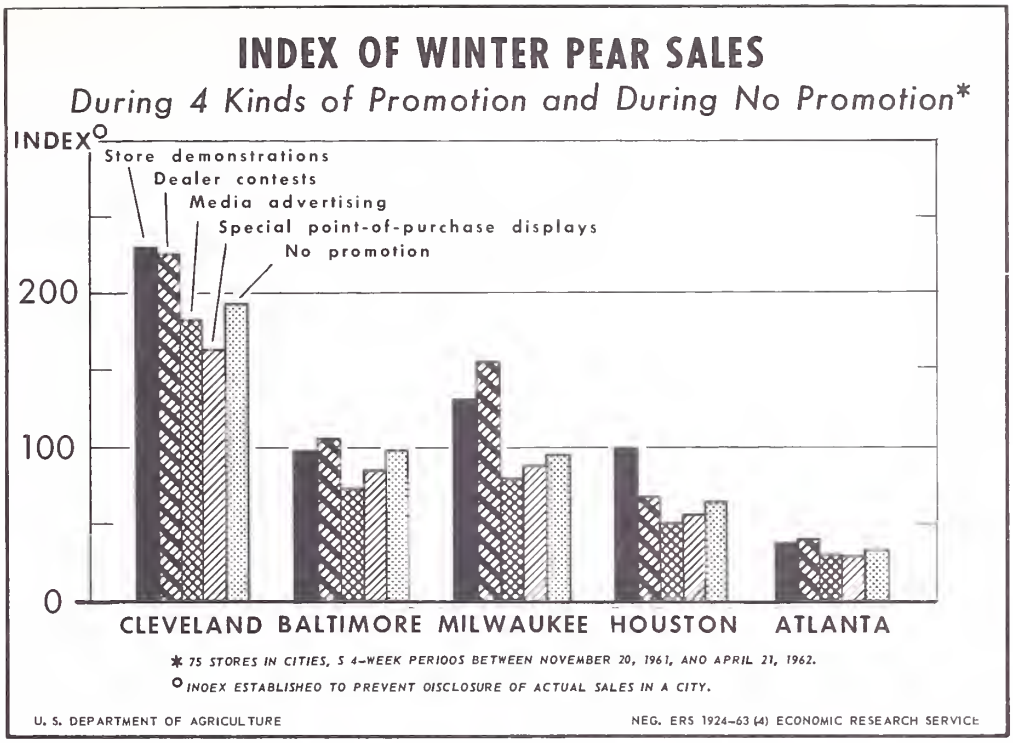

Figure 3.

Retailer Support for the Promotional Techniques

Differences in sales are apparently related to differences in retailer support given to the particular types of promotional activities. Retailers featured lower prices and more display area and newspaper advertisement space for winter pears during store demonstrations and dealer contests than during periods of no promotion (table 4). In contrast, retailers actually gave the pears less display space and newspaper advertisement space during the media advertising and special display techniques than they did during comparable periods of no promotional activity by the Pear Bureau. There was only a small difference in retail price of winter pears between each of these techniques and no promotion.

As can be seen in table 5, retailers used more Pear Bureau point-of-purchase materials during store demonstrations and dealer contests than during no promotion. 2/ As would be expected, more of these point-of-purchase materials were used when the fieldmen personally distributed the materials and put them up.

All of these retail merchandising factors (price, display space, newspaper advertisement space, and use of point-of-purchase materials) acting

2/ Types of point-of-purchase materials and total number of pieces used in each city are shown in appendix, table 14.

Table 4.--Retail price, display space, and newspaper advertising linage for winter pears during promotion test, 75 supermarkets in 5 U.S. cities, five 4-week test periods between November 20, 1961, and April 21, 1962 1/

Merchandising factor and test item	Weekly average per store	Change from no promotion
	Cents/pound	Percent
Price: 2/		
Store demonstrations	22.1	-6.0
Dealer contests	21.9	-6.8
Media advertising	24.2	+3.0
Special point-of-purchase displays	23.9	+1.7
No promotion (base)	23.5	---
	Square feet	Percent
Display space:		
Store demonstrations	10.4	+16.9
Dealer contests	10.0	+12.4
Media advertising	7.5	-15.7
Special point-of-purchase displays	8.0	-10.1
No promotion (base)	8.9	---
	Lines	Percent
Newspaper advertising: 3/		
Store demonstrations	27.0	+83.7
Dealer contests	27.0	+83.7
Media advertising	11.4	-22.4
Special point-of-purchase displays	1.6	-89.1
No promotion (base)	14.7	---

1/ Anjou, Bosc, and Comice pears.

2/ Weekly prices observed for each variety of winter pears were weighted in relation to respective store sales volume.

3/ Newspaper advertising space for each cooperating retail food firm was weighted by number of sample stores representing that firm.

Table 5.--Observed use of Pear Bureau point-of-purchase materials by retailers during pear promotion test, 75 supermarkets in 5 U. S. cities, five 4-week test periods between November 20, 1961, and April 21, 1962

Test item	Pieces of material used in all stores 1/	Change from no promotion
	Number	Percent
Store demonstrations	793	+285
Dealer contests	521	+153
Media advertising	345	+67
Special point-of-purchase displays	1,152	+459
No promotion (base)	206	--
Total	3,017	---

1/ Includes only point-of-purchase materials promoting winter pear varieties, Anjou, Bosc, and Comice.

together, rather than any one factor acting separately, resulted in increased sales during store demonstrations and dealer contests. Conversely, because some of the supporting factors were absent during the media advertising program and the special displays, sales did not increase. Even store demonstrations and dealer contests must have the complete support of the retailer in terms of a favorable price, greater display space, greater newspaper advertisement space, and greater use of point-of-purchase materials to be of utmost effectiveness. For example, in Baltimore, sales during store demonstrations and during no promotion were about the same (fig. 3). Retailers in this city allocated more display space to pears during store demonstrations, but less newspaper advertisement space than during no promotion, with little or no difference in price and the amount of point-of-purchase materials used. Thus, these retail merchandising factors acting independently or in different directions resulted in no appreciable increase in sales for store demonstrations in this city.

This conclusion is further substantiated by a statistical measurement of the individual and joint effects of price, display space, and newspaper advertisement space for winter pears on sales of pears. 3/ Total store sales (dollars) were used as variable in the analysis to reflect the effects of customer traffic and customer buying power.

After adjustments for city and seasonal differences, indexes of change in winter pear sales associated with the individual effects of price, display space, and newspaper advertisement space were not large enough to be important (table 6). Similarly, the independent effects of customer traffic and buying power on sales of pears was not important. Stated a different way, the number of customers passing winter pear displays in retail stores did not affect sales of winter pears when there was no change in price, display space, and newspaper advertisement space for the product.

Likewise, only a small percentage of total variation in sales was explained by each of the retail merchandising practices and total store sales (index of customer traffic and buying power) acting separately (denoted by R^2 in table 6).

While no index of absolute change in sales could be associated with the joint effects of these factors, the percentage of the total variations in sales explained by these factors acting together was determined. Jointly, these factors explained 35 percent of the total variations in sales. This was 88 times the percentage explained by price acting separately, 10 times that explained by newspaper advertisement space, and more than 3 times that explained by display space. Clearly then, it is these factors acting together which have the greatest effect on sales of winter pears.

3/ See appendix for a discussion of the statistical methods used to obtain these measurements.

Table 6.--Changes in sales of winter pears associated with changes in merchandising and promotional factors during pear promotion test, 75 supermarkets in 5 U.S. cities, five 4-week test periods between November 29, 1961, and April 21, 1962

Factor	Unit	Weekly average per store	Change in winter pear sales associated with a unit change in factor (index or b value) 1/		Percentage of total variations in sales explained by observed variations in each factor (R^2)
			Pounds	Percent	Percent
Total store sales	Dol.	3,826	2/	2/	10.4
Display space for winter pears	Sq. ft.	9.0	+1.7	+.6	10.3
Newspaper advertisement space for winter pears	Lines	16.2	+.7	+.3	3.5
Price of winter pears 3/	Ct./lb.	23.1	-.5	-.2	.4
Combined effects of above factors	---	---	---	---	35.1
Total	---	---	---	---	59.7
Other factors and experimental error 4/	---	---	---	---	40.3
Total	---	---	---	---	100.0

1/ A plus sign indicates that a positive change (increase) in the value of the factor is accompanied by an increase in sales, and a negative change by a decrease in sales. For example, on the average an increase of 1 square foot in display space was accompanied by an increase of only 1.7 pounds (.6 percent) in sales.

A negative sign signifies that a positive change in the factor results in a decrease in pear sales and a negative change (decrease) in the factor results in an increase in pear sales. Thus, on the average, an increase of 1 cent a pound in price of winter pears resulted in a decrease of only .5 pound (about .2 percent) in sales.

2/ Less than .05.

3/ Weekly prices observed for each variety of winter pears were weighted in relation to sales volume of each store.

4/ Nonquantitative variables such as quality, variety, and size of winter pears.

Obviously, with a change in these merchandising practices, price, display space, and newspaper advertisement space, the effect of customer traffic on sales is more substantial.

Sales Returns Versus Costs of Promotion Techniques

Since sales did not rise during the media advertising program and the special displays, sales returns were not related to costs of these two techniques. Demonstrations were conducted in only one test store of each organization participating in the study. Dealer contests, however, were conducted in all stores of a participating organization. To compare the relative effectiveness of the techniques, sales during no promotion, store demonstrations, and dealer contests for the test stores in each organization were projected to all stores in the organization. 4/ This further facilitated an analysis of the relationship of sales returns to promotional outlay for each technique.

The analysis showed that, per dollar expended, dealer contests were one and one-half times as effective as store demonstrations in obtaining immediate sales increases over no promotion (table 7). The contests were less expensive to conduct and they brought larger sales increases than the demonstrations.

Table 7.--Cost of 2 kinds of winter pear promotion and estimated increase in quantity of pears sold during promotion, 498 food supermarkets in 5 cities, five 4-week test periods between November 20, 1961, and April 21, 1962 1/

Test item	Total cost 2/	Increase in quantity sold	
		Total	Per dollar spent on promotion
	Dollars	Pounds	Pounds
Store demonstrations	3,979	83,872	21.1
Dealer contests	3,621	116,835	32.3
Total	7,600	200,707	26.4

1/ See appendix for discussion of methods used for estimating sales and computations of costs of implementing each technique.

2/ Costs incurred by the Pear Bureau in conducting demonstrations, prize money awarded in dealer contests, and production costs of point-of-purchase materials; also salaries and traveling expenses of fieldmen.

4/ See appendix for a discussion of the computational methods used in this analysis.

The effects of store demonstrations on sales were limited mainly to stores which had the demonstrations (see following section), while the sales effects of dealer contests were organization-wide. Thus, when all stores of a cooperating organization were considered, dealer contests showed substantially greater sales increases than store demonstrations.

While the direct costs associated with the demonstrations were less than half the cost of dealer contests, the operating expenses (salaries, per diem, etc.) of the fieldmen during store demonstrations were almost double (table 8). The operating expenses were higher because fieldmen had to spend almost twice as much time in arranging for and supervising demonstrations as in presenting the contest idea to retailers and awarding prizes.

Sales in Panel Stores with Demonstrations and in Stores without Demonstrations

Because of the high cost of a store demonstration (around $50 per day), the pear Bureau follows the policy of placing demonstrations in only a few stores of a retail organization; but the Bureau solicits organization-wide support for the promotion in terms of a favorable price, greater display space, and tie-in advertising. The Bureau also requests that the mass display of pears used in the demonstrations remain the following week to give customers ample opportunity to make repeat purchases after becoming better acquainted with winter pears.

To better assess the effectiveness of the Bureau's policy regarding demonstrations, sales of winter pears were tabulated separately for stores in the panel which had demonstrations and for those which did not have demonstrations. The retail organizations represented were the same in each classification. Sales were considered during the week of the demonstration and the week following. Average weekly sales per store during no promotion were used for comparison.

Demonstration stores.--Sales of winter pears during demonstration weeks in stores having demonstrations were more than two and one-half times greater than during no promotion (table 9). The relationship of sales and retailer merchandising support during the demonstrations was the same as reported when all stores were considered together; that is, sales increases were accompanied by lower prices, greater display space, greater newspaper advertisement space, and greater use of Bureau point-of-purchase materials (table 10).

During the week following the demonstration, display space remained greater than during no promotion. Prices of the pears were a little higher than in the demonstration week, and newspaper advertisement space dropped.

Even though retailers kept their pear displays larger in the week following demonstrations, sales declined to about what they had been during

Table 8.--Fieldmen's time, total promotional costs, and operating expenses of fieldmen during store demonstrations and dealer contests, winter pear promotion study, 5 U.S. cities, five 4-week test periods between November 20, 1961, and April 21, 1962 1/

Test item	Days fieldmen spent servicing stores	Promotional costs			Operating expenses of fieldmen			Total promotional costs and operating expenses
		Pears, demonstrator salary, and prizes	Point-of-purchase material	Total	Salaries	Expenses	Total	
	Days	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Store demonstrations	56	913.45	334.03	1,247.48	1,499.12	1,232.00	2,731.12	3,978.60
Dealer contests and prizes	29	2,025.00	182.13	2,207.13	776.33	638.00	1,414.33	3,621.46
Total	85	2,938.45	516.16	3,454.61	2,275.45	1,870.00	4,145.45	7,600.06

1/ See appendix for a discussion on the computation of these costs and expenses.

Table 9.--Sales of winter pears in panel stores with and without demonstrations, during demonstration week, week following, and no promotion, 68 supermarkets in 5 U.S. cities, test periods between November 20, 1961, and April 21, 1962 1/

Classification of panel stores	Number of stores	Average sales per store during--		
		No promotion (average per week) 2/	Week of demonstration	Week following demonstration
	Stores	Pounds	Pounds	Pounds
Stores with demonstrations	20	299	785	292
Stores without demonstrations 3/	48	232	268	233

1/ Anjou, Bosc, and Comice pears.
2/ Control periods of no promotion were 4 weeks long.
3/ Includes only stores from organizations which had a store in which a demonstration was held.

Table 10.--Retail price, display space, and newspaper advertising linage for winter pears: Panel stores with and without demonstrations, during demstration week, week following, and no promotion, 68 stores in 5 U.S. cities, test periods between November 20, 1961, and April 21, 1962

Merchandising factor and classification	Number of stores	Average per store during--No promotion (average per week) 1/	Week of demonstration	Week following demonstration
	Stores	Ct./lb.	Ct./lb.	Ct./lb.
Price:				
Stores with demonstrations	20	22.2	20.9	22.0
Stores without demonstrations 2/	48	22.9	22.4	22.4
		Sq. ft.	Sq. ft.	Sq. ft.
Display space:				
Stores with demonstrations	20	9.3	19.4	14.0
Stores without demonstrations	48	8.5	9.3	9.8
		Lines	Lines	Lines
Newspaper advertising space:				
Stores with demonstrations 3/	20	14.9	31.1	3.3
Stores without demonstrations	48	12.3	49.0	4.9
		Pcs.	Pcs.	Pcs.
Pear Bureau point-of-purchase material:				
Stores with demonstrations	20	4/	15	7
Stores without demonstrations	48	4/	2	2

1/ Control periods of no promotion were 4 weeks long.

2/ Includes only those stores of an organization which had a store in which a demonstration was held.

3/ Newspaper advertising space for each cooperating retail food firm was weighted by number of stores of each organization in the panel.

4/ On the average, less than one piece per store per week.

a week with normal retailer support. They did not drop below normal, however, as sales of other commodities sometimes do after a featured special. Thus, store demonstrations during one week did not have either a beneficial or a detrimental carryover effect on sales during the following week.

Nondemonstration stores.--The demonstrations had only slight, if any, effects on sales of pears in other stores in the same organization. In the nondemonstration stores, sales were only slightly higher during the demonstration week compared to no promotion. This was due mainly to the lack of complete merchandising support for demonstrations in nondemonstration stores of the organization. Prices and display space for pears in nondemonstration stores were nearly the same during demonstration week as during no promotion, but newspaper advertisement was greater.

Sales in these stores during the week following demonstrations were the same as in weeks of no promotion.

Effects of Pear Promotion on Sales of Other Fruits

Promotional techniques for winter pears did not have a measurable effect, statistically, on sales of apples, oranges, and bananas, individually or in total (table 11). When pears were given more display space in a store and featured at a reduced price in the retailer's weekly newspaper advertising, sales of other fruits might be affected in the specific week. But during a 4-week period in which the retailer normally featured a variety of fruits such as apples, oranges, bananas, as well as pears, sales did not vary to a significant extent.

An analysis was made to learn whether retail merchandising practices for apples, oranges, and bananas had any effect on sales of pears (table 12). Not one of the practices--price, display space, or newspaper advertising space--employed by the stores in merchandising these fruits had a perceptible effect on pear sales.

The findings from these analyses in themselves are inconclusive concerning the competitive or complementary sales relations when one of these fruits is promoted. However, the sales responses do follow the same pattern

Table 11.--Sales of apples, oranges, and bananas during pear promotion test, 75 supermarkets in 5 cities, five 4-week periods falling between November 20, 1961, and April 21, 1962

Fruit and test item	Average weekly sales per store	Change from no promotion	
	Pounds	Pounds	Percent
Apples:			
Store demonstrations	2,380	127	5.6
Dealer contests	2,277	24	1.1
Media advertising	2,129	-124	-5.5
Special point-of-purchase displays	2,226	-27	-1.2
No promotion sponsored by Pear Bureau	2,253	---	---
Oranges: 1/			
Store demonstrations	2,627	130	5.2
Dealer contests	2,696	199	8.0
Media advertising	2,472	-25	-1.0
Special point-of-purchase displays	2,593	96	3.8
No promotion sponsored by Pear Bureau	2,497	---	---
Bananas:			
Store demonstrations	2,355	-82	-3.4
Dealer contests	2,195	-242	-9.9
Media advertising	2,183	-254	-10.4
Special point-of-purchase displays	2,277	-160	-6.6
No promotion sponsored by Pear Bureau	2,437	---	---
Total (apples, oranges and bananas):			
Store demonstrations	7,361	173	2.4
Dealer contests	7,167	-21	-.3
Media advertising	6,784	-404	-5.6
Special point-of-purchase displays	7,095	-93	-1.3
No promotion sponsored by Pear Bureau	7,188	---	---

1/ Includes tangerines, tangelos, and satsumas.

Table 12.--Prices, display space, and newspaper advertisement space for specified fruits and index of total store sales, during pear promotion test, 75 supermarkets in 5 cities, five 4-week periods between November 20, 1961, and April 21, 1962

Test item and fruit	Weekly average per store during--				
	No promotion	Store demonstrations	Dealer contests	Media advertising	Special point-of-purchase displays
	Ct./lb.	Ct./lb.	Ct./lb.	Ct./lb.	Ct./lb.
Price: 1/					
Pears	23.5	22.1	21.9	24.2	23.9
Apples	18.2	18.8	18.3	18.5	18.5
Oranges	15.5	16.0	15.4	15.7	15.5
Bananas	15.1	14.9	15.5	15.6	15.4
	Sq. ft.	Sq. ft.	Sq. ft.	Sq. ft.	Sq. ft.
Display space:					
Pears	8.9	10.4	10.0	7.5	8.0
Apples	51.7	53.0	54.0	52.9	52.4
Oranges	49.8	53.5	49.2	49.0	50.9
Bananas	19.0	18.0	18.5	18.6	17.7
	Lines	Lines	Lines	Lines	Lines
Newspaper advertisement space:					
Pears	14.7	27.0	27.0	11.4	1.6
Apples	100.5	105.4	114.4	98.1	112.0
Oranges	154.5	174.9	130.8	117.7	137.3
Bananas	132.4	113.6	91.5	72.7	145.5
	Index	Index	Index	Index	Index
Index of customer traffic and purchasing power 2/	100.0	99.9	99.8	99.7	98.4

1/ Weekly prices of each variety of winter pears were weighted in relation to weekly sales volume of each store. Weekly prices of other fruits were weighted in relation to display space allocated in each store, a factor known to be highly correlated with sales of these fruits.

2/ Total store sales in dollars were used as index of customer traffic and purchasing power. Weekly average of no promotion test periods = 100.

found in previous merchandising and promotion studies. 5/ That is, slight complementary sales responses were registered for products with an elastic demand when another closely related product from the same group was promoted effectively. The consistency of these findings indicates that consumer advertising and in-store merchandising for one commodity in certain product groups probably stimulates consumers' desires to buy a product from the group, but the final decision to purchase a specific item depends on the appearance of the various products on display.

LIMITATIONS OF FINDINGS

In past years the Bureau's promotion program has consisted mainly of media advertising and store demonstrations supplemented with point-of-purchase materials in special displays. Experiences in past marketing seasons have suggested some ideas, not all of which agree with the findings of the study, about the effectiveness of these techniques. The following appraisal of the possible limitations of findings relating to these techniques should be helpful.

Only the short-run sales effects of the promotional techniques tested were considered in this study. For example, the study showed that per dollar expended, dealer contests were more effective than store demonstrations in obtaining immediate sales increases. But this does not take into account such things as good will among retailers and customers created by the techniques, or new customers gained for the product. Over a longer period, store demonstrations might or might not generate more sales through good will and new customers for pears.

Store demonstrations and dealer contests were the most effective techniques studied for selling winter pears, with sales increases of 24 and 22 percent respectively over sales with no promotion. One could thus expect these techniques to continue to be the most effective, but the exact magnitude of future sales increases cannot be predicted.

No inferences can be made about the sales effects of the two techniques when used in combination with one another.

The ineffectiveness of the Bureau's media advertising program and special point-of-purchase displays cannot be attributed in any way to inferior copy or to the particular advertising medium used. The single effects of these factors were not measured in the study.

In past years before offering media advertising and store demonstrations to retailers, the Bureau's fieldmen surveyed supply and price conditions, and actually ascertained from wholesalers and retailers in each market whether they would support a promotion. The promotion was thus coordinated with favorable supply conditions, favorable wholesale and retail prices for winter pears,

5/ U.S. Dept. Agr. Special Promotional Programs for Apples--Their Effects on Sales of Apples and Other Fruit. Mktg. Res. Rpt. 446. June 1961. Also: Promotional Programs for Lamb, and Their Effects on Sales. Mktg. Res. Rpt. 522. January 1962.

and the desire and support of the trade. The timing of the programs varied from city to city depending on the local situation.

In this study, however, the Bureau could not always offer the techniques when retailers wanted them and were most willing to support them. The periods of testing each technique were assigned by researchers prior to the study to equalize the influences of season and the different cities.

Under optimal conditions of supply and price, and with favorable retailer attitudes, the media advertising and store demonstrations might have been more successful in the past than the results of this study indicated. But the findings presented here regarding the effectiveness of all four techniques in comparison to each other and to no promotion are valid, because all were tested under similar conditions.

Also, it is likely that in the past, the media advertising program and store demonstrations receive more retailer support from certain retail food stores than the study showed. But the effectiveness of these techniques as well as the others is not based on sales from selective food stores in one city, but rather from a representative panel of 75 stores from some 20 different retail organizations in 5 cities.

IMPLICATIONS OF MAJOR FINDINGS

Winter pears have not gained wide acceptance among consumers like other fruits such as apples, oranges, and bananas. The product is in the pioneering stage of promotion. The retailer has to be convinced that he can sell pears profitably with a reasonable rate of turnover if he merchandises them properly. 6/ The majority of consumers have yet to be educated to the taste, appearance, nutritive value, and benefits to be derived from pears.

It is in the context of these premises that the implications of the major findings of this study are presented.

Store demonstrations.--The Pear Bureau requires retailers to follow certain merchandising and pricing policies when using their store demonstrations. They require: (1) An adequate supply of good quality and ripened winter pears; (2) a large, attractive, retail display at a good location in the produce section of the store; and (3) a reasonable price for the product in accordance with local supply and competitive conditions. Under supply and competitive conditions existing during the test, the maximum price acceptable to the Bureau was 2 pounds for $0.39. While the Bureau does not require that pears be advertised in the retailer's weekly newspaper advertisement, the Bureau does encourage it.

Favorable tie-in retailer merchandising and pricing policies are needed to make a promotional technique successful, particularly for winter pears.

6/ Based on survey of 11 chains, it is estimated that winter pears account for about 1.1 percent of the total tonnage sold by a store's produce department annually, and around 1.6 percent of a store's total produce department sales in dollars. See "Produce Outlook...Sales top $2.55 billion," Chain Store Age, March 1962, p. 128.

In addition to having features which guarantee retailer support for the product and consumer awareness of it, store demonstrations also educate the consumer as to how winter pears taste and look, their nutritive value and varied uses. Thus, store demonstrations as developed by the Pear Bureau can be considered a multipurpose technique. While it requires much effort on the part of the Bureau's field staff, it is highly successful under competitive conditions.

Dealer contests.--Unlike demonstrations, dealer contests require little time and effort on the part of the fieldmen. Primarily, the fieldman's responsibilities are presenting the contest idea to the retailer, suggesting possible ways of conducting the contests, and awarding prizes to winners. Of course, the fieldman stresses that the objective is to increase sales of winter pears. But he is not involved in supervising the technique or determining the winners.

The Bureau does not require retailers using dealer contests to follow specific merchandising and pricing policies. The retailer in the contest decides how to price display, and advertise his winter pears. This feature appeals greatly to him.

Dealer contests were tested only once in a 4-week period in each market during the 5-month winter pear season. It is doubtful that retailers would enter contests lasting longer than 4 consecutive weeks, or more than once or twice a season. In one city, two leading chains actually conducted their contests in 2 weeks of the 4-week test period. In the opinion of one merchandiser "4 weeks is too long to run any type of contest."

The swiftness and timeliness with which dealer contests can be conducted suggests that this technique would be a powerful promotional method to move exceptionally heavy inventories of winter pears.

Media advertising program.--The history of mass advertising media will show that, with few exceptions, a considerable amount of money was spent over a period of time to gain wide acceptance by consumers. A prime example of this is frozen concentrated orange juice. It is estimated that the Florida Citrus Commission alone spent around $2.5 million on a national advertising program for frozen orange juice during 1947-53. 7/ This expenditure is exclusive of that incurred by processors and brand advertisers which was most important during the early part of the period.

The total investment in the Bureau's media advertising program as tested in this study was $5,276. The amount spent in each test city was actually more than that spent in past seasons during a comparable period of time. The Bureau took the money which normally would have been spent for two separate promotions of 3 or 4 weeks and allocated it to one consecutive 4-week period of promotion. Even so, the amount of money expended by the Bureau was exceptionally low for the product in its present stage of acceptance.

7/ This estimate is based on promotional expenditure data obtained from the Florida Citrus Commission, Lakeland, Fla.

In view of the finding that media advertising of low intensity was not effective, the Bureau has several alternatives to consider: (1) Substantially increase the monetary investment in the advertising program; (2) use the same amount of money on an intensified program in a small number of markets, preferably where past consumption has been relatively high; and (3) abandon the program. These will be discussed in the above order.

To increase substantially the investment in the media advertising program would require either raising the present assessment rate of members of the Bureau, or reducing expenditures on other promotional activities. The latter course seems highly unwise, since store demonstrations and dealer contests were shown to be most effective.

During past years, the Bureau's program has been on a national basis and in both high and low consumption areas. This was felt necessary since the Bureau sells nationally and expects some benefit in whatever U.S. market they sell. But, with such a small budget, it might be better to saturate a small number of markets with intense advertising. Then after attaining a specified level of per capita consumption for winter pears, the investment could be lowered to a sustaining rate to see if these levels could be maintained, and the rest of the budget directed to the development of additional markets. Further research would be necessary to determine the validity of this hypothesis.

A final alternative would be to abandon the media advertising program of the Bureau completely. However, it should be pointed out that the Bureau considers their media advertising program to have a twofold objective: (1) Stimulating demand by creating greater consumer awareness of winter pears, and (2) influencing food editors of newspapers and radio to use the Pear Bureau's promotional materials. On the basis of the findings of this study, the first objective is not being accomplished. If the Bureau feels that the second objective is being accomplished, then it must decide whether or not fulfillment of this objective alone warrants continuation of the media advertising program at the present level of investment.

Special point-of-purchase materials.--The failure of fieldmen building special point-of-purchase displays to increase sales does not mean that the Bureau should completely discontinue its use of these materials; nor does it imply that use of a field staff by the Bureau is not necessary to promote winter pears.

The conclusion is that special point-of-purchase displays alone are not effective. Sales of winter pears in their present stage of promotion do not respond to these displays alone. Further, this technique is not a profitable use of fieldmen's time.

The present consumer demand for winter pears with respect to the individual effects of retail price, display space, and newspaper advertisement

is highly inelastic. 8/ But the demand for the product in respect to the joint effects of these factors is elastic.

The implication is that the normal demand for winter pears is limited to a small group of consumers who make regular but infrequent purchases. And it is only when retailer merchandising and pricing policies are coordinated favorably for the product that other consumers (highly irregular or new purchasers) notice it and buy it.

The Bureau has promoted winter pears for more than 25 years. Through this promotion, they have maintained or developed a limited consumer market for for the product. But no current information is available concerning the buying practices of families for winter pears, as related to geographic region and size of city in which they live, family income, family size, presence and age of children, occupation and education of family head, age and work status of housewife, etc.

Research on the consumer market for pears would be most helpful in developing and refining an economical promotion program. It is well to know what techniques are effective in increasing sales of winter pears, but it is equally important to know where to direct these techniques.

APPENDIX

Methodology and Statistical Analysis

Analysis of variance and tests of significance

Analysis of variance was used to separate the variations in sales of each fruit studied (winter pears, apples, oranges, and bananas) that were attributable to cities, 4-week time periods, promotional techniques and no promotion, and experimental error (tables 15-19). 9/ Duncan's Multiple Range Test was used to detect significant sales differences between any two treatments, as well as to evaluate the effects of differences in prices and other merchandising practices for winter pears between treatments. 10/

8/ This inelasticity might well be a particular characteristic of low-volume fruits in the pioneering stage of promotion. In previous studies, it has been shown that sales of high-volume fruits such as apples, oranges, and bananas which are in a competitive stage of advertising, are highly responsive to the individual effects of retail price, display space, and newspaper advertisement space associated with the fruit.

9/ A technical discussion of analysis of variance as used in this study is given by Cochran, W. G., and Cox, G. M. Experimental Designs. John Wiley and Sons, Inc., pp. 117-127. 1957.

For a more advanced application of this technique in market research see article by Henderson, P. L., Hind, J. F., and Brown, S. E. Sales Effects of Two Campaign Themes. Jour. Advertising Res. Vol. 1, No. 6, pp. 2-8. Dec. 1961.

10/ Duncan, D. B. Multiple Range and Multiple F Tests. Biometrics 11:1, pp. 1-41. March 1955.

Provisions were made to adjust the sales of each fruit for variations among treatments which might be attributed to differences in number of customers patronizing the stores and the relative purchasing power of customers Total store sales in dollars were used as an index of customer traffic and purchasing power. However, no adjustments were necessary since the total store sales were about the same during each treatment (table 12).

Multiple covariance and regression analyses

Multiple covariance and regression analyses were used to determine the influence of retail merchandising practices for winter pears, apples, oranges and bananas on sales of pears. Merchandising factors evaluated were price per pound, square feet of display area, and lines of newspaper advertisement space. Total store sales in dollars as before were used to reflect number of customers and purchasing power of customers.

The relationships established between winter pear sales and each of the merchandising factors were based on weekly observations in 75 stores during a 20-week period, or a total of 1,500 observations.

The retail merchandising practices which were evaluated were those that could be quantified. It was not possible to measure the direct effects on sales of such nonquantitative factors as variety, size and quality of fruits, degree of ripeness, size of pricing unit, and type of display (prepackaged, bulk, or combination).

A multiple analysis of covariance was first used to adjust the sales variations for pears associated with cities and 4-week time periods. A multiple regression analysis was then made of the adjusted data (the residual sums of squares and cross products) to identify and quantify the net effects of merchandising factors significantly affecting sales. The multiple regression analysis was repeated until only factors statistically significant at the 0.05 probability level remained. The practical utility of a factor based upon the magnitude of its regression coefficient (b value) and coefficient of determination (R^2) was also a criterion for retaining it in subsequent analysis. 11/ In the final analysis, only those retail merchandising factors directly associated with pears are considered. The effects on pear sales of merchandising practices for the other fruits were shown to be negligible in an earlier analysis.

Relating Sales Returns to Promotional Outlay

Sales during no promotion, demonstrations, and dealer contests for the sample stores in each cooperating retail food organization were expanded to all stores in the organization. The mean sales of the sample stores during a 4-week test period were multiplied by the total number of stores in the

11/ The model for the complete analysis was programmed on the IBM 650 electronic data processing computer. Details of this program are outlined in No. 06.2002.8, parts 1, 4, 6, and 8 of the library series of programs at the Institute of Statistics, University of North Carolina, Raleigh, N. C.
For a more thorough discussion of this analysis and the formulation of the models involved see Henderson, Hind, and Brown, Sales Effects of Two Campaign Themes, pp. 8-9.

organization. 12/ Sales for stores with and without demonstrations were projected separately since the sales increase was substantially larger in the demonstration stores. An example of the projection using hypothetical data is given in table 13.

Costs of demonstrations and dealer contests were based on information obtained from the Oregon-Washington-California Pear Bureau. Promotional outlay included the direct costs incurred by the Bureau in conducting the store demonstrations or contests and the cost of point-of-purchase materials furnished cooperating stores. As in projecting sales, the production costs of point-of-purchase materials used in the sample stores were projected to all stores of cooperating organizations. It was assumed that use of Bureau point-of-purchase materials in all stores of a cooperating organization in a city was similar to that found in the sample stores (table 14).

Operating expenses included the salary and expenses of each fieldman while the two techniques were being tested. These expenses were based on the total number of days spent by the fieldmen in servicing the participating stores of an organization.

Total estimated winter pear sales for all five cities for each of the techniques were compared to no promotion. The difference was divided by the total cost of the technique, to get the estimated sales gain per dollar spent.

Method of weighting prices

Prices of winter pears displayed in each cooperating store were observed during the last part of each week. The price of each variety was then multiplied by volume sold during that week to convert sales to dollars. The dollar sales of all varieties were added and the sum was divided by the aggregate sales in pounds, to arrive at a weighted average price for winter pears.

12/ "Distribution of Food Store Sales in 185 Cities," prepared by Supermarket News, 1961, was used as a reference in determining the number of stores for the cooperating organization in each test city. Based on information in that publication, 75 sample stores representing some 20 different retail food organizations were selected and their sales were projected to 498 stores estimated to account for around 51.6 percent of total food store sales in the five test cities. Most likely, the percentage of winter pear sales accounted for by these stores in the five cities is even higher.

Table 13.--Hypothetical example of projecting sales of winter pears from a sample of stores in a retail food organization to all stores of that organization in a test city

Name of organization	Sample							Projection			
	No. of stores	Sales per 4-week test period during--						No. of stores in organization	Sales per 4-week test period during-- 1/		
		No promotion		Demonstrations		Dealer contests			No promotion	Demonstration	Dealer contests
		Total	Per store	Total	Per store	Total	Per store				
	Stores	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Stores	Pounds	Pounds	Pounds
Test city											
Organization X:											
Stores with demonstrations:	1	500	500	900	900	1,000	1,000	4	2,000	3,600	4,000
Stores without demonstrations:	4	2,400	600	3,200	800	6,000	1,500	19	11,400	15,200	28,500
Total.....	5	2,900	---	4,300	---	7,000	---	23	13,400	18,800	32,500

1/ Derived by multiplying number of stores in organization by average per store in sample.

Table 14.--Pear Bureau point-of-purchase materials: Number of pieces used by retailers, during promotion test, 75 supermarkets in 5 U.S. cities, five 4-week test periods between November 20, 1961, and April 20, 1962

Type of material 1/	Cleveland	Baltimore	Milwaukee	Houston	Atlanta	Total
Clusters	462	108	285	961	269	2,085
Banners	337	57	92	127	110	723
Bin strips	55	14	33	36	18	156
Total	860	179	420	1,161	397	3,017

1/ Pear Bureau identification codes for the different types are:
Clusters - Nos. 5826 and 5573
Banners - LPE, LPF, CPE, SFP, SPE, CFP, MFP, MPE
Bin Strips - No. 5827

Table 15.--Analysis of variance, winter pear sales in pounds, 75 supermarkets in 5 U.S. cities, five 4-week periods between November 19, 1961, and April 21, 1962 1/

Source of variation	Degrees of freedom	Sums of squares	Mean square	F ratio
		Thousands	Thousands	
Cities	4	2,010,131	502,533	2/ 77.96
Periods	4	8,330	2,082	0.82
Treatments	4	162,738	40,685	2/ 6.31
Error	12	77,350	6,446	---
Total	24	2,258,550	---	---

1/ Anjou, Bosc, and Comice pears.
2/ Significant at the 1 percent probability level.

Table 16.--Analysis of variance, apple sales in pounds, 75 supermarkets in 5 U.S. cities, five 4-week periods between November 19, 1961, and April 21, 1962

Source of variation	Degrees of freedom	Sums of squares	Mean square	F ratio
		Thousands	Thousands	
Cities	4	23,428,810	5,857,200	1/ 34.49
Periods	4	5,131,790	1,282,950	1/ 7.55
Treatments	4	591,470	147,870	0.87
Error	12	2,037,970	169,830	---
Total	24	31,190,040	---	---

1/ Significant at the 1 percent probability level.

Table 17.--Analysis of variance, orange sales in pounds, 75 supermarkets in 5 U.S. cities, five 4-week time periods between November 19, 1961, and April 21, 1962 1/

Source of variation	Degrees of freedom	Sums of squares	Mean square	F ratio
		Thousands	Thousands	
Cities	4	16,189,800	4,047,450	2/ 17.03
Periods	4	16,566,730	4,141,680	2/ 17.42
Treatments	4	6,166,710	154,180	.65
Error	12	2,852,780	257,730	---
Total	24	36,226,020	---	---

1/ Includes tangerines, tangelos, and satsumas.
2/ Significant at the 1 percent probability level.

Table 18.--Analysis of variance, banana sales in pounds, 75 supermarkets in 5 U.S. cities, five 4-week time periods between November 19, 1961, and April 21, 1962

Source of variation	Degrees of freedom	Sums of squares	Mean square	F ratio
		Thousands	Thousands	
Cities	4	24,506,230	6,126,560	1/ 54.11
Periods	4	888,630	222,160	1.96
Treatments	4	836,900	209,220	1.85
Error	12	1,358,660	113,220	---
Total	24	27,590,420	---	---

1/ Significant at the 1 percent probability level.

Table 19.--Analysis of variance, for total other fruit sales in pounds, 75 supermarkets in 5 U.S. cities, five 4-week time periods between November 19, 1961, and April 21, 1962

Source of variation	Degrees of freedom	Sums of squares	Mean square	F ratio
		Thousands	Thousands	
Cities	4	148,032,210	37,008,050	1/ 45.51
Periods	4	26,191,610	6,547,900	1/ 8.05
Treatments	4	3,211,040	802,760	0.99
Error	12	9,757,990	813,170	---
Total	24	187,192,850	---	---

1/ Significant at the 1 percent probability level.

Table 20.--Analysis of variance of winter pear sales associated with quantitative factors adjusted for nonquantitative factors, 75 supermarkets in 5 U.S. cities, five 4-week test periods between November 20, 1961 and April 21, 1962

Source of variation	Degrees of freedom	Sums of squares	Mean square	F ratio 1/
		Thousands	Thousands	
Total	1,499	1,755,302,300	---	---
Nonquantitative factors:				
Cities and time periods	24	1,650,833,830	68,784,743	815.13
Error 1	1,475	124,468,470	84,385	---
Quantitative factors: 2/				
Produce department sales	1	12,954,221	12,954,221	380.31
Weighted average price for winter pears	1	510,078	510,078	14.97
Display space for winter pears	1	12,831,224	12,831,224	376.70
Newspaper advertisement space for winter pears	1	4,371,074	4,371,074	128.327
Joint effects of above factors (interactions)	---	43,696,130	43,696,130	1,282.84
Error 2	1,471	50,105,743	34,062	---

1/ All factors statistically significant at the .005 probability level.
2/ Quantitative factors adjusted for each other and for nonquantitative factors of cities and time periods.

Letter Describing Dealer Contests

OREGON-WASHINGTON-CALIFORNIA PEAR BUREAU

Retail Store Contest in _____

Dates Involved: _____ to _____

The Pear Bureau, as named above, offers to present cash prizes to the produce managers of the retail stores which you service as outlined below.

1. a. $50.00 - To the produce manager who has the greatest increase in number of pounds sold in this four-week period.

   b. $25.00 - Second prize - same basis.

2. a. $50.00 - To the produce manager who has the greatest percentage increase in pear sales in this four-week period.

   b. $25.00 - Second prize - same basis.

   NOTE: Pears as mentioned above refer only to ANJOU, BOSC, & COMICE.

You may use the corresponding period last year, the previous four weeks, or any other criteria (e.g., attractiveness of displays) you desire as a measure in deciding the winner. Should you prefer to evaluate the winners on a basis other than we have suggested, that is perfectly satisfactory as long as it results in increased sales over a four-week period.

Upon notification from you of the names of the individuals who have been successful in this contest, the Pear Bureau representative in this area will personally present him with a check in the correct amount.

Thank you very much for your cooperation.

Yours very truly,

OREGON-WASHINGTON-CALIFORNIA
PEAR BUREAU

Sample letter sent to retailers outlining procedures for conducting dealer contests sponsored by Oregon-Washington-California Pear Bureau.

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