



Advertising . . .
Promotion . . .
Market Acceptance . . .
of
Pasteurized-Refrigerated Peaches



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*Advertising, Promotion, Market Acceptance of Pasteurized-Refrigerated Peaches**

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INTRODUCTION OF A NEW PRODUCT is often risky and costly. A well-planned marketing program supplemented when possible by a pre-test with consumers under actual market conditions would be helpful in reducing risk. By using this approach, fewer new products would be introduced and more probably would be successful.

Advertising and promotion programs play an important part in the introduction of new products. However, the technology available for new product development may be more abundant than knowledge about appropriate methods of advertising and promotion to develop a sufficient marketing program. Effectiveness of methods of advertising and promotion on market acceptance of a product must be known to develop such a program.

Since sales act as a yardstick in measuring market acceptance, the study reported here had these three objectives: (1) to determine the effect of specific methods of advertising and promotion on the sales of an experimental pack of pasteurized-refrigerated peaches (chilled peaches); (2) to determine per capita consumption and the repurchase pattern of chilled peaches as related to the socio-economic characteristics of consumers; and (3) to evaluate the institutional market for the experimental chilled

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peach product and a new commercial chilled peach product using sodium benzoate as the principal preservative.¹

Several studies conducted specifically to determine effectiveness of a special coupon offer have been generally favorable with respect to positive economic returns to the advertiser (3,5). Similar positive results have been shown in evaluating promotional themes (4,1) and levels of expenditures on advertising and promotion (2).

Standard methods of time series analysis have been criticized because the preconditions for the applicability of the statistical model are not met (7). An alternative approach to advertising research is the use of classical methods of statistics and experimental design.

Miller and Harris of the Auburn University Agricultural Experiment Station (6) conducted a study utilizing an experimental design to determine price elasticity and level of demand for pasteurized-refrigerated peaches (brand names "Chilco" and "Georgia Boy"). Analysis of variance of the data indicated that price was an important source of variation in peach sales. They concluded that a larger test with more stores would be required to show the effect of store size. In addition, they concluded that the effect of hand-lettered signs at point-of-sale was significant in the introductory period and indicated that a more extensive study of advertising would be useful.

Accordingly, this study was begun as part of a continuing research project.

EXPERIMENTAL METHODS

A three by eight factorial experimental design containing three store sizes and eight methods of advertising and promotion was used to determine the effect of methods of advertising and promotion on sales of experimental chilled peaches. Weekly store audits were made using broker-salesmen, mail-in cards, and telephone to compare sales in 24 test stores serviced by a regional grocery chain. Three store sizes (small, medium, and large) were used as criteria for dividing 24 test stores, Appendix Table 1, into 8 groups of 3 stores each, each group containing a small, medium, and large store. These eight groups were then subjected

¹ Definition of the technical process used in producing chilled peaches and initial market development of the product are given by Miller and Harris (6).

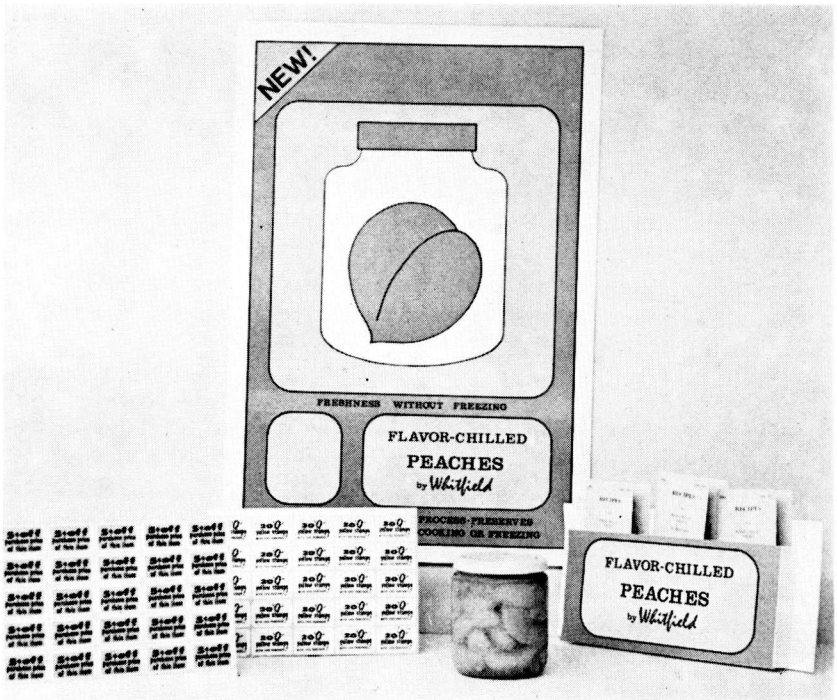
to eight methods of advertising and promotion. The eight methods were as follows:

- b₁ — newspaper only (control)
- b₂ — newspaper and posters and recipes
- b₃ — newspaper and cents-off coupons
- b₄ — newspaper and trading stamps
- b₅ — newspaper, posters and recipes, and cents-off coupons
- b₆ — newspaper, posters and recipes, and trading stamps
- b₇ — newspaper, cents-off coupons, and trading stamps
- b₈ — newspaper, posters and recipes, cents-off coupons, and trading stamps

Newspaper advertising consisted of inserting once per 15 weeks a 1/2-inch by 2-inch column insert in the weekly food advertisement from the grocery chain. The poster and recipe promotion consisted of erecting a point-of-purchase display simultaneous with publication of the newspaper advertisement. The point-of-purchase display consisted of a 15-inch by 22-inch, three-color poster and a box of free recipes. This display remained up until it was removed in the ordinary course of store business. The cents-off coupon and trading stamp promotion consisted of attaching 5-cents-off labels and 20 trading stamp labels on the jars for a fixed period rather than a fixed quantity of labels per store. Methods of promotion are illustrated on page 6.

Value of the 5-cents-off coupon equals the cost of 20 trading stamps when stamps are \$25 per 10,000; however, this is not equal to the cost of trading stamps to all retailers. Yet, advertising managers were interested in this comparison because the redemption value of the 20 trading stamps was approximately equal to 5 cents of retail value in items redeemed when the redemption value of 1,200 trading stamps was \$3. At the end of the first 15-week period of the study, methods of advertising and promotion were repeated and sales were audited for the second 15-week period.

A consumer panel of 38 known buyers of chilled peaches was chosen from 75 consumers responding to a special coupon offer of 300 trading stamps. An audit of selected commodities was received weekly from panel members. Data from weekly audits were collected to determine per capita consumption and repurchase pattern for the product. Panel members were given a questionnaire at the end of the study to determine socio-economic characteristics. The questionnaire indicated where they bought chilled peaches, what influences prompted their purchases, how



Three types of promotion used in selected chain stores—posters and recipes, 5-cents-off coupons, and trading stamps—are shown with a jar of the peaches.

they used the product, a taste rating, and comparisons of peach products.

A judgement sample was made of the institutional restaurant organizations in Montgomery, Alabama. Each institution in the sample was given a case of experimental chilled peaches and a case of commercial brand chilled peaches. A survey was made of these institutions to determine uses of the products, volume of use, and preferences.

ANALYSIS OF MARKET TEST DATA

The two 15-week periods were aggregated into one 30-week period, October 19, 1967, to May 15, 1968. This allowed the indirect action forms of promotion (posters and recipes) a longer period to show an effect, as compared with the direct action forms of advertising (cents-off and trading stamps), which have an immediate effect.

Store size was the most important source of variation, Table 1

TABLE 1. TOTAL SALES OF 16-OUNCE JARS OF PASTEURIZED-REFRIGERATED PEACHES, BY STORE SIZE AND METHOD OF ADVERTISING AND PROMOTION, 24 TEST STORES, OCTOBER 19, 1967, TO MAY 15, 1968

Method of advertising and promotion ¹	16-ounce jars sold			Totals	Average
	Store size				
	a ₁ (small)	a ₂ (medium)	a ₃ (large)		
	No.	No.	No.	No.	No.
b ₁	100	78	68	246	82
b ₂	63	110	70	243	81
b ₃ ²	28	567	129	724	241
b ₄	126	58	149	333	111
b ₅	69	83	118	270	90
b ₆	20	92	150	262	87
b ₇	69	72	77	218	73
b ₈	59	162	151	372	124
TOTAL.....	534	1,222	912	2,668	---
AVERAGE.....	67	153	114	---	111

¹ Key to method of advertising and promotion: b₁ (newspaper only, control); b₂ (newspaper and posters and recipes); b₃ (newspaper and cents-off coupons); b₄ (newspaper and trading stamps); b₅ (newspaper, posters and recipes, and cents-off coupons); b₆ (newspaper, posters and recipes, and trading stamps); b₇ (newspaper, cents-off coupons, and trading stamps); b₈ (newspaper, posters and recipes, cents-off coupons, and trading stamps).

² Possibly biased upward by uncontrolled advertising at the local level.

and Appendix Tables 2 and 3, and effective means of advertising varied according to store size. Only three methods of advertising were important in small size stores, all methods were important in their effect on sales in medium size stores, and only one method was effectively different from all others in large size stores, Appendix Tables 4, 5, and 6.

Methods were significant in their effect on sales, Appendix Table 7, but the main effects of advertising were more pronounced in small and medium size stores than in large stores. Allocation of advertising and promotional expenditures, however, was assumed to be made generally the same in all size stores. Therefore, average sales resulting from each method of advertising and promotion in all stores were calculated for use in an economic analysis. Average sales from treatments significantly different from each other during the aggregate test period are shown in Appendix Table 8.

Economic Evaluation of Advertising and Promotion Methods

Six of the eight methods of advertising and promotion solicited significantly different sales of chilled peaches.

The aggregated market study data for the period October 19,

1967, to May 15, 1968, indicated that addition of posters and recipes to newspaper advertising was not justifiable by increased sales. In addition, average chilled peach sales for newspaper advertising, cents-off coupons, and trading stamps (treatment b_7) were lower and significantly different from average sales for newspaper only (treatment b_1). The other methods of advertising and promotion increased sales above those expected from newspaper only and had significantly different effects.

Cost of each method of advertising and promotion was calculated as follows: Total cost of the newspaper advertising was based on cost data provided by the advertising manager at the grocery chain and was divided equally among the 24 test stores. The contracted cost of the posters and recipes used was divided equally among the 12 test stores that received posters and recipes in the experimental design. Cost of cents-off and trading stamp promotion was based on number of 5-cents-off coupons and 20 trading stamp coupons used in each specific test store, Appendix Tables 9 and 10, rather than a fixed amount per store as in the cost for newspaper advertising, posters, and recipes.

In the market test period, an increase in sales of one jar cost an average of \$1.43 for newspaper, posters and recipes, and cents-off coupons (treatment b_5), \$2.14 for newspaper, posters and recipes, and trading stamps (treatment b_6), and \$0.36 for newspaper, posters and recipes, cents-off coupons, and trading stamps (treatment b_8). Since these costs were above the 12-cents-per-jar return available to the advertiser, no method of advertising and promotion that included posters and recipes was economically justified. Net return of 12 cents per jar was based on approximately a 30 per cent mark-up.

Newspaper, cents-off coupons, and trading stamps (treatment b_7), had lower and significantly different sales than did newspaper advertising only (treatment b_1). Consequently, it was not profitable to pay for this increased cost of promotion and get less sales. Newspaper and cents-off coupons (treatment b_3) had the highest average sales by far; however, the medium size store in this method had exceptionally high sales attributed to promotion by a local chamber of commerce.

For economic analysis, sales in the medium size store having newspaper advertising and cents-off coupons were discounted by using the average sales figure of the medium size stores as representative of this store. On this basis, newspaper advertising and cents-off coupons had slightly lower sales and greater cost than

TABLE 2. ORDERS BY 24 TEST STORES FOR CHILLED PEACHES AND THREE CHILLED CITRUS PRODUCTS, BY METHOD OF ADVERTISING AND PROMOTION, FEBRUARY 1 TO MAY 15, 1968

Method of advertising and promotion ¹ and store size ²	Cases ordered			
	Chilled peaches (doz. 16-oz. jars/case)	Ambrosia (doz. 16-oz. jars/case)	Fruit salad (doz. 16-oz. jars/case)	Unsweetened grapefruit sections (doz. 32-oz. jars/case)
	Cases	Cases	Cases	Cases
b₁ method				
a ₁	3	2	0	0
a ₂	9	3	3	2
a ₃	2	2	3	1
b₂ method				
a ₁	5	2	1	0
a ₂	5	2	3	2
a ₃	3	1	4	1
b₃ method				
a ₁	1	0	1	0
a ₂	12	0	1	0
a ₃	5	4	5	6
b₄ method				
a ₁	4	0	0	0
a ₂	2	0	2	0
a ₃	5	0	3	0
b₅ method				
a ₁	0	1	1	0
a ₂	3	1	2	3
a ₃	5	1	2	1
b₆ method				
a ₁	0	0	0	0
a ₂	5	3	1	2
a ₃	8	4	3	4
b₇ method				
a ₁	0	0	1	0
a ₂	0	1	0	1
a ₃	4	4	5	2
b₈ method				
a ₁	3	0	0	0
a ₂	8	4	8	3
a ₃	7	3	2	3
TOTAL	99	38	51	33

¹ Key to method of advertising and promotion for chilled peaches: b₁ (newspaper only, control); b₂ (newspaper and posters and recipes); b₃ (newspaper and cents-off coupons); b₄ (newspaper and trading stamps); b₅ (newspaper, posters and recipes, and cents-off coupons); b₆ (newspaper, posters and recipes, and trading stamps); b₇ (newspaper, cents-off coupons, and trading stamps); and b₈ (newspaper, posters and recipes, cents-off coupons, and trading stamps).

² Key to store size: a₁ (small), a₂ (medium), a₃ (large).

did newspaper and trading stamps. Net returns from advertising were approximately equal to costs for each treatment.

Newspaper advertising, common to all methods of advertising and promotion in the experimental design, was an aid in getting store managers to order sufficient shelf stock for advertising and promotion. Store managers, with few exceptions, ordered stock prior to an advertisement. Analysis of covariance with amount of shelf stock as a covariate indicated that increased shelf stock was a significant variable in explaining increased sales.

Another economic implication in this study concerned market acceptance of experimental chilled peaches. One measure of acceptance was a comparison of the orders for this product and three chilled citrus products that were competing for shelf space, Table 2. These orders were obtained from order cards, described previously, for the period from February 1 to May 15, 1968. The comparison was by method of advertising and promotion, store size, and product. Data indicated that orders for experimental chilled peaches were higher than orders for any of the three chilled citrus products. Furthermore, orders for the chilled peaches were higher than for any two of the chilled citrus products combined.

CONSUMER PANEL

The relationship of per capita consumption and repurchase pattern to socio-economic characteristics of consumers was accomplished by use of diaries and a questionnaire.

Distribution of selected panel members (those who sent eight or more diaries) by store size and method of advertising and promotion is shown in Table 3. Panel members were found to be equally distributed among store sizes or not significantly different from an equal distribution of 10.6 panel members per store size. In addition, distribution of panel members by method of advertising and promotion (b_1 through b_8 where a method included all three store sizes) was not significantly different from an equal distribution of 3.6 members per method. Chain store customers, however, may not be representative of the total population of consumers. A comparison of the distribution by family income of consumer panel members to the Alabama population is presented in Table 4. This comparison indicates that a high percentage of panel members were in the high income brackets. However, a comparison of the distribution by age of consumer panel members

TABLE 3. DISTRIBUTION OF SELECTED PANEL MEMBERS IN 25¹ TEST STORES, BY STORE SIZE AND METHOD OF ADVERTISING AND PROMOTION, FEBRUARY 1 TO MAY 15, 1968

Method of advertising and promotion ²	Panel member distribution			Totals
	Store size			
	a ₁ (small)	a ₂ (medium)	a ₃ (large)	
	No.	No.	No.	No.
b ₁	0	1	1	2
b ₂	0	3	1	4
b ₃	0	0	3	3
b ₄	1	1	1	3
b ₅	2	4	0	6
b ₆	2	2	3	7
b ₇	2	0	0	2
b ₈	1	2	0	3
b ₉	-	-	2	2
TOTAL.....	8	13	11	32

¹ Method or treatment b₉ contains one large store in which a special in-store demonstration was planned but not carried out.

² Key to method of advertising and promotion: b₁ (newspaper only, control); b₂ (newspaper and posters and recipes); b₃ (newspaper and cent-off coupons); b₄ (newspaper and trading stamps); b₅ (newspaper, posters and recipes, and cents-off coupons); b₆ (newspaper, posters and recipes, and trading stamps); b₇ (newspaper, cents-off coupons, and trading stamps); b₈ (newspaper, posters and recipes, cents-off coupons, and trading stamps).

TABLE 4. DISTRIBUTION OF CONSUMER PANEL MEMBERS, 1967, AND THE ALABAMA POPULATION, 1960, BY FAMILY INCOME

Family income	Distribution of consumer panel	Distribution of Alabama population ¹
	Per cent	Per cent
Less than \$3,000.....	13.3	42.2
\$3,000 to \$4,999.....	13.3	20.6
\$5,000 to \$5,999.....	3.3	8.8
\$6,000 to \$6,999.....	3.3	6.8
\$7,000 to \$9,999.....	30.1	10.8
\$10,000 and over.....	36.7	6.8

¹ U.S. Bureau of the Census, *Twenty-first Census of the United States: 1960. Population, I*, 65.

TABLE 5. DISTRIBUTION OF CONSUMER PANEL MEMBER, BY AGE, 1968, AND THE ALABAMA POPULATION, 1960

Age in years	Distribution of consumer panel	Distribution of Alabama population ¹
	Per cent	Per cent
Under 18.....	40.9	39.5
18-64.....	45.5	52.5
65 and over.....	13.6	8.0

¹ U.S. Bureau of the Census, *Twenty-first Census of the United States: 1960. Population, I*, 16.

to that of the Alabama population was found to be not significantly different, Table 5.²

Diary Analysis

The diary — a list of selected products that could be grown in Alabama, except orange juice — was used in obtaining a weekly audit of the panel members' purchases. Participants were rewarded with 100 trading stamps for each diary they returned. Data from the weekly diaries were collected over a 15-week period to determine per capita consumption and repurchase pattern of experimental chilled peaches. Some panel members dropped out or sent in too few diaries to be used. To determine the repurchase pattern and per capita consumption, diaries from 32 panel members who sent in eight or more diaries were analyzed.

The panel members were divided into two income groups. The low income group, panel members with less than \$7,000 annual family income, consisted of 12 members. There were 20 in the

TABLE 6. AVERAGE PURCHASE, AVERAGE TIME BETWEEN PURCHASES, HOUSEHOLD CONSUMPTION, AND PER CAPITA CONSUMPTION OF PEACHES BY PANEL MEMBERS, BY INCOME GROUP, FEBRUARY 1 TO MAY 15, 1968

Item measured and unit of measure	Resultant, by income group			
	All canned peaches		Chilled peaches	
	Low income	High income	Low income	High income
Average purchase ¹ , lb.....	2.89	1.60	2.30	1.22
Average time between purchases ¹ , wk.....	1.38	2.52	3.93	2.63
Household consumption ² , lb.....	12.75	3.20	5.17	3.35
Per capita consumption ² , lb.....	4.78	.94	1.94	.99

¹ Based on the number of people who purchased chilled peaches more than once; 6 out of 12 in the low income group and 12 out of 20 in the high income group.

² Based on a panel of 32 for the period indicated.

high income group, panel members with \$7,000 or more family income.

The analysis indicated a difference by income group for average purchase, average time between purchases, household consumption, and per capita consumption for both experimental chilled peaches and all canned peaches, Table 6. Average purchase was higher for both products in the low income group; however, average time between purchases was longer in the low income group for experimental chilled peaches and was longer in the high income group for all canned peaches. Household con-

² Chi-square value equaled 4.902 with two degrees of freedom.

sumption figures indicated that both chilled and canned peaches tended to have a negative income elasticity.

In the low income group, total peach consumption was composed of 29 per cent chilled peaches and 71 per cent canned peaches. In the high income group, total peach consumption was found to be 51 per cent chilled peaches and 49 per cent canned peaches. The high income group's relative increase of 22 per cent in experimental chilled peach consumption coupled with a 22 per cent relative decrease in consumption of canned peaches indicated a substitution of chilled for canned peaches, even though their total peach consumption decreased.

Questionnaire Analysis

At the end of the study panel members were asked to react to questions concerning peach use. Experimental chilled peaches were the only chilled peaches in the test stores; however, there were several close substitutes, canned, frozen, and fresh (in season) peaches. Thus, a comparison of chilled peaches to each of these products was made. The comparison of chilled to canned indicated that 28 of the 32 panel members thought chilled peaches were better quality, while only 4 said they were about equal.

When chilled peaches were compared to fresh peaches, 9 panel members said chilled were better, 19 rated them about the same, and 4 said they were not as good as fresh peaches. In addition, when chilled peaches were compared to frozen peaches, 21 of 31 members who responded said that chilled were better than frozen, 8 said they were about the same, and only 2 said that chilled were not as good as frozen peaches, Table 7.

The pasteurization process (6) by which chilled peaches were preserved has the attribute of maintaining fresh taste in fruits. When panel members were asked what type of taste the product

TABLE 7. RESPONSE OF PANEL MEMBERS TO COMPARISONS OF CHILLED PEACHES TO CANNED, FRESH, AND FROZEN PEACHES, MAY, 1968

Response	Comparison by panel members		
	Chilled to canned	Chilled to fresh	Chilled to frozen
	No.	No.	No.
No response.....	0	0	1
Better.....	28	9	21
About the same.....	4	19	8
Not as good.....	0	4	2

TABLE 8. NUMBER OF PANEL MEMBERS WHO REPORTED VARIOUS USES OF EXPERIMENTAL CHILLED PEACHES, FEBRUARY 1 TO MAY 15, 1968

Salads		Desserts	
Use	Number	Use	Number
No response.....	10	Shortcakes.....	16
With cottage cheese.....	16	Mixed with other fruit.....	1
With jello.....	3	Ice cream.....	1
With other fruit.....	1	Cereals.....	10
Plain.....	2	Plain.....	4

had, 30 thought that chilled peaches tasted fresh, while the remaining 2 said they had a canned taste.

Chilled peach uses were divided into two major classes, desserts and salads, each with appropriate dishes. By far the most frequent use of chilled peaches in salads was with cottage cheese, while in desserts the most frequent use was with shortcakes, Table 8.

At the time the questionnaire was completed by panel members, 14 reported the product in their homes and all panel members said they would buy chilled peaches again.

THE INSTITUTIONAL MARKET

The range of restaurants in the survey included clubs, motels, hotels, restaurants, and nursing homes. The average price of meals with which the peaches were served ranged from \$0.65 in the nursing homes to \$3 in a club, while price per serving in which

TABLE 9. SERVING PER 16-OUNCE JAR OF PEACHES AND SELLING PRICE PER SERVING, BY TYPE OF USE IN SEVEN INSTITUTIONS, MONTGOMERY, ALABAMA, JANUARY, 1968

Type of use	Commercial product		Experimental product	
	Servings per 16-ounce jar	Selling price per serving ¹	Servings per 16-ounce jar	Selling price per serving ¹
	No.	Cents	No.	Cents
Cereal.....	—	—	4	25 ²
Cobbler.....	4	25	3	25
Compotes.....	4	40	4	40
Cottage cheese salads.....	10	27	8	27
Jello salad.....	10	20	8	20
Mixed fruit.....	62	10	62	10
Salads.....	10	15	7	25
Shortcakes.....	6	45	5	40
Sundaes.....	6	35	6	35
Tarts.....	5	40	4	40
AVERAGE.....	13	29	11	29

¹ The selling price of a serving includes cost of all ingredients, including peaches.

² Cost to customer for adding fruit to cereal.

TABLE 10. ESTIMATED VOLUME OF USE PER MONTH OF CANNED PEACHES AND DESIRED USE OF CHILLED PEACHES AS A SUBSTITUTE, BY TYPE OF INSTITUTION, MONTGOMERY, ALABAMA, JANUARY 1968

Type of institution	No. 10 ¹ cans used or desired	
	Use of canned peaches	Desired use of chilled peaches
	No.	No.
Club.....	6	5
Club.....	33	33
Motel.....	21	12
Motel.....	24	9
Hospital.....	84	24
Nursing home.....	13	13
Hotel.....	14	28
AVERAGE.....	27.9	17.7

¹ A No. 10 can contains 96 ounces.

the peaches were used ranged from \$0.10 when mixed with other fruit to \$0.45 for a shortcake.

Use of the new products was principally in desserts like tarts, sundaes, shortcakes, compotes, cobblers, and mixed fruit.

Servings per 16-ounce jar and selling price of the servings are presented in Table 9. Based on servings per 16-ounce jar and selling price of servings, weighted average value of servings from a 16-ounce jar of commercial chilled peaches was \$2.42 and from experimental chilled peaches \$2.08. This weighted average value included cost of all ingredients in the serving, including the peaches. The higher weighted average value of servings from commercial chilled peaches was attributed to smaller slices.

A case of experimental chilled peaches was used on the average in approximately 4.6 meals. Average use was 42 ounces per meal and an average of 352 customers were served per meal. The calculated usage rate would be 13 cans (number 10) per month to serve 30 meals. Comparable with the calculated usage rate was the average volume of canned peaches used per month, 27.9 number 10 cans, and the desired use per month of chilled peaches, 17.7 number 10 cans, Table 10.

In taste comparisons made by restaurant managers, experimental chilled peaches were ranked higher than a commercial brand and ranked better than or equal to frozen peaches, Appendix Table 11.

SUMMARY AND CONCLUSIONS

In the analysis of test sales of pasteurized-refrigerated peaches, store size was the most important source of variation in aggregate

sales data for 30 weeks, followed by the interaction of store size and methods of advertising and promotion. Methods of advertising and promotion, however, were the most important source during the first 15 weeks of the study. Several comparisons that indicated significant effects from advertising and promotion in large stores during the first 15 weeks were not significant in the second period when methods were repeated.

Best methods of advertising and/or promotion depended on size of stores in which they were used. More methods of advertising and promotion had significant effects on sales in the small and medium stores than in the large size stores.

Direct-action forms of advertising and promotion had a greater effect on sales than indirect forms. Also, the ways in which direct-action forms of advertising and promotion were combined resulted in significantly different effects. The most outstanding example was the combination of cents-off coupons and trading stamps. Use of 20 trading stamps had a greater effect on sales than an equivalent retail value of a 5-cents-off coupon, but either of these direct-action forms of promotion solicited more sales response separately than when combined. Apparently, an inferior image was projected by the larger reduction in price. When all forms of advertising and promotion (newspaper, posters and recipes, cents-off coupons, and trading stamps) were used together a significantly greater effect was obtained than from any form or combination of forms. However, additional costs of combining all forms of advertising and promotion were greater than additional returns.

Sales response to posters and recipes, a means of indirect-action promotion, was found to be less than the average effect of other methods of advertising and promotion. Over a longer time than was observed in this study, however, a possible cumulative effect could accrue to posters and recipes.

Economic evaluation of the methods of advertising and promotion indicated that one, and possibly two, of the eight methods used were justifiable during the study period. Newspaper advertising and 20 trading stamps on an item selling for 39 cents per 16 ounces did increase sales so that additional revenue was greater than additional cost. Net returns from newspaper advertising and a 5-cents-off coupon were also positive, but additional sales for this method may have been biased upward. The newspaper advertisement, announcing a price reduction at the beginning of the

second period, was observed to be effective in getting shelves stocked and warrants further study. Covariance analysis indicated that amount of shelf stock was a significant variable in explaining differences in retail sales.

High income respondents purchased smaller amounts of peaches and bought more frequently than did respondents in the low income group. The average repurchase pattern was approximately 2.30 pounds every 3.93 weeks for the low income group and 1.22 pounds every 2.63 weeks for the high income group. Per capita consumption of experimental chilled peaches during the study period was approximately 1.94 pounds for the low income group and 0.99 pound for the high income group. Negative income elasticity indicated by the panel data for canned peaches and experimental chilled peaches is a prediction of declining demand for processed peaches as incomes increase. However, there was an apparent substitution of experimental chilled peaches for canned peaches with increasing income. Consequently, it was concluded that peach processors will need to change to a higher quality product if they are to take advantage of the diminishing market for processed peaches that develops with higher incomes.

The institutional market was evaluated as a possible outlet for the experimental chilled peach product and a competing commercial chilled peach product. An attempt was made to determine uses of the products, volume of use, and preferences. The new products were used more in desserts, with special emphasis on those where the "like-fresh" taste of the product could be detected. The estimated volume of use per month of canned peaches and the desired use of experimental chilled peaches as a substitute indicated that chilled peaches could, if competitively priced, capture approximately half of the existing market for peaches in these institutions and possibly expand the total market. In addition, all of the institutional food managers who responded preferred experimental chilled peaches prepared by a pasteurized-refrigerated process to the commercial chilled peach slice preserved with sodium benzoate.

Chilled peaches led ambrosia, fruit salad, and unsweetened grapefruit sections in quantity ordered from the warehouse during the market test period. Peach orders included initial stocking, however, and reorders of peaches were similar in volume to chilled citrus orders.

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APPENDIX

APPENDIX TABLE 1. LOCATION OF TEST STORES, BY METHOD OF ADVERTISING AND PROMOTION AND STORE SIZE, OCTOBER 19, 1967, TO MAY 15, 1968

Method of advertising and promotion	Location of stores		
	a ₁ (small)	a ₂ (medium)	a ₃ (large)
b ₁	Elba, Ala.	Auburn, Ala.	Montgomery, Ala.
b ₂	Luverne, Ala.	Prattville, Ala.	Montgomery, Ala.
b ₃	East Brewton, Ala.	Clanton, Ala.	Montgomery, Ala.
b ₄	West Point, Ga.	Millbrook, Ala.	Tuskegee, Ala.
b ₅	Ft. Deposit, Ala.	Montgomery, Ala.	Selma, Ala.
b ₆	Brundidge, Ala.	Montgomery, Ala.	Montgomery, Ala.
b ₇	Prattville, Ala.	Tallassee, Ala.	Montgomery, Ala.
b ₈	Georgiana, Ala.	Montgomery, Ala.	Wetumpka, Ala.
b ₉	Montgomery, Ala.

APPENDIX TABLE 2. AGGREGATE ANALYSIS OF VARIANCE OF SALES OF 16-OUNCE JARS OF CHILLED PEACHES, 24 TEST STORES, OCTOBER 19, 1967, TO MAY 15, 1968

Source of variation	Degrees of freedom	Sum of squares	Mean square	F
Treatments.....	(ab-1=23)	(8,359.24)		
Replicates (weeks).....	r-1=29	2,769.08	95.49	3.25 ²
A (store size).....	a-1=2	989.34	494.67	16.85 ²
Error (a).....	(a-1)(r-1)=58	1,702.91	29.36	
B (method of advertising and promotion).....	b-1=7	2,136.71	305.24	23.66 ²
A x B.....	(a-1)(b-1)=14	5,233.19	373.80	28.98 ²
Error (b).....	a(r-1)(b-1)=609	7,954.34	12.90	
TOTAL.....	abr-1=719	20,685.57		

¹ Significant at the .05 level.

² Significant at the .01 level.

APPENDIX TABLE 3. ANALYSIS OF VARIANCE OF SIMPLE EFFECTS OF STORE SIZE AND METHODS OF ADVERTISING AND PROMOTION ON SALES OF PASTEURIZED-REFRIGERATED PEACHES, 24 TEST STORES, OCTOBER 19, 1967, TO MAY 15, 1968

Treatment comparisons ¹	Degrees of freedom	Sum of squares	Mean square	F
Among methods within a ₁	8-1=7	279.58	39.94	2.26 ²
Among methods within a ₂	8-1=7	6,771.91	967.42	54.63 ³
Among methods within a ₃	8-1=7	318.40	45.49	2.57 ²
Among stores within b ₁	3-1=2	17.87	8.94	.50
Among stores within b ₂	3-1=2	42.87	21.44	1.21
Among stores within b ₃	3-1=2	5,472.95	2,736.48	154.52 ³
Among stores within b ₄	3-1=2	149.27	74.64	4.21 ²
Among stores within b ₅	3-1=2	42.47	21.24	1.20
Among stores within b ₆	3-1=2	282.76	141.38	7.98 ³
Among stores within b ₇	3-1=2	1.09	.54	.03
Among stores within b ₈	3-1=2	213.27	106.64	6.02 ³
ERROR	ab(r-1)=696	12,326.33	17.71	

¹ Key to treatments: store size a₁ (small), a₂ (medium), a₃ (large); method of advertising and promotion b₁ (newspaper only, control); b₂ (newspaper and posters and recipes); b₃ (newspaper and cents-off coupons); b₄ (newspaper and trading stamps); b₅ (newspaper, posters and recipes, and cents-off coupons); b₆ (newspaper, posters and recipes, and trading stamps); b₇ (newspaper, cents-off coupons, and trading stamps); b₈ (newspaper, posters and recipes, cents-off coupons, and trading stamps).

² Significant at the .05 level.

³ Significant at the .01 level.

APPENDIX TABLE 4. ORTHOGONAL COMPARISONS OF SALES OF PASTEURIZED-REFRIGERATED PEACHES IN EIGHT SMALL TEST STORES, BY METHOD OF ADVERTISING AND PROMOTION, OCTOBER 19, 1967, TO MAY 15, 1968

Comparison	Sales comparison by treatment (number of 16-ounce jars)								Q	Kr	SS ¹	F
	b ₁ 100	b ₂ 63	b ₃ 28	b ₄ 126	b ₅ 69	b ₆ 20	b ₇ 69	b ₈ 59				
b ₂ vs. rest.....	-	+	-	-	+	+	-	+	-112	8(30)	52.27	7.03 ³
b ₃ vs. rest.....	-	-	+	-	+	-	+	+	- 84	8(30)	29.50	3.96 ²
b ₄ vs. rest.....	-	-	-	+	-	+	+	+	+ 14	8(30)	.82	.11
b ₅ vs. rest.....	+	-	-	+	+	-	-	+	+174	8(30)	126.15	16.98 ³
b ₆ vs. rest.....	+	-	+	-	-	+	-	+	-120	8(30)	60.00	8.08 ³
b ₇ vs. rest.....	+	+	-	-	-	-	+	+	+ 48	8(30)	9.60	1.29
b ₈ vs. rest.....	-	+	+	+	-	-	-	+	+ 18	8(30)	1.35	.18
TOTAL.....											279.59	

¹ The sum of squares for the orthogonal comparisons is equal to mean squares since there is one degree of freedom in each case. However, the error sum of squares has 232 degrees of freedom making the error mean square equal 7.3 (1,724.27 ÷ 232).

² Significant at the .05 level.

³ Significant at the .01 level.

APPENDIX TABLE 5. ORTHOGONAL COMPARISONS OF SALES OF PASTEURIZED-REFRIGERATED PEACHES IN EIGHT MEDIUM TEST STORES, BY METHOD OF ADVERTISING AND PROMOTION, OCTOBER 19, 1967, TO MAY 15, 1968

Comparison	Sales comparison by treatment (number of 16-ounce jars)								Q	Kr	SS ¹	F
	b ₁ 78	b ₂ 110	b ₃ 567	b ₄ 58	b ₅ 83	b ₆ 92	b ₇ 72	b ₈ 162				
b ₂ vs. rest.....	-	+	-	-	+	+	-	+	-328	8(30)	448.27	22.72 ³
b ₃ vs. rest.....	-	-	+	-	+	-	+	+	+546	8(30)	1,242.15	62.96 ³
b ₄ vs. rest.....	-	-	-	+	-	+	+	+	-454	8(30)	858.82	43.53 ³
b ₅ vs. rest.....	+	-	-	+	+	-	-	+	-460	8(30)	881.67	44.69 ³
b ₆ vs. rest.....	+	-	+	-	-	+	-	+	+576	8(30)	1,382.40	70.07 ³
b ₇ vs. rest.....	+	+	-	-	-	-	+	+	-378	8(30)	595.35	30.17 ³
b ₈ vs. rest.....	-	+	+	+	-	-	-	+	+572	8(30)	1,363.27	69.10 ³
TOTAL.....											6,771.93	

¹ The sum of squares for the orthogonal comparisons is equal to mean squares since there is one degree of freedom in each case. However, the error sum of squares has 232 degrees of freedom making the error mean square equal 19.73 (4,578.07 ÷ 232).

² Significant at the .05 level.

³ Significant at the .01 level.

APPENDIX TABLE 6. ORTHOGONAL COMPARISONS OF SALES OF PASTEURIZED-REFRIGERATED PEACHES IN EIGHT LARGE TEST STORES, BY METHOD OF ADVERTISING AND PROMOTION, OCTOBER 19, 1967, TO MAY 15, 1968

Comparison	Sales comparison by treatment (number of 16-ounce jars)								Q	K _r	SS ¹	F
	b ₁ 68	b ₂ 70	b ₃ 129	b ₄ 149	b ₅ 118	b ₆ 150	b ₇ 77	b ₈ 151				
b ₂ vs. rest.....	-	+	-	-	+	+	-	+	+ 66	8(30)	18.15	.70
b ₃ vs. rest.....	-	-	+	-	+	-	+	+	+ 38	8(30)	6.02	.23
b ₄ vs. rest.....	-	-	-	+	-	+	+	+	+142	8(30)	84.02	3.24
b ₅ vs. rest.....	+	-	-	+	+	-	-	+	+ 60	8(30)	15.00	.58
b ₆ vs. rest.....	+	-	+	-	-	+	-	+	+ 84	8(30)	29.40	1.13
b ₇ vs. rest.....	+	+	-	-	-	-	+	+	-180	8(30)	135.00	5.20 ²
b ₈ vs rest.....	-	+	+	+	-	-	-	+	+ 86	8(30)	30.82	1.19
TOTAL.....											318.41	

¹ The sum of squares for the orthogonal comparisons is equal to mean squares since there is one degree of freedom in each case. However, the error sum of squares has 232 degrees of freedom making the error mean square equal 25.97 (6,024.00 ÷ 232).

² Significant at the .05 level.

³ Significant at the .01 level.

APPENDIX TABLE 7. ANALYSIS OF VARIANCE OF THE MAIN EFFECTS OF THE TREATMENTS OR METHODS OF ADVERTISING AND PROMOTION ON SALES OF PASTEURIZED-REFRIGERATED PEACHES, 24 TEST STORES, OCTOBER 19, 1967, TO MAY 15, 1968

Source of variation ¹	Degrees of freedom	Sum of squares	Mean square	F
TOTAL.....	(b-1)=7	(2,136.71)		
Treatment b ₂	1	194.27	194.27	10.97 ³
Treatment b ₃	1	347.22	347.22	19.61 ³
Treatment b ₄	1	123.34	123.34	6.96 ²
Treatment b ₅	1	70.94	70.94	4.01 ²
Treatment b ₆	1	405.00	405.00	22.87 ³
Treatment b ₇	1	361.25	361.25	20.40 ³
Treatment b ₈	1	634.69	634.69	35.84 ³
ERROR.....	ab(r-1)=696	12,326.33	17.71	

¹ Key to method of advertising and promotion: b₂ (newspaper and posters and recipes); b₃ (newspaper and cents-off coupons); b₄ (newspaper and trading stamps); b₅ (newspaper, posters and recipes, and cents-off coupons); b₆ (newspaper, posters and recipes, and trading stamps); b₇ (newspaper, cents-off coupons, and trading stamps); b₈ (newspaper, posters and recipes, cents-off coupons, and trading stamps).

² Significant at the .05 level.

³ Significant at the .01 level.

APPENDIX TABLE 8. DUNCAN'S NEW MULTIPLE RANGE TEST ON AVERAGE SALES OF CHILLED PEACHES, BY METHODS OF ADVERTISING AND PROMOTION IN 24 TEST STORES, OCTOBER 19, 1967, TO MAY 15, 1968

Measurement tested	Result, by treatment ¹							
	b ₇	b ₂	b ₁	b ₆	b ₅	b ₄	b ₈	b ₃
Average sales ² (16-ounce jars per 30-week period).....	73	81	82	87	90	111	124	241

¹ Treatments are arranged in order of increasing mean sales: b₇ (newspaper, cents-off coupons, and trading stamps); b₂ (newspaper and posters and recipes); b₁ (newspaper only, control); b₆ (newspaper, posters and recipes, and trading stamps); b₅ (newspaper, posters and recipes, and cents-off coupons); b₄ (newspaper and trading stamps); b₈ (newspaper, posters and recipes, cents-off coupons, and trading stamps); b₃ (newspaper and cents-off coupons).

² Treatment averages that are not significantly different are joined by a continuous line.

APPENDIX TABLE 9. ESTIMATED USE OF 5-CENTS-OFF COUPONS AND 20 TRADING STAMP COUPONS IN THE PROMOTION OF PASTEURIZED-REFRIGERATED PEACHES IN 18 TEST STORES, OCTOBER 19, 1967, TO MAY 15, 1968

Method of advertising and promotion ¹ and store size ²	Estimated use			
	5-cents-off coupons		20 trading stamp coupons	
	Number	Dollars	Number	Dollars
b₃ method				
a ₁	27	1.35	---	---
a ₂	180	9.00	---	---
a ₃	48	2.40	---	---
b₄ method				
a ₁	---	---	61	3.05
a ₂	---	---	24	1.20
a ₃	---	---	36	1.80
b₅ method				
a ₁	24	1.20	---	---
a ₂	24	1.20	---	---
a ₃	42	2.10	---	---
b₆ method				
a ₁	---	---	24	1.20
a ₂	---	---	24	1.20
a ₃	---	---	42	2.10
b₇ method				
a ₁	39	1.95	39	1.95
a ₂	36	1.80	36	1.80
a ₃	48	2.40	48	2.40
b₈ method				
a ₁	39	1.95	39	1.95
a ₂	60	3.00	60	3.00
a ₃	57	2.85	57	2.85
TOTAL.....	624	31.20	490	24.50

¹ Key to method of advertising and promotion: b₃ (newspaper and cents-off coupons); b₄ (newspaper and trading stamps); b₅ (newspaper, posters and recipes, and cents-off coupons); b₆ (newspaper, posters and recipes, and trading stamps); b₇ (newspaper, cents-off coupons, and trading stamps); b₈ (newspaper, posters and recipes, cents-off coupons, and trading stamps).

² Key to store size: a₁ (small), a₂ (medium), a₃ (large).

APPENDIX TABLE 10. COST OF EACH METHOD OF ADVERTISING AND PROMOTION OF PASTEURIZED-REFRIGERATED PEACHES, BY STORE SIZE, 24 TEST STORES, OCTOBER 19, 1967, TO MAY 15, 1968

Method of advertising and promotion ¹	Cost, by store size			
	a ₁ (small)	a ₂ (medium)	a ₃ (large)	Total
	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
b ₁	1.20	1.20	1.20	3.60
b ₂	11.12	11.12	11.12	33.36
b ₃	2.55	10.20	3.60	16.35
b ₄	4.25	2.40	3.00	9.65
b ₅	12.32	12.32	13.22	37.86
b ₆	12.32	12.32	13.22	37.86
b ₇	5.10	4.80	6.00	15.90
b ₈	15.02	17.12	16.82	48.96
TOTAL.....	63.88	71.48	68.18	203.54

¹ Key to method of advertising and promotion: b₁ (newspaper only, control); b₂ (newspaper and posters and recipes); b₃ (newspaper and cents-off coupons); b₄ (newspaper and trading stamps); b₅ (newspaper, posters and recipes, and cents-off coupons); b₆ (newspaper, posters and recipes, and trading stamps); b₇ (newspaper, cents-off coupons, and trading stamps); b₈ (newspaper, posters and recipes, cents-off coupons, and trading stamps).

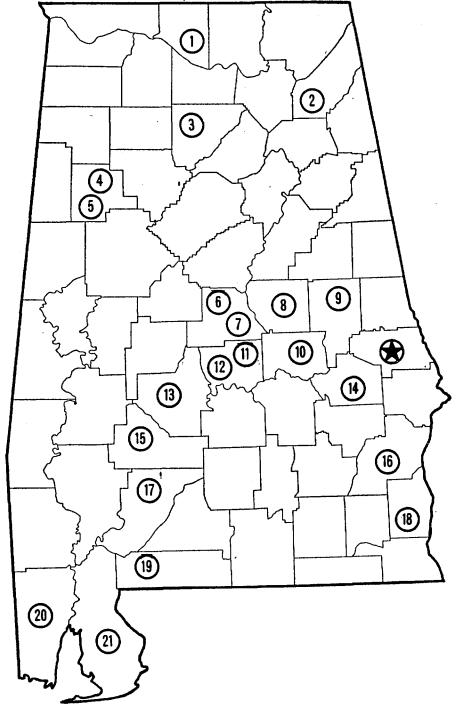
APPENDIX TABLE 11. RESPONSE TO SELECTED COMPARISONS AMONG CANNED, FROZEN, KRAFT CHILLED, AND WHITFIELD CHILLED PEACHES, BY TYPE OF INSTITUTION, MONTGOMERY, ALABAMA, JANUARY, 1968

Type of institution	Response to selected comparisons						
	Commercial to canned	Commercial to fresh	Commercial to frozen	Experimental to canned	Experimental to fresh	Experimental to frozen	Experimental to commercial
Club.....	better	about same	about same	better	about same	about same	better
Club.....	about same	about same	about same	better	about same	better	better
Motel.....	not as good	not as good	about same	better	not as good	better	better
Motel.....	better	not as good	NR ¹	better	about same	NR	NR
Hospital.....	not as good	not as good	not as good	about same	not as good	better	better
Nursing Home.....	better	not as good	NR	better	better	NR	better
Hotel.....	better	not as good	NR	better	not as good	NR	better

¹ No response.

AGRICULTURAL EXPERIMENT STATION SYSTEM OF ALABAMA'S LAND-GRANT UNIVERSITY

With an agricultural research unit in every major soil area, Auburn University serves the needs of field crop, live-stock, forestry, and horticultural producers in each region in Alabama. Every citizen of the State has a stake in this research program, since any advantage from new and more economical ways of producing and handling farm products directly benefits the consuming public.



Research Unit Identification

★ Main Agricultural Experiment Station, Auburn

1. Tennessee Valley Substation, Belle Mina.
2. Sand Mountain Substation, Crossville.
3. North Alabama Horticulture Substation, Cullman.
4. Upper Coastal Plain Substation, Winfield.
5. Forestry Unit, Fayette County.
6. Thorsby Foundation Seed Stocks Farm, Thorsby.
7. Chilton Area Horticulture Substation, Clanton.
8. Forestry Unit, Coosa County.
9. Piedmont Substation, Camp Hill.
10. Plant Breeding Unit, Tallassee.
11. Forestry Unit, Autauga County.
12. Prattville Experiment Field, Prattville.
13. Black Belt Substation, Marion Junction.
14. Tuskegee Experiment Field, Tuskegee.
15. Lower Coastal Plain Substation, Camden.
16. Forestry Unit, Barbour County.
17. Monroeville Experiment Field, Monroeville.
18. Wiregrass Substation, Headland.
19. Brewton Experiment Field, Brewton.
20. Ornamental Horticulture Field Station, Spring Hill.
21. Gulf Coast Substation, Fairhope.