



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*



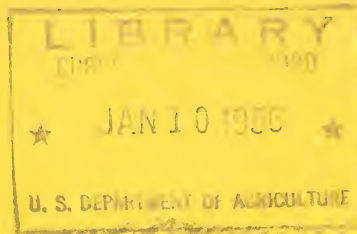


## Historic, archived document

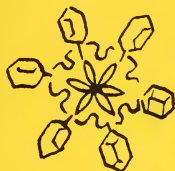
Do not assume content reflects current scientific knowledge, policies, or practices.



Ag 84m  
f.3 WASHINGTON, D. C.

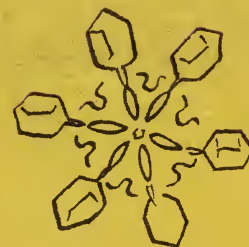


DECEMBER 1955



# FROZEN

# GRAPEFRUIT



# SECTIONS

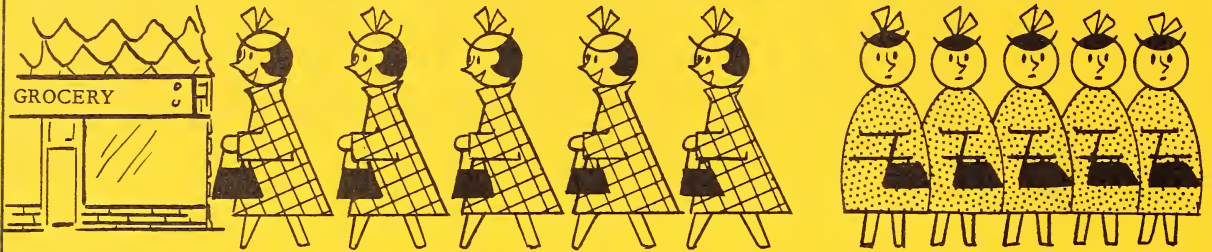


EVALUATING A NEW PRODUCT  
BY RETAIL SALES AUDIT  
AND HOUSEHOLD SURVEY

Marketing Research Report No. 110

UNITED STATES DEPARTMENT OF AGRICULTURE  
Agricultural Marketing Service

# Reactions of Homemakers to Frozen Grapefruit Sections



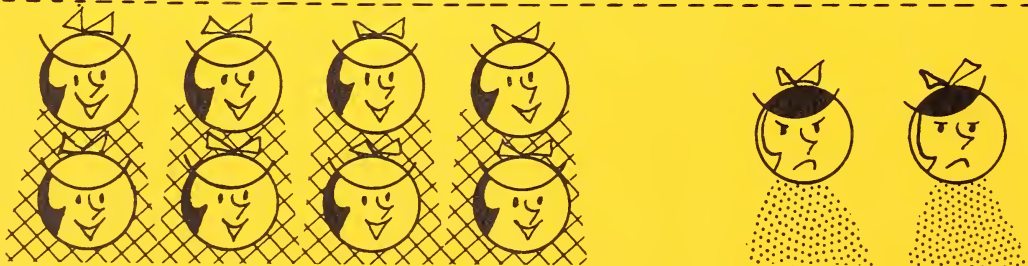
5 out of 10 were aware product was available in stores



2 out of 10 purchased the product



7 out of 10 who bought made repeat purchases



8 out of 10 who bought were satisfied with the taste

## ACKNOWLEDGMENTS

This study was conducted under the general supervision of Shelby A. Robert, Jr., and Trienah Meyers of the Market Development Branch, Agricultural Marketing Service. Hugh P. Bell of the Market Development Branch supervised the field work of the household survey.

Frank Arn and Ralph Henry of the Florida Citrus Commission were directors of the promotional program, and Francis Mulkeen and Robert Vogel managed the promotional work in Erie, Pa.--the location of the test. The Florida Citrus Commission engaged its advertising agency to introduce the product.

Thanks are expressed to the many store owners, executives, and personnel associated with the food stores in Erie, as well as the frozen food distributors. The test would not have been possible without the cooperation of the processors in Florida.

This study was carried out under authority of the Agricultural Marketing Act of 1946.



## CONTENTS

	<u>Page</u>
Highlights of findings -----	1
Background -----	3
Selection of the test city -----	3
Objectives -----	4
Methods and procedure of retail store audit -----	4
The promotion program -----	5
The store sample -----	6
Design of store audit -----	6
Methods and procedures of household survey -----	7
Survey results--retail store audit -----	7
Total sales and sales by brand -----	7
Effect of the promotion campaign -----	8
The second sales promotion -----	9
Do promotions increase total sales -----	11
Sales by type and size of store -----	11
Effect of size of display and size of frozen food department -----	14
Size of display as related to sales -----	15
Relationship to sales of other frozen fruits and juices ----	15
Comparison with sales of canned grapefruit sections -----	17
Comparison with sales of other canned fruits -----	19
Influence on total sales of grapefruit and grapefruit products -----	19
Results of the household survey -----	21
Awareness of frozen grapefruit sections -----	21
Purchases of frozen grapefruit sections -----	23
Initial versus repeat purchases -----	23
Brands purchased -----	25
Opinions of nonusers -----	25
Homemakers' opinions of frozen grapefruit sections -----	26
Ways of serving frozen grapefruit sections -----	29
Frozen grapefruit sections and competing products -----	30
Can size, price, and defrosting -----	30
Conclusions -----	33
Appendix -----	34

For sale by the Superintendent of Documents, U. S. Government Printing  
Office, Washington 25, D. C. Price 40 cents

FROZEN GRAPEFRUIT SECTIONS: EVALUATING A NEW PRODUCT BY  
RETAIL SALES AUDIT AND HOUSEHOLD SURVEY

By Robert E. Branson, Milton Jacobs,  
and Richard Hall

HIGHLIGHTS OF FINDINGS

Retail store audits and a household survey conducted during a market test of canned frozen grapefruit sections in Erie, Pa., August to November 1954, developed the following facts:

FROM RETAIL STORE AUDITS:

Volume of sales for the 11-week test: Almost 1,300 cases of 24 10-ounce cans, or \$4,800 worth of the test product.

Volume of sales during 4-week promotion period: Two-thirds of total sales during test period were made during promotion period.

Volume of sales in demonstration stores during promotion period: Demonstration stores sold 4 times as many cases as comparable non-demonstration stores.

Volume of sales during usual retail store type promotion: Almost 3 times the sales of previous week.

Effect of size of display and size of frozen food department on volume of sales: Larger frozen food departments had almost twice the sales of smaller departments with sales increasing almost in proportion with the number of rows displayed up to a maximum of 4 rows.

Volume of sales of product compared with that of other frozen fruits: Frozen grapefruit sections second only to frozen strawberries through the whole period.

Volume of sales of product compared with that of canned grapefruit sections: About the same number of cases of each were sold.

Influence of introduction of frozen sections on total sales of grapefruit products: Frozen grapefruit sections appeared to add to total demand for grapefruit; substitution among grapefruit products appeared to be relatively small.

FROM HOUSEHOLD SURVEY:

Extent of awareness of availability of frozen grapefruit sections in stores: About half the homemakers interviewed were aware of the new product.

Extent of purchases of frozen grapefruit sections: More than 1 in every 10 homemakers had bought the product.

Ways by which homemakers became aware that the product was available in the stores: Six in 10 became aware of the product through newspaper, radio, or television; 5 in every 10 had seen it in a store, pictured on a poster or a display; about 2 in 10 had learned about it from friends.

Effects of store demonstration on sales: More than 8 in every 10 who witnessed demonstration of the product in the stores claimed that they made initial purchase immediately after.

Uses of frozen grapefruit sections: More than 7 in every 10 homemakers used the product as a breakfast fruit; uses as salad, snack, and dessert were less popular.

Opinions about frozen grapefruit sections: More than 8 in 10 homemakers were satisfied with the taste and were favorably impressed by its natural flavor and freshness. However, a small but significant percentage thought the product was too sweet, and most respondents would have preferred a size larger than the 10-ounce can.

Opinions about price of product: Most consumers reported that price of the frozen grapefruit sections was about right, especially brand B which sold for 14-1/2 cents per 10-ounce can whereas brand A sold for 16-1/2 cents.

## BACKGROUND

Citrus growers in Florida in recent years have been concerned over the generally unsatisfactory prices received for grapefruit. Efforts are being made to increase sales through expanding present markets and developing new markets. One of the important new markets being explored is that for canned frozen grapefruit sections.

Frozen grapefruit sections are not entirely a new product. Some experimental production was undertaken prior to the advent of frozen concentrated orange juice. Earlier marketing attempts were unsuccessful due to a combination of production, packaging, and pricing problems. Economical sectioning of grapefruit for frozen production alone presented a difficult problem. The product was packed with sugar in cardboard cartons, similar to the type used for frozen strawberries. The product was subject to browning when exposed to air, leakage under partial thawing, and "cardboard" flavor. In the earlier marketing attempts, the price ranged from 33 to 14 cents. The latter price prevailed just prior to abandoning production of the product.

In 1954, two large citrus processors in Florida, having conducted further processing research, packed a limited quantity of frozen grapefruit sections. They used only select fruit and packed the sections in 10-ounce cans. Furthermore, a desirable formula of sucrose and other sugars as a carrier and preservative had been developed. With the new pack it was possible to price the product in retail stores from 29 to 33 cents for 2 10-ounce cans. The product appeared to overcome the shortcomings of the earlier pack. To assist the citrus industry in appraising the potential market for this product, a market test was conducted in Erie, Pa., under conditions approximating the usual commercial operations.

The market test was conducted in coordination with (1) an advertising and promotional program carried out by the Florida Citrus Commission, and (2) two surveys by the Department to measure the results of the test, as follows: Weekly audits of sales in retail food stores of the test product and 20 competing items, and a household survey to determine consumer reaction to the test product.

### SELECTION OF THE TEST CITY

Erie, Pa., was selected for the market test because it offered:

- (1) An area of high population density in the major market area for Florida citrus--the Northeast region.
- (2) Effective local advertising and promotion.
  - (a) A city of about 100,000 population.
  - (b) Local newspapers widely read in the city.

- (c) Radio and television audiences served almost exclusively by local stations.
  - (d) Distribution of incomes and occupations reasonably representative of the total urban population of the Northeast region.
- (3) Adequate cold storage and frozen food distribution facilities.
  - (4) Economic conditions reasonably representative of those in the Northeast.

At the time of the market test, economic conditions in Erie were such that any new product faced a rather critical test (table 1, appendix). 1/

### OBJECTIVES

The major objectives of the market test for frozen grapefruit sections were (1) to assist the citrus industry in determining whether commercial processing of the product would be feasible from the standpoint of consumer acceptance and demand, (2) to determine whether the new product represented an addition to total market for grapefruit, or merely substituted for other grapefruit products, and (3) to measure the efficiency of the promotional activities employed in the test--news-paper, radio, and television advertising, and demonstration or sampling of the product in stores. 2/

### METHODS AND PROCEDURE OF RETAIL STORE AUDIT

Newspaper and radio and television station executives of Erie, Pa., were consulted concerning the availability of their facilities for the promotion program to be handled by the Florida Citrus Commission and its advertising agency. Also, meetings were held in the central offices of the chain stores, and affiliated independent stores in order to acquaint officials with the purposes of the test, and to obtain their cooperation. The major independent stores were visited for the same purpose (table 2). In view of the difficulty of visiting all the small independent stores, contact with them was made indirectly through their trade association. It was made certain that no other major market test for a food item was scheduled for the same period.

---

1/ Details of economic conditions and employment in the test city appear in appendix.

2/ The specific objectives of the retail store audits and household survey included in the market test are listed in appendix.

The Promotion Program 3/

The promotion program for frozen grapefruit sections was carried out August 16-September 11, through 5 different media (fig. 1): Newspaper grocery ads and feature items; radio spot announcements; television demonstrations on a home economics program; in-store promotional material with special displays of the product; demonstrations or taste sampling of the product from special displays in 10 stores.

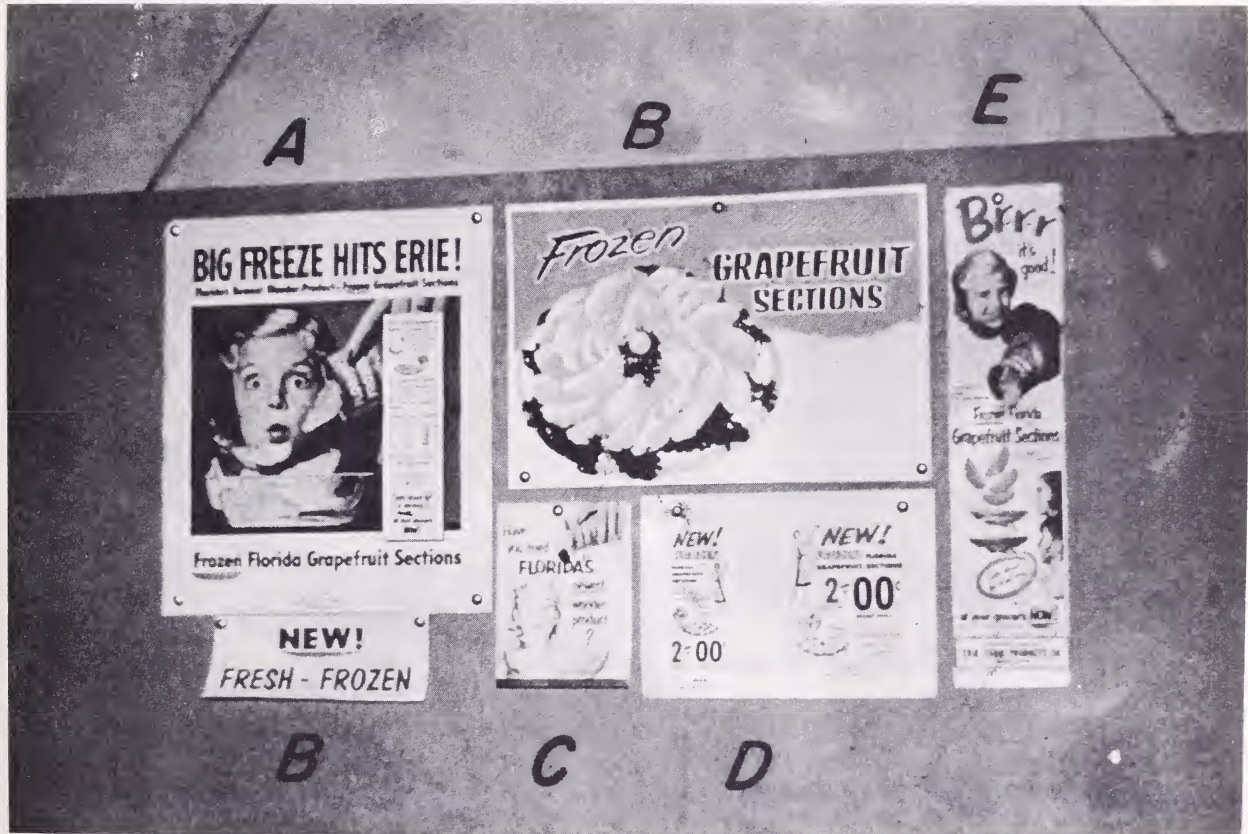


Figure 1.--Display of advertising material used in the promotion program. A, 1,600-line newspaper advertisement; B, selling point cards; C, booklet on use of product; D, insert for grocery store advertising; E, 400-line newspaper advertisement.

3/ Details in appendix.

The Store Sample 4/

Almost all the chain and large or major independent stores were audited during the market test. A rotating sample of small independent stores also were audited to obtain a representative sample of sales in the "corner store" type of retail food outlet. Table 2 lists the number of stores in Erie and the number of stores audited.

Design of Store Audit 5/

It was considered most likely that the paramount uses of the test item would be as a breakfast fruit or for salads. Weekly audits were therefore made on price and sale of the following products:

Frozen fruits:

Grapefruit sections  
Brand A  
Brand B  
Peaches  
Strawberries  
Melon balls  
Pineapple chunks  
Fruit cocktail

Canned fruits:

Grapefruit sections  
Pears  
Peaches  
Apricots  
Fruit cocktail  
Citrus salad

Frozen juices:

Orange concentrate  
Grapefruit concentrate

Canned single-strength juices:

Grapefruit  
Orange  
Blended (orange-grapefruit)  
Tomato

Fresh citrus:

Grapefruit  
California-Arizona  
Florida  
Texas  
Oranges  
California-Arizona  
Florida  
Texas

Weekly audits were made July 19-31, 1954, after which the stores were stocked with the test product. These audits provided a benchmark against which to measure the level of sales in succeeding weeks.

The weekly audits were begun again on August 16, 1954, and continued for 11 weeks to allow time for sales to fall to their normal level after the 4-week promotion campaign instituted on August 19. The second phase of the test--a limited promotion--was undertaken the first week of November in a selected number of stores where sales records were kept for 4 weeks, November 1-27.

---

4/ Details in appendix.

5/ Details in appendix.

## METHODS AND PROCEDURES OF HOUSEHOLD SURVEY

A household survey was begun after the frozen grapefruit sections had been in the Erie food stores for 8 weeks, or 4 weeks after the end of the promotion campaign. This lapse of time allowed for a return to normal following the period of high-pressure promotion. Several purposes were served thereby: Opinions of a number of those homemakers using the product could be based on their experiences with more than one purchase; also, a measurement could be obtained of the amount of repeat purchasing.

Since the incidence of purchase for the entire city was expected to be rather small during the 2 months in which frozen grapefruit sections were on the market, it was necessary to design a sample large enough to yield a significant number of users for a satisfactory test.

The universe to be sampled was all households in Erie, Pa., plus some households in adjacent areas, and a cross-section of the households was to be obtained. Three types of households were included in the sample: (1) Those who used the product within the last 2 months, (2) those who were aware of the product but did not use it, and (3) those who had not heard of the product.

To make up the sample, 117 blocks were randomly selected; in each block, complete enumeration was carried out. The above number of blocks yielded 2,212 dwelling units of which 72 were not eligible for purposes of this study because the major proportion of meals was eaten away from home. Of the remaining eligible dwelling units, 1,837, or 83 percent of the total eligibles, were successfully contacted for interview.

Among the sample households, every user of the product was interviewed. The number of aware-nonusers and of unaware homemakers to be interviewed was predetermined in order to insure reliable statistical analysis. In enumerating the selected blocks in the sample, all aware-nonuser and unaware homemakers contacted were tallied to obtain a true frequency for these two groups. However, a rate was set up to obtain the predetermined number of interviews deemed necessary for these groups. For example, if 800 aware-nonusers had been contacted in the enumeration, 200--or a rate of 1 in 4--actually were interviewed.

### SURVEY RESULTS--RETAIL STORE AUDIT

#### Total Sales and Sales by Brand

Total sales of frozen grapefruit sections in Erie retail food stores amounted to an estimated 1,286 cases (a case containing 24 10-ounce cans) during the 11-week test period from August 16 to October 30 (table 3). The 11-week period comprised the 4-week promotional program and the 7 succeeding weeks. Sales value totaled \$4,788. This represented actually audited sales, except for about 250 cases estimated sold by that proportion of the small independent stores not included in the



store audits. Throughout the survey frequent checks were made to insure that frozen grapefruit sections were being stocked by the stores and displayed where consumers could purchase them.

Some difficulties in size of display, poor location, and failure to reorder were noted. These difficulties were kept to a minimum, however, considering the general struggle for frozen food display space.

Of the total of 1,286 cases of frozen grapefruit sections sold during the 11-week period, 538 cases, or 42 percent, were brand A and the remainder brand B. Both brands were packed in 10-ounce cans. Brand A, however, was packed in a medium syrup, while brand B was packed in only a light sugar. Prices of the 2 also differed somewhat. Brand A retailed at 2 cans for 33 cents, brand B at 2 cans for 29 cents. This price differential was employed because brand A was a widely known brand, and B was almost entirely unknown in the Erie market. During the market test almost all stores in the survey kept the prices unchanged. Consumer reaction to both the price and sweetness of the 2 brands is given in the section on the household survey.

A concerted effort was made to have all stores carry both brands. This was necessary for an adequate check on consumer reaction. These efforts were generally successful. Both brands were available in all of the chain stores excepting 1 or 2 outlets of a local chain. Most of the major independents carried the 2 brands. Many of the smaller independent stores, however, stocked only 1--mostly brand A--because it was an advertised brand. Stores that carried only 1 brand usually did so because their sales volume did not justify handling 2 brands. Many of the small independents kept their frozen foods in ice cream cabinets. Therefore, sales of 1,286 cases of the frozen grapefruit sections during the 11-week test period were not quite so large as ideal conditions would have allowed. On the other hand, better than average availability for a new item was probably achieved.

#### Effect of the Promotion Campaign

The success of the promotional campaign was obvious from the sales results achieved and the degree of consumer awareness of the product. Sales during the 4-week promotion totaled 862 cases--67 percent of the total amount sold in the entire 11 weeks of the first phase of the market test (table 4). Practically the same ratio of sales occurred between the 2 brands during the promotion period as during the total 11-week test--14 cans of brand B to 10 of brand A. Apparently, there was little shifting of purchases among the brands after the promotion campaign. The survey seemed to indicate, however, that householders were not overly aware that 2 brands were on the market.

A large part of the impetus to sales during the 4-week promotion period was provided by demonstrations of the frozen grapefruit sections in 10 of the larger stores. Slightly more than 1 out of 2 cans sold in the promotion period in the demonstration stores were sold at these demonstrations (table 4). Effectiveness of the demonstrations was



displays of the product and including it in their weekly advertising in newspapers. A 300-percent increase in sales of frozen grapefruit sections resulted from this kind of promotion. One hundred cases were sold during the week ending November 6 compared with only about 25 to 30 cases in the same stores the week before (fig. 2).

Valuable information was gained by testing this conventional method of sales promotions; the effectiveness of such an approach was clearly demonstrated. Also, this less expensive type of promotion was shown to be successfully used in conjunction with the more expensive single-product advertising and product demonstration. Furthermore, these store promotions can be used advantageously until wider distribution of the product is attained and national advertising can be efficiently employed. The Florida Citrus Commission has special display cardboard boxes which can be very helpful in this type of program (fig. 3).

#### Do Promotions Increase Total Sales?

The promotion campaigns for frozen and canned grapefruit sections apparently resulted in a large number of impulse sales without disturbing the normal sales rate. The impulse sales created by such promotions will acquaint new customers with the product and enlarge the total market. In view of this potential, consideration might profitably be given by processors to making advertising and promotional allowances available to chain and other stores for the purposes of promoting the product.

Sales of frozen grapefruit sections were approximately the same level both before and after the special store promotion during the week ending November 6 (week No. 14, fig. 2). Also, each of the 4 kinds of promotion resulted in approximately the same level of purchases. No basic difference in the subsequent sales level was observed whether the promotion was by one chain or several.

#### Sales by Type and Size of Store

There was a definite relationship between sales of frozen grapefruit sections and the size and type of retail outlet. Such a relationship was found among both demonstration and nondemonstration stores.

In the 11-week market test period, 65 percent of the total quantity purchased was from chain stores, 14 percent from the larger independent



Figure 3.--Demonstrators standing beside cardboard display case.

stores, and 21 percent from the smaller independents (table 6). Total sales of the larger independents were lower than would be normally expected in most cities because of the unusually small number of such stores in Erie. Therefore, a comparison on the basis of average sales per store is more meaningful. Average chain store sales were 44 cases (24 10-ounce cans) per store for the total 11-week test period, compared with an average of 14 cases for the large independents. The small "corner" independent stores handling frozen foods averaged only about 2 cases for the entire test period. Small independents carrying frozen foods usually sold the sections, frozen orange juice, and 1 or 2 other items out of an ice-cream refrigerated box with "flip-up" lid tops. Thus virtually no display was made of the product in those stores (fig. 4).

The above sales figures by type of store bear out what has been generally observed by store managers and distributors of frozen foods. Most of the frozen food sales are in the chain outlets and the larger independent stores. Actually, a larger proportion of the frozen grapefruit sections sales were in small independent stores than was true for frozen concentrated orange juice. 6/

Size of the stores and of their frozen food departments was a very important factor in sales volume. The chain stores had both a larger business volume and a larger frozen food department. The relationship between frozen grapefruit sections sales and size of store is given in table 7. The average for demonstration and nondemonstration stores is shown separately to eliminate the effect of demonstrations from the comparisons.

Stores with gross weekly sales of between \$25,000 and \$75,000, and in which product demonstrations were given, averaged sales of 105 cases for the 11-week test--an average of 10 cases per store per week. After the initial impetus of the demonstrations was past, sales were approximately 3 to 5 cases per week. Lower sales levels for the smaller demonstration stores are typified by the average of 36 cases during the 11-week test period for 2 stores which had a gross sales volume of between \$5,000 and \$15,000. The average sale in these stores after the promotion campaign was about 2 cases per week.

In nondemonstration check stores, the level of sales started at considerably lower average rates than in comparable demonstration stores. The weekly gross sales volume of the demonstration stores was greater than the weekly gross sales volume of the nondemonstration check stores, resulting in higher level of sales for the entire period. However, the average sales of frozen sections declined more rapidly after promotion in demonstration stores than in nondemonstration check stores. The sales rate in the closing weeks of the market test was not

---

6/ Usually a new product has a smaller proportion of its sales in small stores. In this instance, however, the concerted effort to put the product in all stores overcame this tendency.

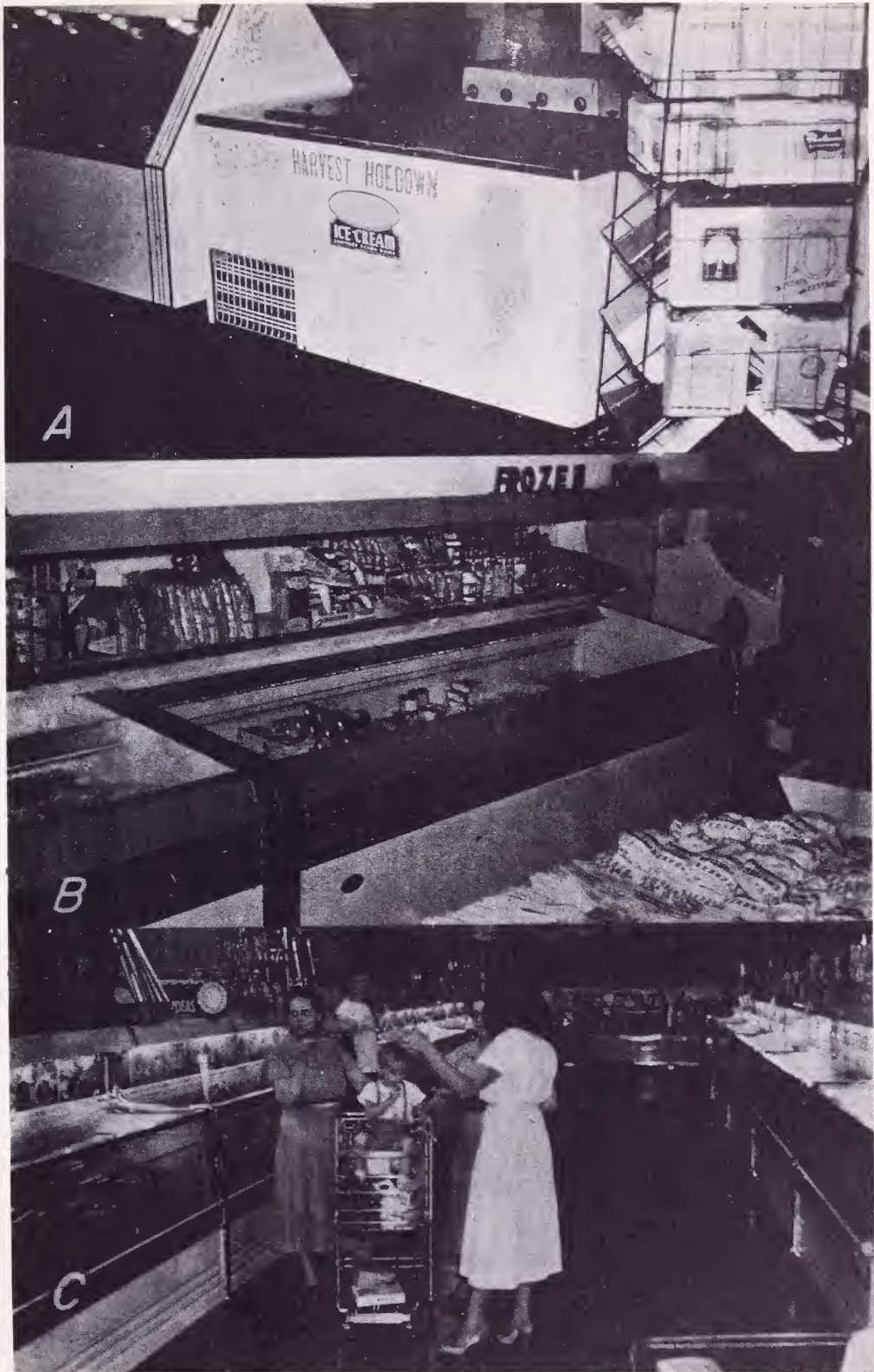


Figure 4.--Frozen food cases in retail stores. A, Ice-cream refrigerated box with "flip-up" lid top. B, Open-top freezer cabinet. C, Modern frozen food department.

significantly different in the 2 groups of stores. Consequently, it must be concluded that after the promotion period the sales of the product in the long-run in demonstration stores and in nondemonstration stores in Erie were about the same. 7/ 8/

#### Effect of Size of Display and Size of Frozen Food Department

There are wide differences in retail frozen food facilities between recently opened or modernized stores and long established retail stores (fig. 4). The result is that the sales of frozen foods vary widely between stores with similar gross weekly sales volume.

The relationship between sales of frozen grapefruit sections and size of frozen food departments, in terms of front footage, in the stores audited in Erie is given in table 8.

In order to show the net effect of the size of the frozen food department, comparisons are given separately for four sales classes of nondemonstration stores. Thus, the effect of sales variations attributable to store business volume or presence of product demonstrations is eliminated. 9/

As is generally the case elsewhere, the larger food stores in Erie had larger frozen food departments than the smaller stores. Nonetheless, the variation from about 13 to 100 feet in front footage in stores with between \$25,000 and \$75,000 gross sales volume was considerable. The larger frozen food departments sold almost twice as many cases of frozen grapefruit sections as the smaller departments. 10/ A similar relationship existed among the stores with a gross weekly sales volume of \$5,000 to \$14,999. Four stores in this sales class with between 13 and 24 feet of freezer cabinet front footage sold more than twice as many cases of frozen grapefruit sections as 5 other stores with only 6 to 12 feet of frontal footage. Although the data are not shown, a corresponding relationship was found for the 10 demonstration stores.

---

7/ There remains, however, as an unknown the extent to which the demonstrations in one set of stores stimulated purchases in other stores in the long run.

8/ The relationship between store business volume and sales of canned (shelf) grapefruit sections was similar to that cited for the frozen grapefruit sections.

9/ Some correlation between sales volume and freezer cabinet space, of course, still can be present when stores are classified into sales class groups.

10/ A strict cause and effect cannot be reasoned between the size of the frozen food department and sales of frozen grapefruit sections. Undoubtedly, some stores would not profit by having more frozen food cabinets. In general, however, it appeared that lack of sufficient equipment was definitely limiting sales in many stores.

It is obvious from the sales results in Erie that in introducing frozen grapefruit sections efforts should be made to place the product first in the larger stores and in those with good frozen food departments. Concentration of distribution in that type of store will be much more successful if backed by a reasonable amount of promotion.

#### Size of Display as Related to Sales

During the course of the weekly auditing of food stores in Erie, it was observed that the amount of frozen grapefruit sections sales appeared to be associated with the number of rows of the product displayed in the frozen food cabinets. Therefore, an analysis of the effect of display size was made (table 9). Again nondemonstration stores are used for this comparison in order to avoid the complicating effects of demonstrations. Because only the larger stores had more than one row of the test product, one-store observations appear more frequently in this than in preceding analyses. The results are therefore considered merely indicative of the basic type of relationship that prevailed.

Sales of frozen grapefruit sections responded in each instance (table 9) to increasing the number of rows displayed. Doubling of the number of rows in most instances more than doubled the sales volume. Eleven cases (24 10-ounce cans per case) were the average sales by the \$5,000-\$14,999 sales class stores having 2 rows of the product displayed. Only about 4 cases were averaged by the same size stores having a 1-row display. Supermarkets (\$25,000-\$75,000 annual sales) without product demonstrations averaged 21 cases per store from a 4-row display during the first 4 weeks of the market test, while a 2-row display netted total sales of only about 13 cases during the same 4-week period.

No special attention was given to display of the product after promotion. Under the usual store operations, the store auditing staff found that the display of the product in stores was in some instances insufficient to maintain the previous sales volume of the store either because the product was not being on display all week or because potential customers were not able to see the product in the freezer cases.

#### Relationship to Sales of Other Frozen Fruits and Juices

Frozen concentrated orange juice and frozen strawberries were the only frozen food products surveyed that exceeded frozen grapefruit section sales during the 11-week market test. The other frozen fruits and juices included in the store audits were frozen peaches, melon balls, pineapple chunks, fruit cocktail, and frozen concentrated grapefruit juice. Data regarding the sales and average prices of these products are given in table 10.



Almost 6 cases of frozen concentrated orange juice to every 1 case of frozen grapefruit sections were sold during the 11-week test period. 11/ Frozen strawberry sales averaged 1.2 cases to each case of frozen sections. On the other hand, 3 cases of the frozen grapefruit sections were sold to each case of frozen concentrated grapefruit juice, although frozen grapefruit juice had heavy store promotion during the entire market test. Ratios of from 8 to 1 up to 12 to 1 were maintained by the frozen grapefruit sections over the other frozen fruits.

Frozen grapefruit sections were slightly lower in price than frozen peaches and were considerably cheaper than the other frozen fruits surveyed. Though consumers' comments revealed that they compared the price of frozen grapefruit sections with those of canned sections and of fresh grapefruit, probably few if any comparisons were made with prices of other frozen fruits.

The price of the 2 frozen concentrated juices--orange and grapefruit--averaged 16.2 cents and 9.9 cents per 6-ounce can respectively. Frozen orange juice was heavily advertised during the entire period. Special prices--either 3 or 4 of the 6-ounce cans 12/ for 25 cents--prevailed for frozen concentrated grapefruit juice throughout the test period. This price for frozen grapefruit juice was understood to be below production and marketing costs.

Figures on sales and average prices of all the surveyed products are given in table 11 in the appendix; included are selected canned single-strength juices, canned fruits, and fresh oranges and grapefruit.

A better appraisal of the relative market potential for frozen grapefruit sections is gained by eliminating the effects of the large sales during the period of the advertising campaign and in-store product demonstrations. Effects of special prices and displays for other products would also have to be eliminated in order to have comparable quantity figures. On this basis, total sales of frozen grapefruit sections in Erie, at the end of the test, amounted to about 42 cases per week, considerably more than those of 3 other relatively new frozen fruits--melon balls, pineapple chunks, and fruit cocktail (table 12). They also exceeded the averages of 9 cases of frozen peaches per week and 12 cases of frozen concentrated grapefruit juice--2 products that have been on the market for several years. Sales of frozen peaches, however, were probably somewhat below the yearly average at the time of the survey, in view of the fact that fresh peaches were available during a part of the market test.

The wide difference in the sales rate of frozen concentrated orange juice--the biggest item in the frozen food field--and those of the frozen fruits is clearly evident from the survey data. Frozen orange

---

11/ Frozen orange juice is packed in cases of 48 6-ounce cans; the frozen grapefruit sections in cases of 24 10-ounce cans.

12/ Some brands were in 5-1/2 ounce-cans.

juice at 580 cases (48 6-ounce cans) per week far exceeded the total of 177 cases (24 10-ounce cans) for all of the frozen fruits combined. Most of these frozen fruit sales were in 12 of the larger food stores.

### Comparison with Sales of Canned Grapefruit Sections

Approximately the same number of cases of both frozen grapefruit sections and canned grapefruit sections were sold during the market test. The size 303 cans of grapefruit sections, total contents about 16-1/2 ounces, had a slightly larger net content of fruit than the 10-ounce can of frozen sections. The market test total of 1,286 cases of frozen grapefruit sections and the 1,370 cases (24 No. 303 cans) of canned (hot pack) sections are reasonably comparable from the purchase rate standpoint during the 11-week test (table 13). Can size did result in a difference in terms of consumer acceptance as well as in the net amount of grapefruit utilized. Indications from the household survey were that consumers probably would have purchased more of the frozen sections had the can size been larger and more comparable in size to the 303 can.

In comparing sales, an important fact was that the frozen grapefruit sections were competing in Erie against the cheaper canned broken grapefruit sections. Separate records were not maintained for the 2 types of canned sections, but it is estimated that at least 4 out of 5 cans sold were the broken product. Select canned whole grapefruit sections retailed at prices from 19 to 21 cents per 303 can during the market test. Broken grapefruit sections were about 14 cents per 303 can. Erie, reportedly, is one of the few cities that has a market for these broken sections. In view of this situation, it seems reasonable to suppose that in cities where broken sections are not available, the sales ratio of frozen to canned sections would be somewhat higher.

The promotional campaign undoubtedly had a beneficial effect on sales of frozen grapefruit sections. Promotional efforts were not restricted to the frozen grapefruit sections. Chain stores advertised special prices on canned broken grapefruit sections during most of September and October. Consumer attention was thus diverted from the frozen grapefruit sections. Unfortunate as this was with respect to the marketing test, opportunity was provided to see the effects of a store promotion on sales of canned sections (fig. 4). Weeks when promotions occurred show definite sales increases.

By adding to figure 5 the sales level for frozen grapefruit sections, it was possible (1) to have some measure of the comparative effect of the promotions and (2) to indicate the relative volume of sales of both forms of grapefruit sections. The decline in consumer purchases of the frozen product might not have been quite so pronounced had the store promotions by the chain organizations not been held for the canned product during September and October. Yet the canned sections promotions by 2 chains during the October 9 weekend did not create any

perceptible shift in consumer purchases of frozen grapefruit sections. Had the 2 products been more equally acceptable to all consumers, more transference of purchases would probably have occurred between the 2 when special promotions were undertaken.

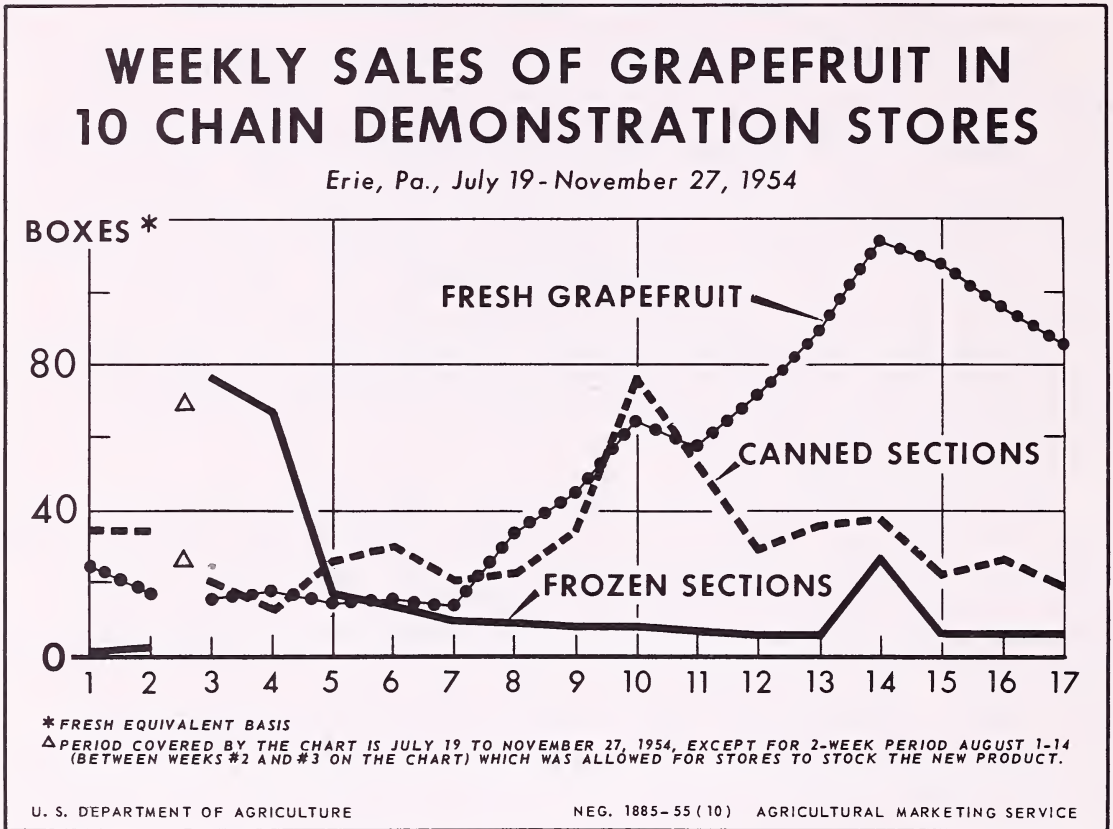


Figure 5

### Comparison with Sales of Other Canned Fruits

Considering that frozen grapefruit sections were unknown to Erie consumers before this test, the amount purchased compared favorably with that of other canned fruits (table 13).

The quantity of the canned fruits sold during the 11-week market test is expressed on the basis of cases of 24 No. 2 cans for comparison purposes. 13/ Sales of 715 cases (24 No. 2 cans) of frozen grapefruit sections substantially exceeded those of citrus salad, 174 cases, and were about equal to those of apricots, 707 cases. Frozen grapefruit sections sales were equivalent to about half the total for canned pears, and were about one-third as large as sales of canned fruit cocktail. Sales of frozen grapefruit sections were about one-fourth those of the largest selling canned fruit, peaches, during the market test. It is important to remember, however, that about half of the sales volume of the frozen grapefruit sections was the result of the demonstration sales during the first 2 weeks of the market test. Sales other than those from the demonstrations were approximately double those of canned citrus salad and about half the amount of canned apricots--2 products that have been on the market for many years.

The household survey indicates that the percentage of homemakers interviewed who used frozen sections for salad making was small compared with the percentage using the product as a breakfast fruit. The pictorial advertising, in-store demonstration, and television demonstration of the product illustrated its use for salads. The market potential for salad making can be exploited in view of the fresh quality and ease of handling of the frozen grapefruit sections.

### Influence on Total Sales of Grapefruit and Grapefruit Products

A major difficulty of any short-run marketing test is the problem of appraising the longer run effects. Although this test was for a considerably longer period than many such studies, it was not long enough to include the problem of seasonality. The test began in August, at which time fresh grapefruit from California-Arizona were in limited supply, and the marketing season for Florida grapefruit had ended. By November, the close of the test, ample supplies of Florida grapefruit from the 1954-55 crop were in all the Erie stores. Fresh grapefruit sales, in response to larger supplies, began to increase within 2 weeks after the close of the frozen grapefruit sections promotion program (fig. 5). As a consequence, no definitive answer can be given concerning the extent of substitution, if any, between frozen grapefruit sections and fresh grapefruit. It is known from the consumer survey that some of those that used the frozen product shifted to fresh fruit when it became available at rather low prices. Chain

---

13/ Although cases of 24 No. 2-1/2 cans is the commonly accepted denominator, the No. 2 can basis was used, since it applies also to the canned single-strength juices.

stores, during the latter half of the market test, were selling fresh grapefruit at 3 for 25 cents. However, when fresh grapefruit were not available, purchases of the frozen were greater in relation to canned sections than the average relationship found in the study. Judging from the relationships shown in figure 5 for the chain demonstration stores, it does not appear that substitution of frozen sections for fresh grapefruit purchases was limiting fresh grapefruit sales. Longer run effects, however, may be more noticeable than for that season of the year as little processing of grapefruit is done early in the season. In order to have good quality fruit, processing grapefruit sections for canning and freezing does not begin until about January.

Insofar as the canned grapefruit sections were concerned, there again appeared to be very little substitution of purchases (fig. 2). About the same volume of purchases occurred in Erie when there was a one-chain store promotion of canned sections during the "check" weekend of July 24 (week No. 1 on fig. 2), before the frozen product was introduced, as resulted during a corresponding promotion the weekend of October 2 (week No. 9 on fig. 2), after the frozen grapefruit sections were introduced. These 2 promotions were by the same chain organization. Furthermore, the general level of canned sections purchases apparently was not affected by either the frozen sections or the seasonally increasing purchases of fresh grapefruit. 14/

Larger sales of frozen grapefruit sections than canned sections in the large independent stores were indicated also by the audit survey (tables 14 and 15). Even on a fresh fruit equivalent basis, as shown in table 15, sales of frozen sections were larger. 15/ The equivalent of 7 boxes of grapefruit were sold as frozen sections for each 4 boxes sold as canned sections in these stores. Among these stores without demonstrations, the ratio was 4 to 3 in favor of the frozen grapefruit sections, though on a dollar basis (table 14), it was nearer 2 to 1 for the frozen sections.

Influences of the special-price sales on sales of canned broken grapefruit sections are evident in the sales figures for the chain stores. Those chain stores without demonstrations sold the equivalent of about 3 boxes of grapefruit as canned sections to 1 box as frozen sections. However, in terms of dollar sales, the ratio was only 2 to 1. The low prices on the canned broken sections were probably more attractive than usual because of the economic conditions in Erie at the time of the market test. (Appendix.)

---

14/ Managers of some of the larger independent stores, however, reported that sales of the frozen sections reduced the canned item sales appreciably. These instances may involve discriminating customers in the higher income level.

15/ It takes more of the smaller 10-ounce cans of frozen grapefruit sections to equal a box of fresh grapefruit than of the 303 cans of grapefruit sections.

Comparisons between the sales of frozen grapefruit sections, by type of store, and sales of other grapefruit products are shown in tables 14 and 15. Allowing for the fact that the frozen sections are a new product, sales compared favorably with those of canned single-strength grapefruit juice--the most important processed grapefruit product at present in terms of the amount of fruit utilized.

Chain stores where demonstrations were held sold 1 box of grapefruit in the form of frozen sections to 2 boxes as single-strength grapefruit juice. Those stores without demonstrations had a ratio of about 1 box as frozen sections to 4 boxes as canned single-strength juice. The ratio was considerably more favorable to the frozen sections in the major independent stores. 16/

On the basis of the survey, it appears that there is a market for frozen grapefruit sections. The ultimate size of the market will depend on the merchandising policies and promotions pursued and the pricing of the product. Considering the grapefruit market as a whole, the test also indicates that development of the market for frozen grapefruit sections will probably expand total sales and consumption of grapefruit and grapefruit products. Demand will be expanded because, by and large, a new group of users are brought into the market, and the product permits consumers to use higher quality grapefruit over a longer period of time during the year, and it is made available in a more convenient form.

## RESULTS OF THE HOUSEHOLD SURVEY

A cross-section survey in Erie, after the promotion campaign, showed that 16 percent of the consumers used frozen grapefruit sections, 34 percent were aware of the product but did not use it, and 50 percent were unaware of the product.

### Awareness of Frozen Grapefruit Sections

In introducing this new product, a rather intensive advertising and promotional campaign was carried on in Erie. Some homemakers learned about this product from only one source, though a number of them were exposed to several kinds of promotion. As might be expected, more than 6 in every 10 homemakers aware of the availability of frozen grapefruit sections had been exposed to advertising through newspaper, radio, or television. Of those who were aware of the new product, 5 in 10 responded that they had seen it in the stores; this could mean that they had seen a store display, a sign, or the actual product in the foodcase. Almost 3 in every 10 aware homemakers said they they had seen the product being demonstrated in the store. Almost 2 in

---

16/ Corresponding tables on orange products, tables 16 and 17, may be found in the appendix.

every 10 homemakers stated that they learned about frozen grapefruit sections from friends telling them about it.

The fact that approximately 50 percent of the homemakers in Erie and vicinity were aware of this new product seems to point to successful advertising and promotion. This is especially true if we compare this incidence of awareness with that in two similar experiments, where awareness of a new product after promotion was approximately 31 percent in one city, and 25 percent in another. 17/

In Erie, being aware of frozen grapefruit sections seemed to be positively related to age, income, and education. That is, more homemakers in the older age groups seemed to be aware of the product than homemakers 30 years of age and younger. Similarly, more homemakers with high school and college education were aware of it than homemakers with less education. Also, there were more aware homemakers in the middle and upper income groups than in the lower income group (table 18).

Because the major emphasis of the study was on consumer acceptance of the product, very few questions were asked about media and the resultant data cannot be regarded as conclusive.

---

17/ The higher degree of awareness was achieved in Tyler, Tex.; the other in Modesto, Calif. New Concentrated Apple Juice: Its Appeal to Consumers, U. S. Dept. Agr., Bur. Agr. Econ., Nov. 1951.

Purchases of Frozen Grapefruit Sections

Approximately 16 percent of the homemakers in Erie had purchased frozen grapefruit sections prior to the household survey. As in the case of awareness, the act of purchasing this new product was positively related to age, education, and income of the homemakers. That is, more homemakers in the 31 and older age groups purchased the product than homemakers 30 years of age and younger; more homemakers with high school and college education were purchasers than homemakers with less education; the middle and upper income groups also showed more purchasers than the lower income group (table 19).

Initial Versus Repeat Purchases

Number of times frozen grapefruit sections were purchased:

<u>Replies</u>	<u>Percent</u>
Once -----	31
Twice -----	20
Three times -----	17
Four times or more -----	<u>32</u>
Total	100

Number of homemakers in sample ----- 272

It was particularly important to determine the extent of repeat purchasing, since store sales can be misleading in a comparatively short market test. Continued sales may represent new buyers trying the product rather than repeat purchases of a satisfied group of customers. The survey in Erie showed that frozen grapefruit sections were a successful product in that a majority of consumers came back for more.

Homemakers who had purchased the product only one time were also asked to give reasons why they had not bought it again. Of this group, 24 percent just did not like it and gave no specific reasons for not liking it; 16 percent responded that they "forgot, just didn't get around to it"; 10 percent did not like the taste; and 10 percent found it too expensive. Other reasons reported by smaller groups for only buying once were: 6 percent preferred fresh fruits; 5 percent did not see it in the stores; and 5 percent had enough frozen grapefruit sections on hand. It seems that about 74 percent of those who bought only once were dissatisfied enough to be an unlikely potential market. However, the remaining 26 percent might be coaxed back to purchase.



Homemakers' reasons for buying frozen grapefruit sections only once:

<u>Reasons</u>	<u>Percent</u> <u>1/</u>
Dislikes for frozen grapefruit sections:	
Just don't like it -----	24
Too expensive -----	10
Didn't like taste -----	10
Didn't like texture -----	4
Inconvenient to keep -----	4
Didn't like size -----	1
Preference for other products:	
Prefer fresh fruits -----	6
Prefer other juices -----	3
Prefer canned grapefruit sections -----	1
Other reasons:	
Forgot, just didn't get around to it -----	16
Didn't see it in stores -----	5
Have enough frozen grapefruit sections on hand -----	5
Don't like frozen foods -----	2
Don't like fruits -----	1
Have canned grapefruit sections on hand -----	1
Just bought it to compare -----	1
Just bought first can the other day -----	1
Miscellaneous -----	4
Don't know, not ascertained -----	6
Number of homemakers -----	83

---

1/ Percentages add to more than 100 because some homemakers mentioned more than 1 reason.

Store demonstrations showed a marked relationship to purchases of frozen grapefruit sections. Of the 120 homemakers interviewed who had witnessed store demonstrations, 86 percent made their initial purchases at the demonstrations, 12 percent did not make an initial purchase at a demonstration, and 2 percent either did not know or the information was not ascertained.

Brands Purchased

Of the two brands of frozen grapefruit sections available to the consumers in Erie, brand B (in light syrup) was purchased by approximately 37 percent of the users, brand A (in heavy syrup) by approximately 24 percent. Approximately 15 percent had purchased both brands. About 24 percent of the users did not recall the brand of the product they had purchased.

Opinions of Nonusers

One of the major objectives was to ascertain why some aware home-makers did not purchase the product at all. When they were questioned, about 25 percent of these aware-nonusers responded they "just hadn't gotten around to it"; 17 percent responded "don't like grapefruit"; and 13 percent responded that they "prefer fresh grapefruit." Only 6 percent of the nonusers said they thought the price "too high"; 5 percent had other fruit or juice on hand, and 5 percent gave health reasons for not buying. In terms of future promotion, those who said "just haven't gotten around to it" and "had other fruit or juices on hand" might still be considered potential customers for the product.

Replies to the question, "How does it happen that you did not buy any frozen grapefruit sections?":

<u>Replies</u>	<u>Percent</u> <u>1/</u>
<u>Dislikes for grapefruit:</u>	
Don't like grapefruit -----	17
Don't like taste of grapefruit--too bitter -----	4
Don't like taste of grapefruit--too sour -----	3
Don't like taste of grapefruit--it is acid -----	<u>2/</u>
Don't like taste of grapefruit--general -----	<u>2/</u>
<u>Dislikes for frozen grapefruit sections:</u>	
Too expensive -----	6
Health reasons -----	5
Don't like frozen grapefruit sections--general -----	1
Don't like frozen grapefruit sections--bitter -----	<u>2/</u>
Frozen grapefruit sections have artificial coloring -----	<u>2/</u>
Can is too small -----	<u>2/</u>
<u>Dislikes for canned grapefruit sections:</u>	
Don't like canned grapefruit sections -----	1
Don't like canned grapefruit sections--bitter -----	<u>2/</u>
<u>Other dislikes:</u>	
Don't like frozen fruits or foods -----	3
Don't like fruits -----	1
Don't like new things -----	1
Don't like canned citrus fruits -----	<u>2/</u>

<u>Replies</u>	<u>Percent</u> <u>1/</u>
Preference for other products:	
Prefer fresh grapefruit -----	13
Prefer fresh fruits -----	2
Prefer canned grapefruit sections -----	2
Prefer juices -----	2
Prefer unsweetened grapefruit -----	1
Prefer oranges -----	1
Prefer other fruits -----	<u>2/</u>
Other reasons:	
Just haven't gotten around to it -----	25
Had other fruits or juices on hand -----	5
Not available in store -----	4
Have no freezer, not enough space in freezer -----	3
Eat most meals out -----	1
Miscellaneous -----	2
Don't know, not ascertained -----	4
Number of homemakers aware of product, but who did not purchase it -----	212

---

1/ Percentages total to more than 100 because some respondents gave more than 1 reason.

2/ Less than one-half of 1 percent.

#### Homemakers' Opinions of Frozen Grapefruit Sections

The homemakers who used the product were asked what they thought about the taste. More than 8 in 10 users responded that they were satisfied with the taste without reference to which brand was used (table 20). If the brand is considered, brand B (packed in light syrup) seemed to elicit slightly more taste satisfaction than brand A (packed in heavy syrup). (Table 20.)

Specific reasons why the taste of frozen grapefruit sections (without reference to specific brands) was judged satisfactory mostly concerned factors such as "tastes like fresh, retains natural flavor." About 17 percent of the users who liked the taste said that the product was "put up with sugar," that it was "sweet." An additional 15 percent stated that the product was "not too sweet or sour, just sweet enough."

Replies to the question, "What was it that you liked about the taste of frozen grapefruit sections? What was it that you disliked?"

Homemakers who used frozen  
grapefruit sections

Replies

Percent 1/

Likes:

Tastes like fresh; retains natural flavor -----	53
Sweet, put up with sugar -----	17
Not too sweet or sour, just sweet enough -----	15
Not bitter -----	6
Good taste (unspecified) -----	6
Tastes fresher than canned sections -----	2
Tastes better than canned sections -----	2
Tangy -----	2
Crisp -----	2
Doesn't taste like can; doesn't taste tinny -----	2
Tart -----	1
Juicy -----	1
Tastes better than fresh -----	1
Not sour -----	1
Not acid -----	1

Dislikes:

Artificial, not natural tasting; doesn't taste like fresh -----	4
Too sweet -----	3
Bitter -----	3
Tastes like canned sections -----	2
Too sour -----	1
Not sweet enough -----	1
Do not like any frozen food -----	1

Miscellaneous likes -----	3
Miscellaneous dislikes -----	2
Not ascertained, don't know -----	3
Number of homemakers -----	272

---

1/ Percentages add to more than 100 because some homemakers gave more than 1 reason.

Replies to the questions, "Other than taste, what were the things you liked about frozen grapefruit sections? What were the things that you disliked?":

Homemakers who used frozen  
grapefruit sections

Replies Percent 1/

Attributes liked:

Texture

Sections firm, whole, full, nice size ---	22
Not mushy -----	1
Tender -----	1

Convenience

Easy to serve, handy, no cutting, quick to prepare, saves time -----	69
Convenient--general -----	14
Convenient to keep, to store -----	4
No strings, no seeds, no white sections -	3
No waste -----	2
Versatility of use -----	1
Packaging, canned -----	1
Year around availability -----	1
Fact of being frozen -----	2/

Size

Good size can -----	2/
---------------------	----

Other

Looks good -----	1
Good price, economical -----	1
Miscellaneous likes -----	1

Attributes disliked:

Texture

Soft -----	1
Mushy -----	1
Not tender -----	1
Stringy, pithy -----	1
Not good if stands a while -----	2/
Sections fall apart -----	2/
Doesn't like frozen foods, general -----	2/

Convenience

Waiting for it to thaw out -----	3
Still icy after defrosting -----	2/

Size

Don't like size--need it larger -----	1
---------------------------------------	---

Other

Too expensive -----	2
Prefer fresh grapefruit -----	2/
Miscellaneous dislikes -----	1
Not ascertained, don't know -----	2

Number of homemakers

272

1/ Percentages add to more than 100 because some homemakers gave more than 1 characteristic.

2/ Less than one-half of 1 percent.

As for the negative factors of taste, 4 percent of the users referred to attributes such as "artificial, not natural tasting, doesn't taste like fresh." About 3 percent said the product was "too sweet"; 3 percent that it was "bitter."

An examination of taste attributes by brand showed that a greater proportion of users of brand B than those of brand A thought the sections tasted like fresh grapefruit or that they retained the natural flavor. Both users of brand A and of brand B responded at about the same percentage as to the products being "just sweet enough." Again, this points to the fact that "just sweet enough" was a subjective judgment, since it is known that the two brands differed in the types of syrup used (table 21). Eleven percent of the users of brand A objected to the product as being "too sweet" while no user of brand B made such an objection.

When asked for attributes liked and disliked about the product other than taste, the homemakers were favorably impressed with the convenience of the product, with its texture in that the "sections were firm, whole, full, and a nice size." No single negative attribute was given by more than 3 percent of the users. An examination of these attributes according to brand appears in table 22 in the appendix.

#### Ways of Serving Frozen Grapefruit Sections

The homemakers were asked how they served frozen grapefruit sections. A large majority of the users, about 86 percent, used the sections at breakfast; 24 percent used the sections as a salad; 15 percent as a snack; 14 percent as a dessert.

In order to judge whether frozen grapefruit sections took the place of other forms of grapefruit, or whether it replaced other items, users were asked what they usually served for breakfast, salads, snacks, and desserts.

As a breakfast food, the frozen grapefruit sections replaced:

Orange juice  
Unspecified juices  
Fresh grapefruit  
Unspecified fruits

As a salad, items which the frozen grapefruit replaced were:

Unspecified fresh fruits  
Canned grapefruit sections  
Fresh pineapple  
Fresh pears

As a snack, the frozen grapefruit sections replaced:

Unspecified fresh fruits  
Fresh apples  
Pies, cakes, cookies  
Fresh oranges

As a dessert, this product replaced:

Unspecified fresh fruits  
Gelatine, pudding, ice cream  
Pies, cakes, cookies

For all uses, many additional items were reported--but in relatively small percentages (table 23).

### Frozen Grapefruit Sections and Competing Products

When considering consumers' acceptance of frozen grapefruit sections, it was also important to know something about other citrus fruit products used previous to the interview. There were two factors to explore: (1) the use of citrus products in general, and (2) the use of grapefruit products--either fresh, canned sections, or juices.

Comparisons were made between the aware-user group and the aware-nonuser group for the 2 months before the interview. A higher proportion of the aware group were users rather than nonusers of frozen orange juice, canned grapefruit sections, and frozen grapefruit concentrate.

The aware-nonusers of frozen grapefruit sections showed a greater percentage of users of canned orange juice than the user group. Of the other citrus products, both groups appeared to have about the same number of users in the 2 months before the interview.

It appears that the users of frozen grapefruit sections are more likely to be users of grapefruit in canned forms than are the aware-nonusers. Both groups seem to show the same percentage of users of fresh grapefruit in the 2-month period under study.

As far as citrus use generally is concerned, the two groups are not very different (table 24).

### Can Size, Price, and Defrosting

In addition to attributes such as taste, texture, and convenience, which the consumer discussed voluntarily, there were factors about which they were specifically asked. With respect to can size, most homemakers reported that they obtained 3 servings from 1 can of the product. The

labels on both brands carried the statement that 3 or 4 servings could be obtained (table 25).

Of the 96 homemakers who did not consider this a good size can, 98 percent preferred a larger can, 1 percent a smaller, and 1 percent either did not know or the answer was not ascertained.

Average servings per can reported by homemakers:

<u>Servings</u>	<u>Percent</u>
One -----	1
Two -----	25
Three -----	47
Four -----	20
Five or more -----	3
Don't know, not ascertained -----	<u>4</u>
Total	100

Number of homemakers who used frozen grapefruit sections --- 272

About 65 percent of the homemakers stated that the can was a good size for their families.

Replies to the question, "Is this a good size for your family?":

<u>Replies</u>	<u>Percent</u>
Yes -----	65
No -----	<u>35</u>
Total	100

Number of homemakers who used frozen grapefruit sections --- 272

When responses to the question, "Is this a good size for your family?" were compared with family sizes, dissatisfaction increased with family size--35 percent of the families of 3 or 4 persons, and 68 percent of the families of 5 or more were dissatisfied with can size of frozen grapefruit sections for their families (table 26).

Since there was a price difference between brand A and brand B, the homemakers were asked for their opinions about the price of the brand which they purchased and also the price which they paid. The number of homemakers who remembered the price of brand A was so small that a statistical comparison regarding attitudes toward price by brand was not possible. However, the majority of homemakers who had used brand B were satisfied with its price.



Inasmuch as improper handling in the home might affect acceptance, homemakers were asked how they defrosted the product. Regardless of defrosting technique, almost all (93 percent) of the respondents were satisfied with the texture of the product after defrosting. The method of defrosting did not seem to have any effect on its acceptability.

Although 74 percent of the users of brand A did not follow the instructions on the can, almost all were satisfied with texture after defrosting. Ninety-three percent of the users of brand B did not follow instructions, but they, too, were almost all satisfied after defrosting (tables 27 and 28).

Replies to the question, "How did you defrost your frozen grapefruit sections?":

<u>Method</u>	<u>Homemakers who used frozen grapefruit sections</u>
	<u>Percent</u>
Of those who used brand A:	
Followed instructions -----	12
Did not follow instructions -----	18
Of those who used brand B:	
Followed instructions -----	3
Did not follow instructions -----	35
Did not know which brand they used, but did not follow instructions -----	30
Don't know; not ascertained -----	2
Total	<u>100</u>
Number of homemakers -----	272

For users in general, 83 percent did not follow the defrosting instructions on the can. Those using brand B seemed more likely to violate instructions than those using brand A.

Replies to the question, "Was the texture of your frozen grapefruit sections satisfactory after defrosting?":

<u>Replies</u>	<u>Homemakers who used frozen grapefruit sections</u>
	<u>Percent</u>
Texture satisfactory -----	93
Texture not satisfactory -----	5
Don't know; not ascertained -----	2
Total	<u>100</u>
Number of homemakers -----	272

## CONCLUSIONS

Both the favorable consumer reaction to canned frozen grapefruit sections and its sales in relation to competing products suggest that canned frozen grapefruit sections have good commercial marketing possibilities, particularly with a reasonable amount of promotion. After the initial period of promotion in the test, sales of the product were second only to those of strawberries among the frozen fruits and compared favorably with canned (shelf-pack) grapefruit sections.

The retail store audits and household survey did not indicate any appreciable amount of substitution for competing products due to the use of the test product. Promotion of the competing products included in the retail store audits, particularly promotion of canned (shelf-pack) grapefruit sections, tended to obscure substitution effects in the store data and also made for more difficult conditions to attain maximum sales of the test product. It appears, however, that canned frozen grapefruit sections can increase the size of the market for grapefruit, although not to the extent of the total sales of the new product.

The ways in which householders became aware of the product and the volume of sales of the product during promotion periods suggest that in-store demonstrations were successful in obtaining high initial sales of the product.

Newspaper advertising and special displays of the product have a less prominent immediate effect on sales, but the indications, based on sales experience following the initial 4-week promotion for stores with and without in-store demonstrations, are that the long-run effect of newspaper advertising and special display is not significantly different from such promotion accompanied by in-store demonstrations. In Erie, more people interviewed became aware of the new product through television than radio. In-store advertising materials were important contributing factors in attaining the degree of awareness of the new product.

APPENDIX

Economic Conditions in Test City

The distribution of labor in the Erie metropolitan area is shown in the table below:

Table 1.--Labor employed in Erie, Pa. 1/

Type of employment	Total employed	
	<u>Number</u>	<u>Percent</u>
Agriculture-----	4,094	5
Construction-----	3,621	4
Manufacturing-----	39,883	46
Durables-----	32,852	38
Wholesale and retail-----	14,688	17
Professional-----	6,481	7
Personal services-----	3,299	4
(Not itemized)-----	14,155	17
<b>Total</b>	<b>86,221</b>	<b>100</b>

1/ Population Census, 1950, U. S. Summary, p. 153.

The above distribution of the labor employed in Erie indicates the importance of durable goods manufacturing to the economy of metropolitan Erie. It appears that in Erie, a slightly larger proportion of the labor force was employed in durable goods manufacturing than the average metropolitan area in the Northeast region.

Unemployment in Erie was somewhat above average for the Northeast region at the time of the market test. Estimates from the Pennsylvania Employment Service indicated that between 10 and 12 percent of the labor force in metropolitan Erie was unemployed. About this time, the average was 8 percent for northeastern cities.

Added to the actual unemployment was the uncertainty of others as to how long jobs would last. One of the large manufacturing plants in Erie reduced employment by moving a division to another State. The general economic conditions, therefore, were not particularly favorable for market testing.

Specific Objectives of Retail Store Audits and Household Survey

The specific objectives of the retail store audits were to:

1. Determine total sales of the test product and sales by brand.
2. Relate advertising program to sales.
3. Determine the sales of test product according to size and type of store.
4. Relate sales of test product to over-all front footage of the frozen food department and to size of display.
5. Compare sales of frozen grapefruit sections with sales of: Other commercially produced frozen fruits and fruit juices, canned grapefruit sections, other canned fruits, and other commercially produced grapefruit products.

The specific objectives of the household survey were to determine:

1. The proportion of homemakers in Erie who were aware that frozen grapefruit sections were on the market.
2. How or through what means homemakers learned that the product was available.
3. The proportion of homemakers who made initial purchases and repeat purchases of frozen grapefruit sections during the 2-month period. (Two or more purchases constituted a repeat purchase.)
4. Among those making initial purchases but no repeat purchases, reasons for not making subsequent purchases.
5. Whether initial purchase was made at time of demonstration.
6. Among those aware of the product but not purchasing it, reasons for not buying.
7. Attributes liked and/or disliked about the product.
8. Specific uses made of frozen grapefruit sections and what other product was ordinarily used for such purposes.
9. The use made of competing citrus products during the 2-month period.
10. The number of servings per can and the homemaker's evaluation of the adequacy of the size of can.

11. Homemakers' opinions about price of the product.
12. The manner in which the product was defrosted and satisfaction with texture after defrosting.

Promotion Program of the Florida Citrus Commission

Five different media were utilized as follows:

1. Newspaper advertising

Ads of 1,600 lines (approximately 11-1/2 x 13-1/2 inches) were carried in the 2 local newspapers on Thursday of the week opening the promotion campaign.

Ads of 400 lines (approximately 3-1/2 x 14 inches) followed on Thursday for 3 successive weeks. Thursday was the principal day for major food store advertisements in Erie. (Picture on page 5.)

2. Radio advertising

One-minute spot announcements from August 16 through September 10.

Type of station

Time of spots

Local - non-network outlet ----- 8:00 a.m. & 12:30 p.m. Wednesdays  
12:30 p.m. Thursdays

Local - network outlet ----- 8:00 a.m. Mondays  
8:15 a.m. Tuesdays  
8:15 a.m. & 11:15 a.m. Fridays

3. Television

The test product was demonstrated and advertised, along with suggested recipes, on a local station's home economics program. The program is presented twice weekly from a demonstration kitchen at its studios. This was one of the few locally produced programs and had a wide audience in Erie.

4. In-store promotion display material

This material included price cards, pictorial cards illustrating the use of the product in a salad, paper pamphlets on uses of the product, and copies of the picture ad appearing in the newspapers. Display material was supplied to all stores handling the product.

5. Demonstrations or taste-sampling of the product

In a selected group of chain and major independent stores, special displays of the test product attended by women demonstrators were installed

on Thursday afternoon, Fridays, and Saturdays of the first 2 weeks of the promotional campaign. The demonstrator and her special display were located in or near the frozen food department in most instances. Though all customers in the stores on those days did not pass the display and sample the product, it was available to the majority of the customers.

### Retail Store Sample

The retail store audits of sales of frozen grapefruit sections were on a city-wide basis.

The stores were divided into three basic groups:

1. Chain stores, both national, regional, and local
2. Major (larger) independent stores
3. Small independent stores

All of the chain store units in Erie were included in the test.

Practically all of the major (large) independent stores were included. A few stores for special reasons were unable to cooperate.

Coverage of every small "corner grocery store" would have entailed so large an expense that a sampling procedure was developed. A total of 120 of these small stores were covered on a rotating or traveling sampling design. Records were kept for 20 stores a week with 10 stores being dropped after the first week and 10 new ones added each week during the 11-week test. The stores were selected on a probability sample basis from available retail store route listings kept up to date by one of the local newspapers.

### Design of Store Audit

Store audit sales records were kept weekly on an individual store basis. Inventories, including display stock, were taken at the first of each week (some on Mondays and others on Tuesdays). Records of deliveries received since the preceding inventory were also kept. Prices were obtained on Friday or Saturday mornings of the survey items in order to record weekend price specials which influenced sales volume considerably.

Selection of the items included with the test product in the store audits was based upon their competitive position with frozen grapefruit sections. Other possible items were eliminated to avoid added cost and to hold the number of products to a feasible limit.

The 21 items audited required a rather large schedule in order to record products by brand, can size, and price in the case of frozen and

processed fruits and juices, and size and State of origin in the case of fresh citrus. A sample page of the store schedule is shown below with hypothetical information recorded. Information on product, price, and net sales can be taken directly from the store schedules by coding the product under column 1. Conversion of price and net sales by can size to a standard unit can be handled by IBM multiplication.

CANNED SINGLE-STRENGTH JUICES

Item	Can or : Number :	package:cans or : Price :	Store display stock :	Stockroom or :		Losses :	Pur-: Net :	cases : sales :						
				warehouse stock :	Net :									
	size : packages: can :	and : per : or :	Net change :	Begin : End :	Begin : End :	Change :								
	brand : case :	package: Begin : End :	Net change :	Begin : End :	Begin : End :	Change :								
		Cents	Cans	Cans	Cases	Cases	Cans	Cases						
Grape- fruit	No. 3 cylinder (46 ozs.)													
	:Brand X	12	31.0	26	20	6	-.50	2	1	-1	0	0	0	1.50
	:Brand Y	12	30.0	15	20	5	.42	0	1	1	0	0	2	.58
	No. 2 can													
	:Brand Y	24	16.0	15	9	6	-.25	1	2	1	1	.04	1	.21
	:Brand Z	24	17.5	15	15	0	.00	2	1	-1	24	1.00	0	.00
	Other (State size)													
(1)														(3)



Retail Store Audit Data

Table 2.--Number of retail food stores in Erie, Pa., according to survey classification, and number audited during the market test

Type of store	Number of stores			
	Total in Erie <u>1/</u>		Audited	
	<u>Number</u>	<u>Percent of total</u>	<u>Number</u>	<u>Percent of indicated type</u>
Chain	19	6	19	100
Major independent	15	4	13	87
Other independent	307	90	120	39
Total	341	100	152	44

1/ According to retail food store route listing of the Erie Times.

Table 3.--Sales of frozen grapefruit sections, in demonstration and nondemonstration stores, by brand and type of store, Erie, Pa., August 16 to October 30, 1954 <sup>1/</sup>

Type of store	Brand A			Brand B			Total <sup>2/</sup>		
	No. of stores	Quantity	Value	No. of stores	Quantity	Value	No. of stores	Quantity	Value
		Cases <sup>3/</sup>	Dollars		Cases <sup>3/</sup>	Dollars		Cases <sup>3/</sup>	Dollars
<b>Chain</b>									
Demonstration	8	233	922	8	353	1,231	8	586	2,153
Nondemonstration	<sup>4/</sup> 7	73	291	<sup>4/8</sup>	125	441	8	199	732
Other	<sup>4/</sup> 2	13	51	3	38	133	3	51	184
Total <sup>2/</sup>	17	319	1,264	19	516	1,805	19	836	3,070
<b>Large independent</b>									
Demonstration	<sup>5/</sup> 2	42	165	2	31	108	2	73	372
Nondemonstration	<sup>4/</sup> 1	4	17	2	25	87	2	29	104
Other	<sup>6/</sup> 7	38	150	<sup>6/7</sup>	40	141	9	78	291
Total <sup>2/</sup>	10	84	332	11	96	336	13	180	668
<b>Small independent</b>									
X (15) <sup>7/</sup>	-	135	566	-	135	484	307	270	1,050
Grand total <sup>2/</sup>		538	2,162		747	2,625		1,286	4,788

<sup>1/</sup> Eleven-week market test including 4-week promotion period.

<sup>2/</sup> Totals may be slightly inexact as figures were rounded.

<sup>3/</sup> Cases of 24 10-ounce cans.

<sup>4/</sup> One store dropped the brand after promotion period.

<sup>5/</sup> Brand not in stock in one store for full period.

<sup>6/</sup> Two stores did not carry this brand for most of period.

<sup>7/</sup> Calculations made by multiplying weekly sample of 120 stores by 15 to equal total number of such stores in city.

Table 4.--Promotion-period sales of frozen grapefruit sections in demonstration and nondemonstration stores, by brand and type of store, Erie, Pa. 1/

Type of store	Sales							
	Brand A				Brand B			
	No. of stores	Quantity		Value	No. of stores	Quantity		Value
		Cases	<u>2/</u> Av.			Cases	<u>2/</u> Av.	
<u>Chain</u>								
Demonstration	8	171	21	678	8	276	34	960
Nondemonstration	8	42	5	167	8	69	9	244
Other	3	8	3	31	3	27	9	96
<b>Total</b>	<b>19</b>	<b>221</b>	<b>11</b>	<b>876</b>	<b>19</b>	<b>372</b>	<b>20</b>	<b>1,300</b>
<u>Large independent</u>								
Demonstration	2	33	16	130	2	23	12	81
Nondemonstration	<u>3/1</u>	3	3	12	2	16	8	57
Other	<u>3/7</u>	23	3	90	<u>4/7</u>	21	3	75
<b>Total</b>	<b>10</b>	<b>59</b>	<b>5</b>	<b>232</b>	<b>11</b>	<b>60</b>	<b>5</b>	<b>213</b>
<u>Small independent</u>	75	75	1	317	131	75	<u>5/</u>	245
<b>Grand total</b>		<b>355</b>		<b>1,425</b>		<b>507</b>		<b>1,758</b>

1/ Four-week promotion period, August 16-September 11, 1954.

2/ Cases of 24 10-ounce cans.

3/ One store dropped brand A after demonstration period.

4/ Only 7 of the 9 stores carried this brand. Five stores carried both brands.

5/ Approximately 0.5 case per store in those stocking the product. A number of small stores did not carry frozen foods.

Table 5.--Stores in Erie, Pa. included in market test on  
canned frozen grapefruit sections, by type

Type of store	: Total in : : the city : :	: Used : : for : : demonstrations :	: "Check" : stores <u>1</u> / :
	<u>Number</u>	<u>Number</u>	<u>Number</u>
National chain -----	4	2	2
Regional chain -----	8	4	4
Local chain -----	4	2	2
Major independent -----	15	2	2
Total	31	10	10

1/ Comparable stores by which to compare the effectiveness of the demonstrations.

Table 6.--Percentage and average of frozen grapefruit sections sold, by type of store, Erie, Pa., August 16-October 30, 1954 1/

Type of store	Cases <u>2/</u>				Value in dollars	
	No. of stores	Total	Av.	Percent of total	Total	Av.
<u>Chain</u>						
Demonstration	8	586	73	46	2,153	269
Nondemonstration check	8	199	25	15	732	92
Other	3	51	17	4	184	61
<b>Total</b>	<b>19</b>	<b>836</b>	<b>44</b>	<b>65</b>	<b>3,070</b>	
<u>Large independent</u>						
Demonstration	2	73	36	6	273	136
Nondemonstration check	2	29	14	2	104	52
Other	9	78	9	6	291	32
<b>Total</b>	<b>13</b>	<b>180</b>	<b>14</b>	<b>14</b>	<b>668</b>	
<u>Small independent</u>	307	270	1	21	1,050	3
<b>Grand total</b>	<b>339</b>	<b>1,286</b>	<b>4</b>	<b>100</b>	<b>4,787</b>	<b>14</b>

1/ Eleven-week market test period.

2/ Cases of 24 10-ounce cans.

Table 7.--Effect of size of store on volume of sales of frozen grapefruit sections, Erie, Pa., August 16-October 30, 1954 1/

Weekly store sales (dollars)	Sales of frozen grapefruit sections					
	Demonstration stores			Nondemonstration stores		
	No. of	Cases <u>2/</u>		No. of	Cases <u>2/</u>	
	stores	Total	Av.	stores	Total	Av.
25,000 - 75,000	4	420	105	4	120	30
15,000 - 24,999	4	165	41	4	101	25
5,000 - 14,999	2	73	36	9	119	13
2,000 - 4,999	-	-	-	5	19	4
1,000 - 1,999	-	-	-	5	10	2
500 - 999	-	-	-	3	3	1
0 - 499	-	-	-	1	<u>3/</u>	<u>3/</u>

1/ Eleven-week market test period.

2/ Cases of 24 10-ounce cans.

3/ Less than 0.5 case.

Table 8.--Size of frozen food department and sales of frozen grapefruit sections during 4-week promotion period, Erie, Pa. 1/

(Nondemonstration stores only)

	Average sales per store by store sales class 2/												Total	
	\$2,000-\$4,999		\$5,000-\$14,999		\$15,000-\$24,999		\$25,000-\$75,000		Stores audited		Average sales			
Front footage of frozen food department	Stores audited	Sales	Stores audited	Sales	Stores audited	Sales	Stores audited	Sales	Stores audited	Sales	Stores audited	Sales	Stores audited	Sales
	Number	Cases	Number	Cases	Number	Cases	Number	Cases	Number	Cases	Number	Cases	Number	Cases
1 - 5	3	1	--	--	--	--	--	--	3	--	3	--	1	1
6 - 12	1	4/	5	5	--	--	--	--	6	--	6	--	4	4
13 - 24	4	2	4	12	3	15	1	10	12	10	12	10	9	9
25 - 49	--	--	--	--	1	18	2	19	3	19	3	19	19	19
50 - 100	--	--	--	--	--	--	1	17	1	17	1	17	17	17
Total	8	1	9	8	4	16	4	16	25	16	25	16	8	8

1/ Promotion period of August 16-September 11, 1954.

2/ Weekly store business volume.

3/ Cases of 24 10-ounce cans.

4/ Less than 1 case.

Table 9.--Number of rows of frozen grapefruit sections displayed and average quantity sold per store during 4-week promotion period Erie, Pa. 1/

(Nondemonstration stores only)

Number of rows displayed	Average quantity sold by store sales class					
	\$5,000-\$14,999		\$15,000-\$24,999		\$25,000-\$75,000	
	No. of stores	Sales	No. of stores	Sales	No. of stores	Sales
		<u>Cases</u> <u>2/</u>		<u>Cases</u> <u>2/</u>		<u>Cases</u> <u>2/</u>
1	4	4.15	1	7.84	--	--
2	5	11.12	1	8.00	2	13.52
3	--	--	1	16.54	1	16.60
4	--	--	1	18.26	1	21.48

1/ August 16-September 11, 1954.

2/ Cases of 24 10-ounce cans.

Table 10.--Sales of selected frozen fruits and juices in retail food stores, Erie, Pa., August 16-October 30, 1954 1/

Product	Case unit	Average price per can	Sales	
			Quantity	Dollars
<u>Frozen fruits:</u>			<u>Cases</u>	
Grapefruit sections	24 10-ounce cans	15.4	1,286	4,787
Peaches	Do.	16.2	160	635
Strawberries	Do.	26.9	1,531	10,158
Melon balls	Do.	20.6	93	474
Fruit cocktail	Do.	27.7	9	62
Pineapple chunks	Do.	20.7	65	275
<u>Frozen concentrated juices:</u>				
Orange	48 6-ounce cans	16.2	7,241	58,384
Grapefruit	Do.	9.9	405	2,018

1/ The 11-week market test period for frozen grapefruit sections.



Table 11.--Sales and average prices of commodities covered by store audits,  
August 16-October 30, 1954, in Erie, Pa.

Product	Case unit	Quantity	Value	Average price
		<u>Cases</u>	<u>Dollars</u>	<u>Cents</u>
Frozen fruits				
Grapefruit sections	24 10-ounce cans	1,286	4,787	15.5
Peaches	Do.	145	635	18.2
Strawberries	Do.	1,531	10,158	27.6
Melon balls	Do.	93	474	21.2
Pineapple chunks	Do.	50	275	22.9
Fruit cocktail	Do.	9	62	28.7
Frozen concentrated juices				
Orange	48 6-ounce cans	7,241	58,384	16.8
Grapefruit	Do.	405	2,018	10.4
		<u>Boxes</u>	<u>Dollars</u>	<u>Dollars per box</u>
Fresh fruit				
Oranges				
Florida	Boxes	542	4,782	8.82
California	Do.	3,165	36,674	11.59
Total	Do.	3,707	41,456	11.18
Grapefruit				
Florida (white)	Do.	809	5,252	6.49
Florida (pink)	Do.	300	2,498	8.33
California (white)	Do.	792	6,923	8.74
Unidentified	Do.	31	308	9.94
Total		1,932	14,981	7.75
Canned single-strength juices		<u>Cases</u>	<u>Dollars</u>	<u>Cents</u>
Grapefruit	24 No. 2 cans	1,986	5,175	10.8
Orange	Do.	2,763	9,863	14.9
Orange-grapefruit	Do.	1,090	3,436	13.1
Tomato	Do.	4,708	13,643	12.1
Canned fruits				
Grapefruit sections	24 No. 2 cans	1,124	5,832	21.6
Pears	Do.	1,475	10,781	30.4
Peaches	Do.	2,672	15,542	24.2
Apricots	Do.	707	4,681	27.6
Fruit cocktail	Do.	2,284	16,795	30.6
Citrus salad	Do.	174	1,350	32.3

Table 12.--Estimated average weekly sales rate for selected frozen fruits and juices without special prices or promotions, Erie, Pa., August 16-October 30, 1954

Product	Case unit	Retail price per can	Sales
<u>Frozen fruits:</u>			
Grapefruit sections	24 10-ounce cans	15.5	42
Peaches	Do.	17.9	9
Strawberries	Do.	28.8	113
Melon balls	Do.	20.8	7
Fruit cocktail	Do.	27.7	1
Pineapple chunks	Do.	20.5	5
<u>Frozen concentrated juices:</u>			
Grapefruit	48 6-ounce cans	12.5	20
Orange	Do.	18.3	580

Table 13.--Canned fruit and frozen grapefruit section sales by retail food stores, Erie, Pa. August 16-October 30, 1954 1/

Product	Case unit	Average price per can <u>2/</u>	Sales
			<u>Cases</u>
Frozen grapefruit sections	24 10-ounce cans <u>3/</u>	15.4	1,286
	24 No. 2 cans	29.2	715
<u>Canned fruits:</u>			
Grapefruit sections	Do.	20.4	1,124
Citrus salad	Do.	31.2	174
Pears	Do.	29.6	1,475
Peaches	Do.	22.9	2,672
Apricots	Do.	26.9	707
Fruit cocktail	Do.	29.7	2,234

1/ Eleven-week market test period.

2/ Price per equivalent No. 2 can.

3/ Price per 10-ounce can.

Table 14.--Sales of grapefruit and grapefruit products during 11-week market test, measured in dollars, Erie, Pa. 1/

Type of store	No. of stores	Grapefruit sections			Grapefruit juices			Fresh		Total	
		Frozen	Canned	In citrus salad	Frozen concentrated	Canned single-strength	Blended juice equivalent 2/	grapefruit	Dollars	Percent	
	Number	Dollars Pct.:	Dollars Pct.:	Dollars Pct.:	Dollars Pct.:	Dollars Pct.:	Dollars Pct.:	Dollars Pct.:	Dollars	Percent	
Chain											
Demonstration	8	2,153	2,422	231	979	1,538	494	3,327	11,145		
Nondemonstration	8	732	1,662	170	608	1,108	452	2,891	7,623		
Other	3	185	211	36	72	229	109	528	1,370		
Total 3/	19	3,070	4,296	437	1,659	2,875	1,055	6,746	20,138	100	
Major independent											
Demonstration	2	273	86	6	43	157	69	323	959		
Nondemonstration	2	104	52	8	17	119	37	432	769		
Other	9	291	184	39	59	344	107	1,330	2,354		
Total 3/	13	669	323	53	119	620	213	2,085	4,081	100	
Small independent	307	1,050	1,215	195	240	1,680	450	6,135	10,965	100	
Grand Total 3/	339	4,789	5,834	685	2,018	5,175	1,718	14,966	35,184	100	

1/ August 16 to October 30, 1954 was the 11-week test period.

2/ Grapefruit juice equivalent of orange-grapefruit blended single-strength juice.

3/ Totals may be slightly inexact as figures were rounded.

Table 15.--Fresh fruit equivalent of grapefruit and grapefruit products sales, 11-week market test, Erie, Pa. 1/

Type of store	Number of stores	Grapefruit sections				Grapefruit juice				Fresh		Total grapefruit	
		Frozen	Canned	Citrus salad equivalent	Frozen concentrated	Canned single-strength	Blended juice equivalent 2/	Fresh grapefruit	Boxes	Pct.	Boxes		Pct.
	Number	Boxes	Pct.	Boxes	Pct.	Boxes	Pct.	Boxes	Pct.	Boxes	Pct.	Boxes	Pct.
Chain													
Demonstration	8	228		362		26		476		523		442	
Nondemonstration check	8	78		251		20		299		382		375	
Other	3	20		27		3		21		62		68	
Total 3/	19	326	8	640	16	49	1	796	20	967	25	885	22
Major independent													
Demonstration	2	28		12		1		12		40		36	
Nondemonstration check	2	11		8		1		5		40		59	
Other	9	31		21		4		16		95		159	
Total 3/	13	70	11	41	6	6	1	33	5	175	27	254	40
Small independent	307	105	6	135	8	15	1	60	4	420	26	780	48
Grand total 3/	339	501	8	816	13	70	1	889	14	1,562	25	1,919	31

1/ August 16 to October 30, 1954.

2/ Grapefruit juice equivalent in orange-grapefruit blended single-strength juice.

3/ Totals may be slightly inexact as figures were rounded.

Table 16.--Dollar sales of oranges and orange products during 11-week market test, Erie, Pa. 1/

Type of store	Number of stores	Orange sections (in citrus salad)	Orange juice				Fresh oranges	Total	
			Frozen concentrated	Canned single-strength	Blended juice equivalent 2/				
	Number	Dollars	Pct.	Dollars	Pct.	Dollars	Pct.	Dollars	Percent
Chain									
Demonstration	8	231		22,186		2,732		7,759	33,402
Nondemonstration check	8	170		13,775		2,123		6,991	23,510
Other	3	26		4,807		413		2,189	7,545
Total 3/	19	427	1	40,768	63	5,268	8	16,939	64,457
Major independent									
Demonstration	2	7		1,766		247		1,324	3,413
Nondemonstration check	2	8		1,110		223		1,539	2,917
Other	9	39		2,485		550		3,175	6,356
Total 3/	13	54	47	5,361	42	1,020	8	6,038	12,686
Small independent									
Demonstration	307	195	1	12,255	35	3,675	10	18,480	35,055
Other	339	675	1	58,384	52	9,963	9	41,456	112,198
Grand total 3/									

1/ August 16 to October 30, 1954

2/ Grapefruit juice equivalent in orange-grapefruit blended single-strength juice.

3/ Totals may be slightly inexact as figures were rounded.

4/ Less than 0.5 percent.

Table 17.--Fresh fruit equivalent of oranges and orange products sales,  
11-week market test, Erie, Pa. 1/

Type of store	Number of stores	Orange sections (in citrus salad)		Orange juice			Fresh oranges		Total	
		Boxes	Pct.	Frozen concentrated	Canned single-strength	Blended juice equivalent <u>2/</u>	Boxes	Pct.	Boxes	Percent
Chain										
Demonstration	8	19		4,887	498	82	761		6,247	
Nondemonstration check	8	14		3,029	390	77	654		4,164	
Other	3	2		1,054	61	16	202		1,334	
Total <u>3/</u>	19	35	<u>4/</u>	8,970	76	175	1,617	14	11,715	100
Major independent										
Demonstration	2	1		353	44	11	110		518	
Nondemonstration check	2	1		241	41	6	147		436	
Other	9	3		494	97	17	274		885	
Total <u>3/</u>	13	5	<u>4/</u>	1,088	182	34	531	29	1,839	100
Small independent										
Demonstration	307	15	<u>1/</u>	2,175	585	60	1,560	36	4,395	100
Grand total <u>3/</u>	339	55	<u>4/</u>	12,233	68	269	3,707	21	17,980	100

1/ August 16 to October 30, 1954.

2/ Grapefruit juice equivalent of orange-grapefruit blended single-strength juice.

3/ Totals may be slightly inexact as figures were rounded.

4/ Less than 0.5 percent.

Household Survey Data

Table 18.--Relation between awareness of availability of frozen grapefruit sections and personal characteristics of homemakers

Personal characteristics	Aware	Unaware	Homemakers
	Percent	Percent	Number
Age <u>1/</u>			
30 years and under -----	59	41	141
31 to 40 years -----	66	34	237
41 years and older -----	65	35	368
Education <u>2/</u>			
None or grammar school -----	43	57	167
High school -----	69	31	466
College -----	80	20	111
Number in family			
1 or 2 -----	64	36	241
3 or 4 -----	63	37	331
5 or more -----	67	33	181
Income group <u>3/</u>			
Low - \$3,640 or less -----	54	46	224
Middle - \$3,641 - \$5,465 -----	69	31	216
High - \$5,466 or more -----	71	29	220

1/ Age was not ascertained for 7 homemakers.

2/ Education was not ascertained for 9 homemakers.

3/ Income was not ascertained for 93 homemakers.

Table 19.--Relation between purchase of frozen grapefruit sections in the last 2 months and personal characteristics of homemakers

Personal characteristics of homemakers	Replies to question: "Have you bought any frozen grapefruit sections in the last 2 months?"			
	Yes	No	Total	Homemakers
	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Number</u>
Age <sup>1/</sup>				
30 years and under -----	48	52	100	83
31 to 40 years -----	59	41	100	157
41 years and older -----	57	43	100	240
Education <sup>2/</sup>				
None or grammar school -----	46	54	100	72
High school -----	56	44	100	320
College -----	66	34	100	89
Income group <sup>3/</sup>				
Low - \$3,640 or less -----	52	48	100	122
Middle - \$3,641 - \$5,465 -----	55	45	100	150
High - \$5,466 or more -----	63	37	100	157

<sup>1/</sup> Age of 4 homemakers was not ascertained.

<sup>2/</sup> Education of 3 homemakers was not ascertained.

<sup>3/</sup> Income for 55 homemakers was not ascertained.



Table 20.--Satisfaction with the taste of frozen grapefruit sections

Replies	Disregarding brand used	According to brand used	
		Brand A	Brand B
	Percent	Percent	Percent
Satisfied -----	85	82	87
Dissatisfied -----	14	17	13
Not ascertained -----	1	1	--
Total -----	100	100	100
	<u>Number</u>	<u>Number</u> <sup>1/</sup>	<u>Number</u> <sup>1/</sup>
Homemakers -----	272	65	102

<sup>1/</sup> Brand could not be identified by 105 homemakers.

Table 21.--Replies to the questions, "What was it that you liked about the taste of the frozen grapefruit section?" "What was it that you disliked?"

Homemakers who used frozen grapefruit sections		
Replies	Brand A	Brand B
	Percent <sup>1/</sup>	Percent <sup>1/</sup>
<u>Attributes Liked:</u>		
Tastes like fresh; retains natural flavor -----	49	57
Not too sweet or sour, just sweet enough -----	20	19
Sweet, put up with sugar -----	14	19
Not bitter -----	9	5
Fresher than canned sections -	5	--
Good taste (unspecified)-----	3	7
Better than canned sections --	3	2
Crisp -----	2	1
Doesn't taste like can; not tiny-----	2	1
Not tart -----	2	--
Not acid -----	--	2
Better than fresh -----	--	2
Unsweetened -----	--	1
Tangy -----	--	1
Tart tasting -----	--	1
Not sour -----	--	1
Miscellaneous likes -----	--	2
<u>Attributes Disliked:</u>		
Too sweet -----	11	--
Artificial, not natural tasting, doesn't taste like fresh ---	3	4
Bitter -----	--	5
Not sweet enough -----	--	2
Didn't taste like good quality grapefruit -----	--	1
Sour -----	--	1
Flat -----	--	1
Miscellaneous dislikes -----	2	--
Not ascertained, don't know --	5	3
	<u>Number</u>	<u>Number</u>
Homemakers <sup>2/</sup> -----	65	102

<sup>1/</sup> Percentages add to more than 100 because some homemakers gave more than 1 reply.

<sup>2/</sup> Brand could not be identified by 105 homemakers.

Table 22.--Relation between attributes of frozen grapefruit sections liked and disliked, other than taste, and brand used

Attributes	Brand A	Brand B
	<u>Percent</u> <sup>1/</sup>	<u>Percent</u> <sup>1/</sup>
<u>Attributes Liked:</u>		
Texture		
Sections firm, whole, full -----	29	21
Not mushy -----	--	2
Tender -----	--	1
Convenience		
Easy to serve, handy, no cutting, quick to prepare, saves time -----	72	62
Convenient--general -----	11	18
Convenient to keep, store -----	3	7
No strings, no seeds, no white sections ----	3	3
No waste -----	2	3
Versatility of use -----	2	--
Packaging, canned -----	--	1
Fact of being frozen -----	--	1
Year around availability -----	--	1
Size of can		
Good size -----	--	1
Other		
Good price, economical -----	--	2
Looks good -----	2	--
Miscellaneous likes -----	--	2
<u>Attributes Disliked:</u>		
Texture		
Stringy -----	3	--
Soft -----	2	1
Not tender -----	2	1
Mushy -----	--	2
Sections fall apart -----	--	1
Convenience		
Waiting for it to thaw out -----	5	3
Still icy after defrosting -----	--	1
Size of can		
Don't like size; need it larger -----	2	1
Other		
Too expensive -----	3	4
Prefer fresh grapefruit -----	--	1
Miscellaneous dislikes -----	3	--
Don't know; not ascertained -----	3	1
	<u>Number</u>	<u>Number</u>
Homemakers <sup>2/</sup> -----	65	102

<sup>1/</sup> Percentages add to more than 100 because some homemakers mentioned more than 1 attribute.

<sup>2/</sup> Brand could not be identified by 105 homemakers.

Table 23.--Replies to the question: "What would you ordinarily have used instead of frozen grapefruit sections for the dishes you just mentioned?"

Item replaced by frozen grapefruit sections	Kinds of uses or dishes			
	Breakfast	Salad	Snack	Dessert
	Percent <sup>1/</sup>	Percent <sup>1/</sup>	Percent <sup>1/</sup>	Percent <sup>1/</sup>
<b>Juices:</b>				
Orange juice -----	64	--	--	--
Tomato juice -----	6	--	--	--
Grapefruit juice -----	5	--	--	--
Prune juice -----	3	--	--	--
Grape juice -----	3	--	--	--
V-8 juice -----	1	--	--	--
Pineapple juice -----	1	--	--	--
Juice, unspecified -----	20	--	7	--
<b>Fresh fruits:</b>				
Grapefruit -----	17	8	--	3
Oranges -----	9	8	12	--
Bananas -----	3	6	5	3
Peaches -----	1	8	7	8
Melons -----	1	3	--	--
Pears -----	<sup>2/</sup>	12	7	5
Pineapple -----	--	12	--	--
Apples -----	--	9	27	3
Tomato -----	--	5	--	--
Plums -----	--	--	--	3
Fruit, unspecified -----	15	44	29	61
<b>Other:</b>				
Stewed fruits -----	6	--	--	--
Canned grapefruit sections -----	3	14	2	--
Cereal, toast, etc. -----	2	--	2	--
Jello, pudding, ice cream -----	--	6	--	26
Pies, cakes, cookies -----	--	--	17	11
Cheese, crackers -----	--	--	7	--
Popcorn, potato chips, peanuts -----	--	--	5	--
Fruit cocktail -----	--	--	2	5
Fruit sauces -----	--	--	--	3
Dried fruits -----	--	--	--	3
Beverages (coffee, milk) -----	--	--	5	--
Other -----	<sup>2/</sup>	6	3	--
Don't know; not ascertained -----	2	6	17	5
	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>
Homemakers -----	233	66	41	38

<sup>1/</sup> Percentages add to more than 100 because some homemakers mentioned more than 1 item.

<sup>2/</sup> Less than one-half of 1 percent.

Table 24.--Use of competing citrus products by users and aware nonusers of frozen grapefruit sections

Competing citrus products	Users				Aware nonusers			
	Used	Did not use	Not ascertained	Total	Used	Did not use	Total	Home-makers
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Number
Frozen orange juice -----	80	19	1	100	69	31	100	212
Canned orange juice -----	21	78	1	100	36	64	100	212
Fresh oranges -----	63	36	1	100	67	33	100	212
Canned blend of orange and grapefruit juice -----	21	78	1	100	26	74	100	212
Frozen blend of orange and grapefruit juice -----	22	77	1	100	17	83	100	212
Canned grapefruit juice -----	31	69	1/	100	30	70	100	212
Canned grapefruit sections -----	53	47	1/	100	39	61	100	212
Fresh grapefruit -----	66	34	1/	100	67	33	100	212
Frozen grapefruit concentrate --	22	78	1/	100	12	88	100	212
Other citrus products -----	54	45	1	100	56	44	100	212

1/ Less than 1 percent.

Table 25.--Average servings per can of frozen grapefruit sections

Number of servings	Family size		
	One or two	Three or four	Five or more
	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
One -----	1	2	2
Two -----	45	16	16
Three -----	34	54	52
Four -----	17	22	21
Five or more -----	1	1	8
Don't know; not ascertained.	2	5	1
<b>Total -----</b>	<b>100</b>	<b>100</b>	<b>100</b>
	<u>Number</u>	<u>Number</u>	<u>Number</u>
Homemakers -----	85	124	63

Table 26.--Relation between family size and satisfaction as to adequacy of can size. Replies to the question: "Is this a good size for your family?"

Replies	Family size		
	One or two	Three or four	Five or more
	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Yes -----	88	64	32
No -----	12	35	68
Don't know; not ascertained -----	--	1	--
<b>Total -----</b>	<b>100</b>	<b>100</b>	<b>100</b>
	<u>Number</u>	<u>Number</u>	<u>Number</u>
Homemakers -----	85	124	63

Table 27.--Replies to the question: "How did you defrost your frozen grape-fruit sections?"

Replies	Brand A	Brand B
	<u>Percent</u>	<u>Percent</u>
Followed instructions on label -----	26	6
Did not follow instructions -----	74	93
Not ascertained -----	--	1
Total -----	100	100
	<u>Number</u>	<u>Number</u>
Homemakers $\frac{1}{}$ -----	65	102

$\frac{1}{}$  Brand was not identified by 105 homemakers.

Table 28.--Replies to the question: "Was the texture of your frozen grape-fruit sections satisfactory after defrosting?"

Replies	Brand A	Brand B
	<u>Percent</u>	<u>Percent</u>
Texture satisfactory -----	91	93
Texture not satisfactory -----	6	5
Not ascertained -----	3	2
Total -----	100	100
	<u>Number</u>	<u>Number</u>
Homemakers $\frac{1}{}$ -----	65	102

$\frac{1}{}$  Brand was not identified by 105 homemakers.









