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CONSUMER USES AND EVALUATION OF  
TEXAS FRESH EARLY ORANGES

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TEXAS AGRICULTURAL EXPERIMENT STATION-TEXAS A&M UNIVERSITY  
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# THE TEXAS AGRICULTURAL MARKET RESEARCH AND DEVELOPMENT CENTER

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The purpose of the Center is to be of service to agricultural producers, groups and organizations, as well as processing and marketing firms in the solution of present and emerging market problems. Emphasis is given to research and educational activities designed to improve and expand the markets for food and fiber products related to Texas agriculture.

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## HIGHLIGHTS

In the fall of 1972, in-store demonstrations for Texas fresh early oranges were conducted on November 9 to 11 in twenty retail stores in Oklahoma City and Tulsa. Professional interviewers were stationed near the produce departments on Thursday and Friday afternoons, November 9 and 10, 1972 to obtain the names and telephone numbers of Texas fresh early orange purchasers.

Approximately one week later, telephone interviews with 417 purchasers of Texas fresh early oranges were conducted by trained interviewers to determine usage patterns and opinions.

Following are the highlights of the findings:

1. Only 7.5 percent of households use freshly squeezed orange juice. Another 7.5 percent use single strength, 9 percent use chilled orange juice and 73 percent use FCOJ<sup>1/</sup>.
2. About 90 percent of households use the Texas fresh early orange for eating out of hand.
3. Small households with older members use orange juice more frequently than younger or larger households.
4. Most households purchase bulk oranges and many purchase in bags.
5. The 5 pound bag has overwhelming preference for size.
6. One household out of five expressed dissatisfaction with the quality of Texas fresh early oranges because of tough membrane, too many seeds, bad flavor and dryness.
7. Most households typically purchase Florida or California fresh oranges while one-third are not aware of product identity with respect in production area.
8. Household consumption rate for a 5 pound bag of Texas fresh early oranges has considerable variation with 42 percent of households consuming all oranges one week after purchase and 10 percent consuming only one pound.

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<sup>1/</sup> Frozen concentrate orange juice

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## FOREWORD

This is an industry report written in non-technical terms in respect to consumer uses and evaluation of Texas fresh oranges. This report is addressed to growers, handlers, and managers of the many Texas citrus marketing firms.

This research was conducted in Oklahoma City and Tulsa, Oklahoma during the fall of 1972 in conjunction with a Market Research project relative to the effectiveness of in-store demonstrations for Texas early oranges.

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## CONSUMER USES AND EVALUATION OF TEXAS FRESH EARLY ORANGES

Chan Connolly, Robert Degner and John Nichols<sup>1/</sup>

### SUMMARY AND CONCLUSIONS

#### Summary:

A survey of 417 purchasers of Texas fresh early oranges was conducted by telephone in Oklahoma City and Tulsa, Oklahoma. This was conducted in conjunction with a study of the effectiveness of in-store demonstrations in promoting Texas early oranges at the retail level in November of 1972.

Two-thirds of the households in Oklahoma City and Tulsa, Oklahoma purchasing Texas fresh early oranges during the week of in-store demonstrations of November 6, 1972 refrigerated the oranges.

Nine percent of the households reported having some spoilage of Texas fresh early oranges prior to consumption.

Considerable variation exists in household consumption rates of Texas fresh early oranges. Less than one-half of the households consumed all of the 5 pound bag of oranges within one week after purchase while a few households consumed only one pound.

Households purchasing Texas fresh early oranges generally consume the oranges by eating out of hand. A few households juiced the oranges and an occasional household utilized the oranges in fruit salads.

Small household size at the greater age level utilized the most Texas fresh early oranges for juice.

The larger households at the lower age level utilized the most Texas fresh early oranges for eating out of hand.

Some households were dissatisfied with Texas fresh early oranges; however, most households reported no dissatisfaction. The primary reasons for dissatisfaction are tough membrane, too many seeds, bad flavor and dryness.

Most households purchase oranges prior to Thanksgiving.

More than half of the households purchasing Texas fresh early oranges during the in-store demonstration week of November 6, 1972 typically purchase Florida or California oranges. One-third

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of the households did not know what kind of oranges they normally purchased because of the lack of product identity.

More than half of the households purchasing Texas fresh early oranges during the in-store demonstration week, had purchased Texas oranges before while many had not.

Most households normally purchase fresh oranges in the bulk while many households purchase oranges in bags.

Most of the large size households typically consume a 5 pound bag of oranges within one week after purchase while most small households consume a 5 pound bag in two weeks.

Households have an overwhelming preference for a 5 pound bag size for oranges.

Most households use orange juice at least once per month and the FCOJ form of orange juice is used by most households. A few households use chilled juice, freshly squeezed and single strength orange juice with an occasional household using a substitute juice product.

Household heads under 35 years of age use mostly FCOJ with less than 1 percent using freshly squeezed; whereas 16 percent of households 55 years of age and over use freshly squeezed.

Middle size households use the most FCOJ and small size households use more freshly squeezed and chilled orange juice. Substitute orange juice has the greatest consumption rate among large size households.

High income households tend to use more FCOJ and low income households tend to use freshly squeezed and single strength orange juice.

### Conclusions:

The Texas citrus industry historically has considered the Texas fresh early orange primarily as a fresh juice orange. It is apparent from this research that only a few households purchasing Texas fresh early oranges are using the oranges for juicing. Most households consume Texas fresh early oranges out of hand. As the Texas fresh early orange is not as suitable for eating out of hand as compared to California-Arizona oranges, it becomes apparent that some households will be dissatisfied with Texas fresh early oranges.

Households using the Texas fresh early oranges the most for juicing are small in size with the household head being 55 years of age or over.

During the week of November 6, 1972 in-store demonstrations in Oklahoma City and Tulsa persuaded many new households to purchase Texas fresh early oranges. As the sales response for Texas fresh early oranges decayed to the pre-in-store demonstration level after one week following the in-store demonstrations, it is evident from this buying behavior that the new households purchasing Texas fresh early oranges for the first time did not make repeat purchases.

The target market segment for the promotion of Texas fresh early oranges for home juicing is extremely limited. Small household size with age levels approaching or exceeding the retirement age use the most fresh oranges for home juicing; however, these households will be making market exit at a relatively rapid rate in the future. The younger and larger households use mostly FCOJ because of convenience, economy, year-round product availability, and product consistency.

It is recognized that the Texas fresh early orange is not as suitable as the California-Arizona orange for eating out of hand; however, the Texas fresh early orange is very similar to the Florida early orange. The markets in which Texas has a transportation cost advantage over Florida offers a major opportunity for market expansion.

Since most households consume FCOJ, the Texas citrus industry has an opportunity of utilizing more Texas early oranges for processing to satisfy this market segment. It is recognized that the current FOB market structure for Texas citrus raw stock used for processing results in a discounted price to the grower as compared to raw stock utilized for fresh. The discounted price for Texas citrus processing raw stock is associated with one dominant firm acting as price leader. A competitive Texas FOB market structure for processing raw stock will generate about the same economic returns per ton to grove owners as for citrus raw stock utilized for fresh.

## INTRODUCTION

### Situation:

The Texas citrus industry consists of more than 82,300 acres, one-third of which consists of early and mid-season oranges.

In terms of U. S. market share, Texas produced more than 4 percent of the U. S. total supply of early and mid-season oranges during the 1972-73 season. (4) Florida, California and Arizona U. S. market shares were 81, 14 and 1 percent respectively.

During the 1972-73 marketing season, Texas' total supply of early and mid-season oranges was 225,000 tons of which 31 percent (69,750 tons) was marketed in the fresh form. Florida's total supply was 4,050,000 tons of which 8 percent (324,000 tons) was marketed in the fresh form. Texas' and Florida's fresh early oranges typically are marketed during the same time period and compete in retail food markets. Texas fresh early and mid-season supply represents 18 percent of the combined Texas and Florida fresh early and mid-season orange supply.

Texas' marketing season for the fresh early and mid-season oranges normally starts September 25 and extends through January. During this period a relatively small supply of California and Arizona's Valencia oranges are marketed in competition with Texas and Florida's fresh early and mid-season oranges. California's navel oranges typically enter the market about November 5 and continue through June 20. In addition, a supply of fresh early and mid-season oranges is imported from Mexico which also competes with Texas early and mid-season oranges in the fresh markets. During the marketing season for Texas fresh early and mid-season oranges, considerable competition exists from other orange supply areas.

### Problem:

Under Federal Marketing Order No. 906, the Texas Valley Citrus Committee (TVCC) is authorized to collect 4½ cents per 7/10 bushel carton of Texas fresh early oranges shipped by handlers qualifying under the Order. Approximately 4 cents of the assessment is allocated to advertising, promotion and merchandising. During the 1972-73 season, assessments from Texas fresh early oranges totaled \$157,815, of which about \$140,000 was allocated to advertising, promotion, and merchandising.

Each season the Texas citrus industry is faced with decision making in respect to the most efficient allocation of resources for expanding demand for Texas fresh early oranges. This study is designed to gain knowledge on uses and evaluations by household heads with respect to Texas fresh early oranges. Findings from this research may be used by the Texas citrus industry decision makers to more accurately define their targets in future demand expanding activities.

Objective:

The objective of this investigation is as follows:

Determine consumer uses and evaluations regarding Texas fresh early oranges.

RESEARCH PROCEDURE

In the fall of 1972, Texas Agricultural Market Research and Development Center was requested by TVCC to measure the cost-benefit of in-store demonstrations with respect to Texas fresh early oranges. This research was conducted in forty retail food stores situated in Oklahoma City and Tulsa, Oklahoma from October 16 through December 9, 1972. Professional interviewers were stationed near the produce departments in the 20 demonstration stores on Thursday and Friday afternoons, November 9 and 10, 1972, to obtain the names and telephone numbers of Texas fresh early orange purchasers.

All Texas fresh early oranges in this test were prepacked in 5 pound consumer bags at the wholesale level by the retail food firm. The name and home address of the food firm was printed on each 5 pound bag. No identification existed as to the identity of oranges with respect to production area. Some price cards in the retail food store did have "Texas Oranges" or "Texas new crop juice oranges" 5 pounds for 69 cents situated on the display.

Approximately one week later telephone interviews with 417 purchasers of Texas fresh early oranges were conducted by trained interviewers to determine their usage patterns and opinions with respect to Texas fresh early oranges. A copy of the questionnaire is found in Appendix I.

Sample: A total of 201 questionnaires were completed for Oklahoma City and 216 for Tulsa, Oklahoma making a total of 417 for both test cities. The question relating to the form of orange juice used most often and the second form used most often by households had completed answers on 375 and 326 questionnaires respectively.

This difference is due primarily to about 10 percent of the households not using orange juice in any form. Information on household income level was completed on 360 questionnaires. All other questions were completed on more than 400 of the questionnaires.

Chi-square non-parametric tests were utilized in the analysis of the data to evaluate the differences in the distribution of responses by markets and demographic characteristics.

## TERMINOLOGY

Texas early and mid-season orange: A Texas early and mid-season orange is not a homogeneous product with respect to variety. The Texas early and mid-season orange classification typically includes the following seven (7) varieties, five (5) of which are seedless.<sup>1/</sup>

1. Marrs	Seedless
2. Hamlin	Seedless
3. Pineapple	Seeds
4. Joppa	Seedless
5. Jappa	Seedless
6. Navel	Seedless
7. Parson Brown	Seeds

Texas fresh early and mid-season orange: Texas fresh early and mid-season oranges represent the portion of the total supply consumed in the fresh form.

Texas early orange: Texas early orange and Texas early and mid-season oranges are synonymous terms.

### Quantity dimensions:

Occasional	- 1 to 5%
Few	- 5 to 10%
Some	- 10 to 25%
Many	- 25 to 45%
Most or Mostly	- 55 to 90%
Generally	- More than 90%

FCOJ: Frozen concentrated orange juice.

Level of Significance: A statistical term used by scientists to measure the probability of a well-founded conjecture (hypothesis) of being false. For example, at the 5 percent level of significance, the well-founded conjecture has a 95 percent probability of being true and a 5 percent probability of being false.

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<sup>1/</sup> A seedless orange is defined by horticulturists as having less than 8-10 seeds per orange on the average.

## ANALYSES AND DISCUSSION

Analyses: Analyses of data by questions are as follows:

QUESTION NO. 1. *Did you refrigerate the Texas fresh early oranges you recently purchased?*

All 417 questionnaires had completed answers as follows:

*Do you refrigerate your oranges?*

62%	Yes
38%	No

There was no difference between the sample of Oklahoma City households and the Tulsa households with respect to the percentage of Texas fresh early oranges refrigerated in the households after purchase at the 5 percent level of significance. Households that refrigerated Texas fresh early oranges had significantly less spoilage at the 5 percent level.

QUESTION NO. 2. *Have you had any spoilage of your recent purchase of Texas fresh early bagged oranges?*

A total of 417 households answered this question. As no statistical difference exists between the two household samples for the test cities at the 5 percent level, data from both cities were aggregated for the analysis that follows:

*Have you had any spoilage?*

No	90%
Yes	9%
Don't know	1%

As about two-thirds of the households kept Texas fresh early oranges under refrigeration, the few households experiencing spoilage were associated with households not refrigerating Texas fresh early oranges.

QUESTION NO. 3. *How much of the 5 lb. bag of Texas fresh early oranges have you used?*

This question was asked about one week after the household purchased a 5 lb. bag of Texas fresh early oranges at the local food store. The purpose of this question was to gain knowledge with respect to the household consumption rate after the purchase.



*Pounds Consumed Approximately One Week After Purchase*

<i>Pounds Consumed</i>	<i>Percent of Households</i>
1	10
2	21
3	7
4	20
5	42

Considerable variation exists in the rate of household consumption. The complete 5 pound bag was consumed one week after purchase by 42 percent of households while 10 percent had consumed only one pound one week after purchase.

QUESTION NO. 4 and 5. *How did you use or how do you expect to use your Texas fresh early oranges recently purchased?*

Statistical constraints precluded the analysis of data by dividing households into a dichotomy according to those that had used Texas fresh early oranges against those that had not. Consequently, data collected from questions 4 and 5 were combined.

A total of 415 have completed answers for both test cities with no difference existing between cities at the 5 percent level of significance. The purpose of this question is to gain knowledge on household utilization of Texas fresh early oranges.

The utilization of Texas fresh early oranges is examined by household size and by age of household head. With no statistical difference existing between the two samples of households for the test cities at the 5 percent level of significance, all data are aggregated for these analyses. Utilization of Texas fresh early oranges in relation to household size is as follows:

*Usage of Texas Fresh Early Oranges by Household Size, Both Cities*

<i>Way Used</i>	<i>---Household Size, Persons---</i>			<i>All Households</i>
	<i>1 - 2</i>	<i>3 - 5</i>	<i>6 +</i>	
	<i>---Percent of Households---</i>			
<i>Out of Hand</i>	82.3	92.5	95.5	89.6
<i>Juice</i>	14.6	5.4	2.2	8.0
<i>Salads</i>	3.1	2.1	2.3	2.4
<i>Totals</i>	100.0	100.0	100.0	100.0

As the Texas fresh early orange has been historically considered a juice orange by the Texas citrus industry, the utilization of 90 percent by eating out of hand and only 8 percent for juicing is most revealing. Texas fresh early oranges may be eaten out of hand but are best adapted for juicing. This provides a partial explanation for the rapid decay sales response for Texas fresh early oranges after the first week following the in-store demonstration week in Oklahoma City and Tulsa during the week of November 6, 1972. (1)

The analysis with respect to utilization of Texas fresh early oranges in relation to age of household head is as follows:

*Usage of Texas Fresh Early Oranges by Age Groups, Both Cities*

Way Used	Age Groups <sup>1/</sup> -----Years-----			All Respondents
	Under 35	35-54	55 +	
	- - -Percent of Respondents- - -			
Out of Hand	94.8	90.4	81.5	89.6
Juice	4.3	6.7	15.2	8.0
Salads	0.9	2.9	3.3	2.4
Totals	100.0	100.0	100.0	100.0

<sup>1/</sup> Age groups reflect the age of the head of household

The above analyses clearly reveal that the utilization of Texas fresh early oranges is associated with age of household head. Households in the higher age classification utilize less oranges out of hand and consume more in fresh juice and salads.

QUESTION NO. 6. *Were you satisfied with the quality of Texas fresh early oranges?*

This question was framed to gain knowledge with respect to household evaluations of Texas fresh early orange quality. Precise differences exist among the two test cities regarding the dissatisfied product characteristics associated with Texas fresh early oranges. The magnitude of satisfied and dissatisfied households for both cities are as follows:

*Are you satisfied with the quality of Texas fresh early oranges?*

Yes	80%
No	20%

A further analysis was made in respect to the households that were not satisfied with Texas fresh early oranges. The major product characteristics associated with dissatisfaction for both cities are as follows:

*Characteristics Associated with Dissatisfied Households*

	<u>Oklahoma City</u>	<u>Tulsa</u>
	- - - - -Percent- - - -	
Tough Membrane, Etc.	16.0	11.0
Bad flavor	4.5	6.3
Too many seeds	19.4	5.3
Dry	7.0	3.4
Not too sweet	6.0	1.0
Other	47.1	73.0

A larger percentage of Oklahoma City households (27 percent) were dissatisfied with Texas fresh early oranges than Tulsa households (13 percent) and for different reasons. The fact that the Texas fresh early orange is not a homogeneous product; consisting primarily of seven varieties, two of which are not seedless, provides some insight to the possible differences that exist among the two test cities regarding product characteristics associated with dissatisfaction. For example, 19.4 percent of the sample of households in Oklahoma City expressed dissatisfaction with too many seeds. It is surmised that this dissatisfaction is related to more Pineapple and Parson Brown varieties being shipped into the Oklahoma City market compared to Tulsa. Also a larger percentage of the Oklahoma City households (16 percent) stated that tough membrane was an objectionable attribute of Texas fresh early oranges compared to Tulsa households (11 percent).

QUESTION NO. 7. *Do you usually purchase oranges prior to Thanksgiving?*

All 417 questionnaires had answers to this question. As the demand for Texas fresh early oranges historically has expanded prior to the Thanksgiving and Christmas holiday seasons, this question was designed to gain knowledge on the magnitude of households purchasing oranges prior to Thanksgiving. There is no difference between Oklahoma City and Tulsa households in this buying behavior at the 5 percent level of significance. The percentage of households that typically purchase oranges prior to Thanksgiving is as follows:

*Percentage of Households Purchasing Oranges Prior to Thanksgiving*

Usually purchase before Thanksgiving	82%
Usually do not purchase before Thanksgiving	18%

Most households usually purchase oranges before Thanksgiving.

QUESTION NO. 8. *What kind of oranges do you usually buy?*

All 417 questionnaires had answers to this question which was designed to gain knowledge with respect to the kind of oranges, in reference to origin, that the sample of households normally purchase. No statistical difference exists between the test cities in this behavior pattern at the 5 percent level of significance. The kind of oranges usually purchased by the households are as follows:

*Kinds of Oranges Usually Purchased*

<u>Origin</u>	<u>Households</u>
Florida or California	56%
Do not know	34%
Texas	10%

Over one-half of the households in the sample typically purchased Florida or California oranges and one-third were not aware of the origin. The balance of the households representing 10 percent, usually purchased Texas oranges.

The one-third of households not aware of the origin of oranges is associated with the lack of product identification at the retail food level. Individual Texas and Mexican oranges have only "color added" on the surface. The only Texas oranges identified in the market place are packed in 5, 8 and 18 pound bags and the 20 pound carton at the FOB level. During the 1972-73 season, 54 percent of all Texas fresh oranges were marketed in these packages; consequently, 46 percent had no product identification. (2) Texas oranges prepacked at the wholesale or retail level have no product identification in respect to origin of product.

The FOB handler's identity on the 1/2 standard carton is lost when oranges are placed on bulk display at the retail level by the produce store manager. After placing the oranges on display, the 1/2 standard carton is discarded; consequently, the ultimate purchaser has no knowledge in respect to origin of production.

In regard to the second part of question 8 relative to the percentage of households buying Texas oranges before the in-store demonstrations, all 417 households in the sample answered this question. There was no statistical difference between the sample households from each test city regarding the response to this question at the 5 percent level of significance. Households that had and had not purchased Texas oranges prior to the in-store demonstrations are as follow:

*Households That Had and Had Not Purchased Texas Oranges Prior to In-Store Demonstrations*

<i>Had purchased Texas oranges before the in-store demonstrations</i>	<i>60%</i>
<i>Had not purchased Texas oranges before the in-store demonstrations</i>	<i>40%</i>

Of all households purchasing Texas oranges during the in-store demonstrations, 40 percent had not purchased Texas oranges before. In-store demonstrations were responsible for inducing new households to purchase Texas fresh early oranges, however, no measurable carry-over of this sales response existed after one week following the in-store demonstration week. (1 )

QUESTION NO. 9. *How do you usually buy oranges:*

All 417 households in the sample answered this question which was designed to determine how consumers purchased fresh oranges with respect to packaging. No significant difference exists between test cities at the 0.5 percent level. Results of this analysis follow:

*How Do You Usually Buy Oranges?*

Bulk	59%
Bags	39%
Packaged	2%

Most households purchase oranges in the bulk while many households purchase oranges in bags. An occasional household purchased oranges in an over-wrapped tray.

QUESTION NO. 10. *How long does a 5 pound bag of oranges usually last your household?*

As all Texas fresh early oranges sold in the test stores were in 5 pound poly bags, this question was framed in terms of bagged oranges. The purpose of the question is to gain knowledge of the length of time required by households to consumer 5 pounds of oranges. Household size is measured by number of persons in the household. Results of analysis follow:

*Number of Days Required to Consume Five Pound Bag of Oranges  
Households of Various Sizes*

Days	-----Household size, persons-----		
	1 - 2	3 - 5	6 or more
-----Percent-----			
0 - 7	42.1	44.3	74.5
8 - 14	44.3	39.0	25.6
15 +	<u>13.7</u>	<u>16.4</u>	<u>0.0</u>
Totals <sup>1/</sup>	100.1	99.7	100.1

<sup>1/</sup> Totals do not add to 100 percent due to rounding

Most of the households with 6 or more persons consume 5 pounds of oranges within one week after purchase and all oranges were consumed within two weeks after purchase. It is apparent that large size households consume oranges at a greater rate than smaller households.

Households with 3 to 5 persons and with 1 to 2 persons have similar consumption rates with many households consuming about 40 percent of the 5 pound bag during each of the first two weeks after purchase. The balance of the 5 pound bag purchase was consumed 15 or more days after purchase.

QUESTION NO. 11. *What size bag would serve the needs of your household best?*

This question was presented to household heads to ascertain preferences in respect to bag size for pre-packed oranges. The answers are classified by five different bag sizes ranging from 2 to 20 pounds. The 5 pound bag size is the overwhelming household preferred bag size as depicted in Figure 1.

This information is most pertinent for the TVCC when developing container regulations prior to each marketing season.

QUESTION NO. 12. *Who in your household uses oranges most frequently?*

This question was designed to determine if a difference exists in household consumption of Texas fresh early oranges with respect to adults and children.

Answers to this question were complete in all of the 417 questionnaires. No difference exists between the sample of households in each test city at the 5 percent level of significance; consequently, all data are aggregated as follows:

*Who Uses Oranges Most Frequently?*

<i>Adults</i>	<i>54%</i>
<i>Children</i>	<i>46%</i>

Very little difference exists in the frequency of orange consumption in households for adults relative to children.

QUESTION NO. 13 (first part). *Do you use orange juice at least once a month?*

This is a question designed to lead into the next question pertaining to the form of orange juice used most often.

All 417 questionnaires had answers for this question. No difference exists between the household respondents for each of the two test cities at the 5 percent level of significance. The percent of households using orange juice at least once a month is as follows:

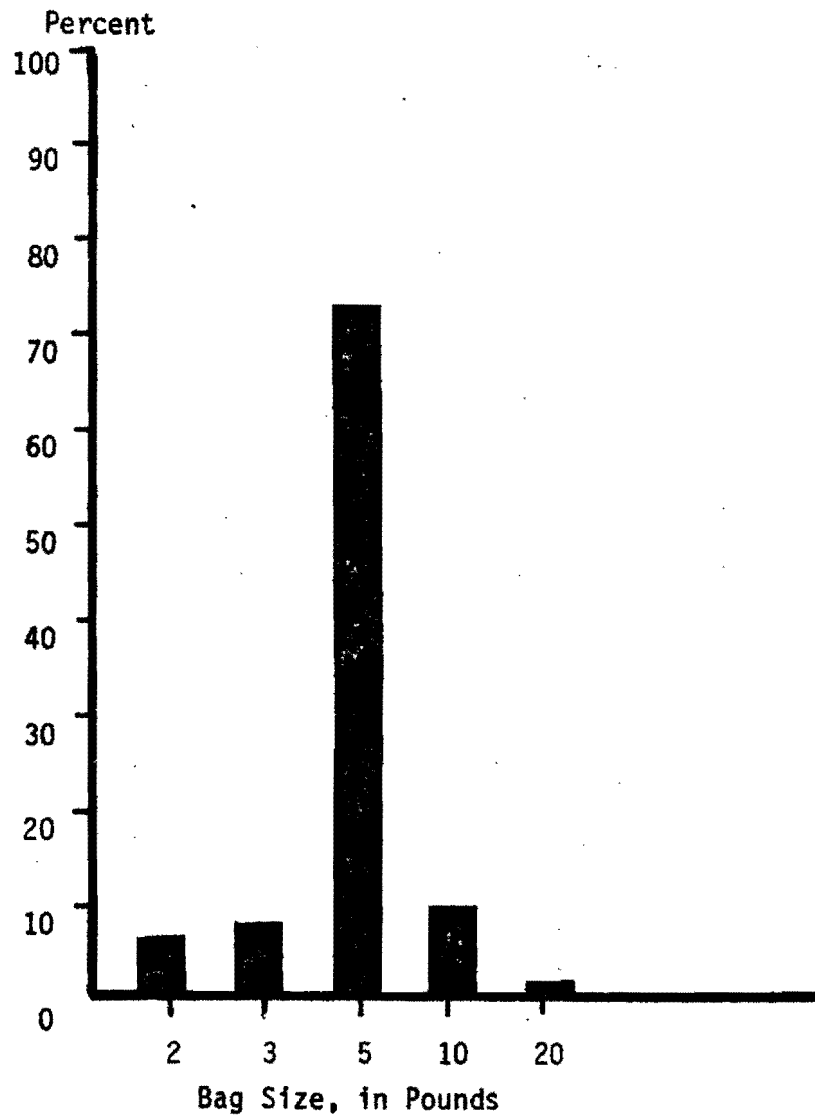


Figure 1. Percent of Respondents Preferring Various Bag Sizes For Fresh Oranges in Oklahoma City and Tulsa, Oklahoma November, 1972

Source: Computed from Interview Questionnaires

*Do You Use Orange Juice At Least Once Per Month?*

<i>Yes</i>	<i>90%</i>
<i>No</i>	<i>10%</i>

Orange juice is utilized in the general household food menu. An occasional household rarely uses orange juice which is consistent with previous research findings. ( 3 )

QUESTION NO. 13 (second part). *If yes, what form of orange juice do you use most often? Second most often?*

As the Texas fresh early orange is typically identified by the Texas citrus industry as a juice orange, this question was designed to measure the percentage of households that most often use freshly squeezed orange juice in addition to the other forms of orange juice. .

A total of 375 households responded to this question. This represents a good response as 10 percent of the households in the aggregate sample did not use any form of orange juice. As the form of orange juice used by households is not the same for each of the two cities, a subsequent analysis was made to identify the factors associated with this difference. Form of orange juice used by all households in sample is as follows:

*What form of orange juice do you use?*

<i>FCOJ</i>	<i>73.0%</i>
<i>Chilled</i>	<i>9.0%</i>
<i>Freshly squeezed</i>	<i>7.5%</i>
<i>Single strength</i>	<i>7.5%</i>
<i>Other</i>	<i>3.0%</i>

Most households use FCOJ. This form of orange juice is not only economical but also convenient for the housewife; consequently, is widely accepted. Chilled orange juice ranked second with freshly squeezed and single strength tied for third place. A few households use chilled orange juice and an occasional household used either freshly squeezed or single strength. The other form of orange juice generally represents the substitutes.

Results from this question reveal that only an occasional household uses freshly squeezed orange juice most often as the major form of orange juice.

Demographic Relationships: Demographic data on household size, age of household head, and household income level were collected to determine differences in household fresh orange utilization. These differences are as follows:



### Size of Household

*Middle size (3-5) households use mostly FCOJ*  
*Small size (1-2) households use more fresh and chilled orange juice*  
*Large size (6 and over) households use other forms*

The small size households use more fresh and chilled orange juice while the middle size households use mostly FCOJ. The larger size households use other forms such as the substitute powder due to economy.

### Age

*Under 35 years of age - 80% use FCOJ*  
*Less than 1% under 35 use freshly squeezed*  
*About 7.5% of 35-40 age use freshly squeezed*  
*About 16% of over 55 age use freshly squeezed*

The households within the older age group use more freshly squeezed orange juice as compared to the households within the younger age group that use mostly FCOJ. The small size households often consist of retired members which accounts for the small household size using more freshly squeezed orange juice. It is surmised that the convenience of FCOJ is a major consideration to the younger age group of households with children and employed housewives. The uniformity of product taste and the availability over a 12 month period are other important considerations.

### Income

*High income - tend to use more FCOJ*  
*Low income - tend to use freshly squeezed (associated with age)*  
*Low income - tend to use more single strength*

Households with high income levels tend to use more FCOJ while low income households tend to use more freshly squeezed and more single strength.

It is apparent that small size households in the high age and lower income levels are associated with retired members of households. These households consume the most freshly squeezed orange juice. A promotional program designed by the Texas citrus industry to expand demand for Texas fresh juice oranges need focus on this age group for more efficient allocation of resources.

## APPENDIX

Household Number \_\_\_\_\_  
Date and Time \_\_\_\_\_  
of Interview \_\_\_\_\_

Texas Agricultural Market  
Research and Development  
Center 19

Interviewee \_\_\_\_\_

Interviewer \_\_\_\_\_

Hello, Mrs. \_\_\_\_\_. This is \_\_\_\_\_ calling for the Market Research Center at Texas A&M University. May I ask you a few questions about the bagged Texas oranges that you bought recently at your local supermarket? This is a confidential interview and the information will be used only to improve the way Texas oranges are marketed.

1. Have you or have you not kept them in the refrigerator? A. Yes B. No
2. Have you or have you not had any spoilage of the Texas bagged oranges? A. Yes B. No C. Don't know
3. How much, if any, of the 5 lb. bag of Texas oranges have you used? lbs. \_\_\_\_\_ IF NONE GO TO QUESTION 4; OTHERWISE SKIP TO QUESTION 5.
4. (FOR RESPONDENTS WHO HAVE NOT USED TEXAS BAGGED ORANGES.) How do you expect to use them? (What percent of the oranges will be used for each use?) (ANSWER, THEN SKIP TO QUESTION 7)
5. (FOR RESPONDENTS WHO HAVE USED TEXAS BAGGED ORANGES) How did you use them? (What percent of the oranges were used for the various uses?)  
A. Out of hand \_\_\_\_\_% B. Juice \_\_\_\_\_% C. Salad \_\_\_\_\_% D. Other \_\_\_\_\_%
6. Were you or were you not satisfied with the quality of the Texas bagged oranges? A. Yes B. No.  
If yes, what did you like about them? \_\_\_\_\_  
If no, what didn't you like about them? \_\_\_\_\_
7. Do you or do you not usually purchase oranges before Thanksgiving? A. Yes B. No
8. What kind of oranges do you usually buy? A. Florida or California B. Texas C. Don't know  
(If answer is A or C) As far as you know, have you ever bought Texas oranges before? A. Yes B. No
9. How do you usually buy oranges? A. Bulk or loose B. Bagged C. Packaged
10. How long does a 5 lb. bag of oranges usually last your household? (days) \_\_\_\_\_ Don't know
11. What size bag would serve the needs of your household best? \_\_\_\_\_ lb.
12. Who in your household uses oranges most frequently? A. Adults B. Children
13. Do you or do you not use orange juice at least once a month? A. Yes B. No.  
If yes, what form of orange juice do you use most often? Second most often?  
A. \_\_\_\_\_ Frozen concentrate C. Single strength (canned) E. \_\_\_\_\_ Other  
B. \_\_\_\_\_ Freshly squeezed D. Chilled (bottled) (Specify) \_\_\_\_\_

#### Consumer Survey - Demographic Information

1. How many persons are in your household \_\_\_\_\_
2. In which of the following age groups does the head of the household belong?  
A. Under 25 years B. 25-34 C. 35-44 D. 45-54 E. 55-64 F. Over 65
3. What is the approximate total annual household income? Is it  
A. Over 25,000 C. Over 15,000 E. Over 7,500 G. Less than 5,000  
B. Over 20,000 D. Over 10,000 F. Over 5,000

## BIBLIOGRAPHY

1. Connolly, Chan, et. al., Costs and Benefits of In-Store Demonstrations For Texas Early Oranges, Texas Agricultural Market REsearch and Development Center, Texas Agricultural Experiment Station, College Station, Texas. Industry Report, April 1973.
2. Connolly, Chan, et. al., Texas Fresh Citrus Shipments By Containers, 1972-73, Texas Agricultural Market Research and Development Center, Texas Agricultural Experiment Station, Weslaco, Texas. Research Report MRC 73-4.
3. Nichols, John P. et. al., A Consumer Test of Citrus Drinks Made From Comminuted Whole Citrus Fruit, Texas Agricultural Market Research and Development Center, Texas Agricultural Experiment Station at College Station and Weslaco in cooperation with U. S. Department of Agriculture, ARS, Food Crops Utilization Research Laboratory, Weslaco, Texas. MRC 72-4 May 1972.
4. Texas Department of Agriculture and U. S. Department of Agriculture, Texas Citrus, Crop and Livestock Reporting Service, SRS, P. O. Box 70, Austin, Texas 78767. February 1, 1974.