

THE SOFT-SERVE DAIRY PRODUCTS INDUSTRY IN OKLAHOMA:  
SALES, COSTS, AND MARKETING PRACTICES

By

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## CHAPTER I

### INTRODUCTION

Present-day frozen desserts evolved over a period of almost five centuries. It is said to have had its beginning in the practice of icing beverages with snow from snow-capped mountains. With the discovery by the Italians that saltpeter makes a freezing mixture with ice, it became possible not only to chill but actually to freeze beverages, resulting in products not unlike our ices. Recipes for making water ices and milk ices may have been brought to Europe by Marco Polo after his fifteenth century visit to Japan. Water ices were definitely known in the 1500's. Eventually milk and cream were introduced into these mixtures, resulting in products resembling present-day sherbets. As cream was introduced more and more into these mixtures, a product resembling ice cream as we know it today evolved. Such a product was known in Paris in 1774.

Ice cream was first sold in this country in 1786, but it was not until 1851 that it was manufactured on anything resembling a wholesale scale. At that time Mr. Jacob Fussell, a Baltimore milk dealer, decided to manufacture ice cream in order to utilize his surplus cream. The business was so successful that he devoted his entire plant to the manufacture of ice cream and soon opened other factories in Washington, Boston, and New York. Such pioneer activities eventually

led to the adoption of new techniques of manufacturing and to the establishment of the ice cream industry.<sup>1</sup>

Frozen desserts originally were manufactured and marketed in relatively small quantities and were enjoyed by the more affluent portion of society. Improved methods of manufacturing and marketing have greatly lowered the costs of frozen dessert production and have increased the availability and popularity of these products among all segments of the population.

Ice cream was virtually the only important frozen dairy dessert until milk sherbet became established about 1935. In the years which immediately followed, milk sherbet gained a share of the frozen dessert market but never became a strong competition for ice cream. It was not until 1940 that ice milk was introduced as a frozen dairy dessert, both in its hard-frozen and soft-frozen forms. Until this time, virtually all frozen desserts had been sold in a hard-frozen form. This "new" frozen dessert was first popularized and promoted by Dairy Queen, a national soft-serve dairy product franchise, beginning in 1940. This company pioneered the concept of marketing soft-frozen desserts from a roadside dairy stand.

The sale of frozen desserts in a soft-frozen form did not, in the aggregate, account for an appreciable percentage of frozen dessert sales until the post-war years. By this time the dairy drive-in had gained such popularity that other franchise organizations and numerous

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<sup>1</sup>Hugo H. Sommer, The Theory and Practice of Ice Cream Making (Olsen Publishing Co.: Milwaukee, Wisconsin, 1932), pp. 1-3.

independent operators were establishing drive-in dairy stands. Previously established drive-ins acquired soft-frozen equipment to increase product offerings and sales.

Since our nation is literally "on wheels", most of the soft-frozen products are sold by drive-ins or roadside stands. From the soft-serve freezers, a product can be sold which meets the taste of almost every consumer. Products such as cones, cups, sundaes, milkshakes and even some novelties on a stick can be made from a single machine and sold directly to the consumer. In addition, most drive-ins also sell hard ice milk, having packaged the product and kept it in a hardening cabinet.<sup>2</sup>

The soft-frozen dessert industry in Oklahoma has experienced many of the same trends evident for the United States. The new concept of "roadside marketing" has had a substantial effect on expansion of the soft-frozen dessert industry in Oklahoma. When soft-frozen desserts were first introduced, there were approximately thirty manufacturers and dispensers of this product in Oklahoma.

Soft-frozen desserts accounted for only a very small percentage (probably one or two percent) of the total production of 3.6 million gallons of hard and soft frozen desserts in 1940. By 1964 there were 1,081 licensed manufacturers of soft-frozen desserts in Oklahoma and total soft-frozen dessert production amounted to 2.2 million gallons. This was 17 percent of the total production of 13.1 million gallons of frozen desserts produced in the state.

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U. S. Department of Agriculture, ERS, Production of Manufactured Dairy Products (Washington, 1955).

Ice cream never has been handled to any extent as a soft-serve product in Oklahoma. Since its introduction, ice milk has dominated Oklahoma's soft-frozen dessert market. In 1963, the soft-frozen market was divided as follows: ice milk, 91 percent; mellorine, 7 percent; and ice cream, 2 percent.

The soft-frozen dessert industry in Oklahoma has been expanding in the past and will very likely continue on such an upward trend in the future. Several factors which should increase soft-frozen dessert sales are: (a) increases in population, incomes, and automobile registrations; (b) the increasing tendency for people to "eat out"; and (c) increases among the teenage sector of our population (which presently accounts for 36 percent of all drive-in sales).<sup>3</sup> Improvements in highways and the construction of lakes and parks should increase the traffic flows within Oklahoma, thus providing potential customers to be reached by both the roadside stands and other frozen dessert sales outlets.

The objectives of this study were to determine the factors associated with successful operation of retail firms dispensing soft-frozen dairy products and to analyze the marketing practices associated with the procurement and sale of the dairy products in this segment of the Oklahoma dairy industry. In Chapter II, the methods and procedures used in the analysis are outlined. Analyses of firm attributes such as physical characteristics, product offerings, and labor and management practices are presented in Chapters III through V. Costs

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<sup>3</sup>Drive-In Management Magazine, 1963 Drive-In Operators Handbook (Ojibway Press Inc: Duluth, 1963), p. 7.

and returns of firms are considered in Chapter VI. Marketing practices for soft-frozen dairy products are analyzed in Chapter VII. Finally, the results are summarized in Chapter VIII.

## CHAPTER II

### METHODS OF ANALYSIS AND PROCEDURES

There were 1,081 firms with licenses in June, 1964, from the Dairy Division of the State Department of Agriculture to manufacture soft-serve products in Oklahoma. However, no records were available to indicate the quantity of dairy products manufactured, the marketing practices associated with these dairy products, and the relative importance of dairy products to firms engaged in this segment of the retail industry.

The firms dispensing soft-serve products generally are located in cities and towns and usually each city or town has at least one such firm. An area the size of Oklahoma is sufficiently large that regional differences as well as city size differences may be associated with firm sales, costs, and product offerings.

#### The Sample

A complete census of all licensed firms would have required more research resources than were available. Therefore, the decision was made to base the analysis on a sample of ten percent of the firms stratified by regions and city sizes. Regional stratification was accomplished by dividing the state into four regions (Figure I). The north-south boundary line generally followed the South Canadian River

from the eastern to the middle part of the state, then approximately straight west to the Texas border. The east-west boundary followed county lines but was approximately the route of U.S. Highway 81. The regions contained unequal areas and populations but were expected to reflect any differences associated with location within the state. Region I was the largest since it included both the Oklahoma City and Tulsa metropolitan areas.

Within each area, four sizes of cities were defined for the study. The city sizes were based on population and were as follows:

- size A - under 2,000 population
- size B - 2,000 - 9,999 population
- size C - 10,000 - 69,999 population
- size D - 70,000 and over population

The sampling procedure involved four steps. First, the firms were divided into regions as defined in Figure I. Second, the firms within each region were divided into city size groups. Third, the firms within each city size group were numbered consecutively and subdivided into groups of ten firms. Finally, a table of random numbers was used to select one firm and one alternate firm from each group of ten firms.

Personal interviews were conducted with the managers of each firm in the sample. When an interview could not be completed for the first firm selected, the alternate firm was used unless the first firm was no longer in operation. An "out of business" firm was considered as a sample firm. The locations of the firms included in the sample are shown as dots in Figure I.



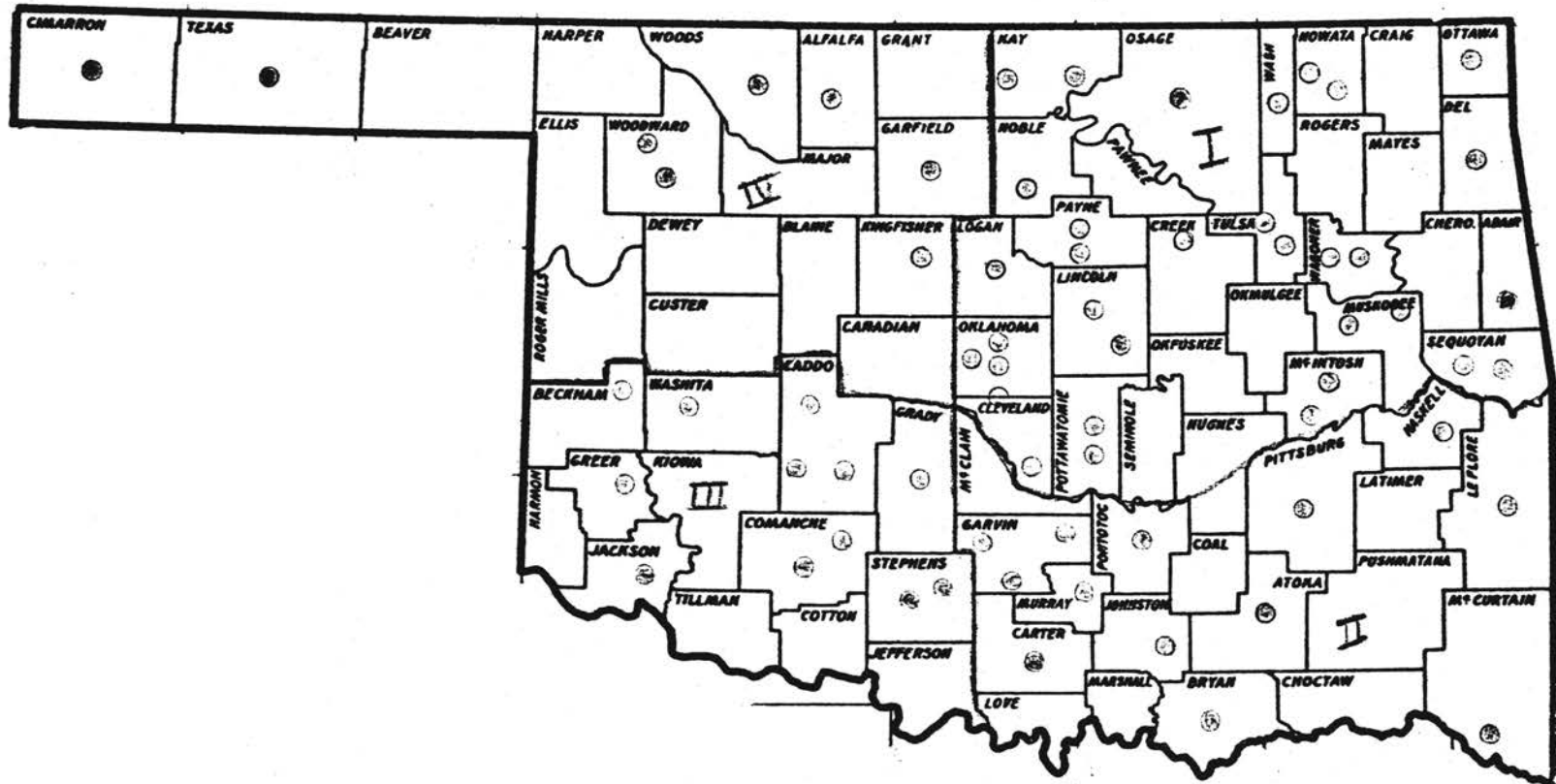


Figure 1. Delineation of Areas and Locations of Cities and Towns Included in the Sample.

## The Schedule

The schedule was developed from personal observations of physical characteristics and types of operation and from economic specifications of variables which appeared to be important to success in this retail segment of the dairy industry. The first schedule was pretested with the manager of a firm in Lincoln County. After modification based on the first interview, the schedule was pretested in interviews with firms in the Payne County Area. The schedule used for the study is included in Appendix B.

## Methods of Analysis

Two methods were used to analyze the data. The first method involved the comparison of averages for firms with different characteristics. Three major classifications of firms included the region, city size, and firm size. The first two of these classifications were specified before the sample was drawn; the last was constructed from the completed schedules. Firm size was defined in terms of man hours of labor rather than in terms of square feet of building space or gross sales. Because of the incidence of large numbers of part-time family and hired laborers, the size of the firms was based on man hours per week. An arbitrary division was used to divide the firms into four groups with ranges of total man hours per week as follows:

size 1 - less than 160 hours per week

size 2 - 160 hours-239 hours

size 3 - 240 hours-360 hours

size 4 - more than 360 hours per week

The three-way classification of firms by area, city size, and firm size could have resulted in 64 different groups of firms or an average of less than two firms per group with equal distribution of the 108 firms in the sample. Consequently, a hierarchical analysis of variance was completed to test for differences in the classification criteria. From this analysis it was determined that there was no statistically significant difference (at the one percent level) in the average gross sales among firms as associated with geographical areas (Appendix A, Table I). Therefore, the area data were pooled and the area classification was deleted from the analysis. The classification variables retained were city size and firm size.

The second method used in the analysis was linear multiple regression of the form  $Y = a + b_1x_1 + b_2x_2 \dots + b_nx_n$ . Weekly gross sales and dairy sales as a percentage of gross sales were used as alternative dependent variables in the regression analyses. A total of 22 independent variables was tested. The independent variables were selected, in part, on the basis of variables which appeared to be important in indicating differences among firms as determined by the first method of analysis. The number of firms involved in the multiple regression analysis was smaller than the number in the sample because of incomplete information on costs and sales of some firms and because of incomplete information for some of the independent variables.

## CHAPTER III

### PHYSICAL CHARACTERISTICS OF THE SAMPLE FIRMS

The physical characteristics of the firms in the study varied with firm type, size, and location. The extremes ranged from the family type of operation located in a small town or city fringe with minimum equipment investment, to the large-scale commercial type of operation for which soft-frozen dairy products were incidental to the success of the firm. As might be expected, there was more variation in building designs, equipment layout, and types of location for independent operators than for the franchised types of operations.

#### Firm Organization

The firms were classified into two groups with respect to type of ownership, independent and franchised. The independent firms represented the largest proportion of all firms, 75 percent. However, the proportion was not the same in all size groups. There was a tendency for the proportion of independent firms to decline as firm size increased. In size I, the smallest of the four size groups, 92 percent of the firms were classified as independent. In size IV, the largest group, only 58 percent of the firms were in this classification.

With respect to the type of business, there were three general types of firms represented in the sample. These were: (1) roadside stands and drive-in restaurants; (2) dining-room type restaurants; and (3) dairy products stores. Of the 108 sample firms, 85 were classified as drive-ins, 21 as dining-room type restaurants, and 2 were classified as dairy stores.

### Lot Location, Size, and Type

#### Location Within the City

Three classifications of general location were defined for the study. These were country, town and city fringe, and city downtown locations. Most of the firms were in the last two classifications; few firms had locations in the country. The ratio of fringe area to downtown area location was about two to one (Table I).

There was a relationship between location and firm size. Fringe area locations were relatively most important for the small and medium size firms. Ninety-two percent of the smallest firms were located in the fringe areas. In contrast, 65 percent of the largest firms were located in downtown city sections.

#### City Size

There was a tendency for the two smallest firm sizes to be located in the cities and towns with less than 10,000 population (Table I). The largest percentage of the size IV firms (42 percent) was located in cities of size C. Cities of size D contained the full range of firm sizes, but did not contain the majority of any firm size.

TABLE I  
 NUMBER OF SAMPLE FIRMS CLASSIFIED BY CITY SIZE,  
 LOCATION WITHIN CITY, AND FIRM SIZE, 1964

	Firm Size				Total
	I	II	III	IV	
<b>Location Within City</b>					
Downtown	0	16	5	12	33
Fringe	12	32	15	12	71
Country	<u>1</u>	<u>3</u>	<u>0</u>	<u>0</u>	<u>4</u>
Total	13	51	20	24	108
<b>City Size</b>					
A (under 2,000 persons)	8	14	4	0	26
B (2,000-9,999 persons)	1	13	7	6	27
C (10,000-69,999 persons)	1	13	5	10	28
D (70,000 and over)	<u>3</u>	<u>11</u>	<u>4</u>	<u>8</u>	<u>27</u>
Total	13	51	20	24	108

Population per firm was used as a measure of the number of non-transient customers which potentially could be served by each firm. There was a direct relationship between firm size and population per firm (Table II). The population concentration for the size IV firms was 65 percent greater than the small size establishments.

#### Traffic Density

The size of the potential market for products of the sample firms probably is related to the number of vehicles passing the firm location. Detailed traffic counts at each location were not available. However, the State Highway Department had estimates of traffic counts at specific points on State and Federal Highways for 1963. Use of these data permitted estimates of traffic counts for all except downtown locations. Generally, intracity traffic movements were not measured by these data.

TABLE II  
 SELECTED LOCATIONAL CHARACTERISTICS ASSOCIATED WITH  
 SAMPLE FIRMS, FOUR FIRM SIZES, 1964

	Firm Size				Average
	I	II	III	IV	
	(Number of Firms or Percent of Firms)				
Population per firm (1,000 persons)	1.12	1.41	1.47	1.85	1.46
Traffic count (vehicles per day)	3,200	6,470	6,620	6,450	5,680
Corner location (pct. of firms)	46	39	45	46	44.0
Lot size (square feet)	17,521	19,411	27,447	34,181	24,640
Paved lot surface (pct. of firms)	38	39	75	74	56.5
Car capacity (no. cars)	21	26	27	46	30.0

Only for the small size firm was the average daily traffic count different from the other firm sizes (Table II). The average traffic count for these firms was only about one-half the count for the other three size groups. The traffic volume for firms other than the smallest size averaged close to 6,500 cars per day.

#### Corner Location

Corner lots could be an asset to the firm because of the potential increased traffic flow past a corner location relative to a lot having front footage on only one street or highway. About 44 percent of the firms had corner locations, and about one-half of these were in downtown

locations. No relationship of firm size and a corner location was evident (Table II).

The average daily traffic count was 3,361 for firms having corner locations as compared with 3,294 for firms having front footage only. In terms of weekly traffic, firms having corner locations might have a slight advantage over firms with frontal locations--about 500 cars per week.

#### Lot Size

The average lot size included 24,640 square feet. This was equivalent to an inside lot with a frontage of 165 feet and a depth of 150 feet. There was considerable variation in lot sizes which appeared to be directly related to firm size. Lots for the largest size firms averaged almost twice as large as for the smallest sized firms (Table II).

#### Lot Surface

Slightly over one-half of the lots had paved surfaces of concrete or asphalt (Table II). Approximately 75 percent of the two larger sized firms had paved surfaces. Only 39 percent of the two smaller sized firms had such surfacing on their lots.

#### Car Capacity

Lot size and car capacity were directly related. The average car capacity for all firms was 30 and ranged from 21 for size I, up to 46 for size IV (Table II). Apparently car capacity per square foot increased slightly as the size of the lot increased. Decreasing space



requirements for buildings and open lanes per square foot of total area could have contributed to this relationship.

### Buildings and Improvements

#### Type of Construction

The majority of the buildings used by the firms in the sample were of concrete block construction. The proportion of buildings in this category was 57 percent (Table III). Wood buildings ranked next in importance and were used by 34 percent of the firms. Brick and metal buildings, respectively, accounted for the remaining nine percent. Buildings with the largest floor space were constructed of brick; those with the least floor space were housed in metal house trailers.

#### Floor Space

The area of the building averaged higher with each successive increase in firm size (Table III). Building sizes varied greatly between firm sizes as is evidenced by the more than 100 percent increase in floor area between sizes III and IV. The increase in floor space is directly related to the greater work and storage area required by firms of larger sizes with larger volumes of business.

#### Building Age

The average age of the buildings used by the sample firms was 8.2 years (Table III). There was no relationship between average age of building and the size of the firm. However, there were significant differences among firms as related to operations in buildings less than five years old. The smallest firm size group had a significantly

larger percentage of firms in the "new" building category. This indicates that new firms may enter the industry at a size smaller than the average for the industry.

TABLE III  
SELECTED CHARACTERISTICS OF BUILDINGS AND IMPROVEMENTS  
OF SAMPLE FIRMS, FOUR FIRM SIZES, 1964

	Firm Size				Average
	I	II	III	IV	
(Number or Percentage)					
<b>Buildings</b>					
Number of firms with bldgs. of					
Concrete block	4	29	12	17	1,314 <sup>a</sup>
Wood	7	18	4	4	738 <sup>a</sup>
Brick	0	2	3	3	1,907 <sup>a</sup>
Other	2	2	1	1	313 <sup>a</sup>
Average size (square feet)	730	839	1,033	2,086	1,172
Average age (years)	7.8	8.8	8.3	7.8	8.2
Pct. of firms with bldgs. less than 5 yrs.	46.2	25.5	20.0	33.3	31.3
<b>Improvements</b>					
Covered parking area					
Pct. of firms with covered parking	0	36.2	80.3	78.1	48.6
Average no. of cars covered	0	10.0	11.0	25.0	11.5
Intercom system					
Pct. of firms with intercoms	0	6.7	10.1	38.0	16.0
Average no. of units	0	11.0	14.0	35.0	15.0
Customer restrooms					
Pct. of firms with restrooms	8.2	12.7	30.4	40.6	22.9

<sup>a</sup> Average square feet of floor space.

## Additional Services

### Covered Parking Area

The proportion of firms having covered parking facilities was directly related to firm size, and covered facilities were used most frequently by firms having paved lots. About four-fifths of the size III and size IV firms had parking canopies. This compares with only one-third of the size II firms with canopies (Table III). None of the smallest sized firms had any type of covered parking spaces.

The average covered car capacity also increased as firm size increased. The average number of covered parking spaces was 11.5 for all firms (Table III). Capacity was highest for the largest firms, 25 vehicles.

### Intercom Systems

There was a direct relationship between firm size and the use of automatic ordering devices. The use of intercom systems was not widespread throughout the sample but occurred most frequently among the two largest sized firms. Intercom systems were used in 10 percent of the size III firms and in 38 percent of the largest sized firms (Table III). The average number of units among the largest sized firms was more than twice the average number of installations among the size III firms.

### Customer Restrooms

The percentage of firms having customer restrooms increased as firm size increased (Table III). This increase was related to the fact that more of the larger firms were of the restaurant type which were required by law to provide restrooms for customer use.

## Service Outlets

## Service Windows Only

More than one-half the sample firms used service windows exclusively for customer sales. The most frequent type was the roadside stand type of building having two service windows. This arrangement was used by 39 percent of all firms (Table IV). Other service window numbers ranged from one to four.

TABLE IV  
TYPES OF SERVICE OUTLETS USED BY SAMPLE FIRMS,  
FOUR FIRM SIZES, 1964

	Firm Size				Total
	I	II	III	IV	
(Number of Firms)					
Service Windows Only					
1 window	3	3	0	0	6
2 windows	5	23	7	7	42
3 windows	0	3	1	6	10
4 windows	<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>1</u>
Total	8	30	8	13	59
Service Windows and Interior Seating					
1 window	2	5	3	0	10
2 or more windows	<u>0</u>	<u>14</u>	<u>5</u>	<u>0</u>	<u>19</u>
Total	2	19	8	0	29
Interior Seating Only	2	3	2	2	9
Car-hop Only	0	1	2	6	9
Other	<u>1</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>2</u>
Total Firms	13	54	20	21	108

### Service Windows and Interior Seating

The next most common type of customer service arrangement was interior seating in addition to service windows. About 27 percent of all firms provided this type of service. The usual arrangement of this type included two or more service windows with facilities for seating customers at counters or tables. Many firms having such seating arrangements could be classified as restaurant type firms rather than roadside stand establishments.

### Interior Seating Only

Eight percent of the sample was composed of firms having only interior seating arrangements. Firms of this type were almost entirely oriented toward food and sandwich sales and used soft-frozen desserts only as a minor product offering in their restaurant-type businesses.

### Car-Hop Service Only

Firms depending solely on car-hop service also composed eight percent of the sample. These firms usually were large drive-ins located in the larger cities. Such firms were oriented toward root beer, soft drink, or sandwich sales and did not derive a large percentage of income from the sale of soft-serve products.

### Other Type of Service

The other major type of customer service was provided by the dairy stores. These firms concentrated on over-the-counter sale of fluid milk and frozen desserts in bulk form. Consequently, these firms did not provide any eating facilities for the customers.

### Types of Equipment

All firms had the same types of basic equipment, although the larger firms usually had a wider range of equipment because of the greater number of food products offered. Each firm, regardless of size, usually had the following equipment: (a) soft serve-freezer dispenser; (b) refrigerated storage; (c) frozen food storage; (d) soft drink machine; (e) ice machine; (f) malt mixer; (g) grill, (h) deep fryer; (i) coffee maker. The larger firm sizes which handled a wider range of product offerings often had additional equipment such as: (a) slush machines; (b) pizza ovens; (c) charcoal grills; (d) pressurized ovens; (e) milkshake machines; and (f) various labor-saving and food preparation devices.

#### Soft-Serve Freezer

All firms had some type of soft serve-freezer dispenser, and the average capacity was 6.1 gallons of soft-serve mix. The average capacity was directly related to firm size and was considerably greater for the larger firms than for the smaller firms (Table V).

More than one-third of firms in sizes III and IV handled a sufficient volume of soft-frozen desserts to require the use of two soft-serve machines. The combined capacities of such tandem arrangements varied from 7 to 10 gallons of soft-frozen dessert mix.

Continuous-freeze machines were used by many firms handling a greater than average weekly quantity of soft-serve mix. Virtually all of the franchised soft-frozen dessert firms used one or more of the continuous freeze-soft serve machines. These machines were attached to

a refrigerated bulk unit which provided a constant supply of mix. The average weekly quantity of soft-frozen mix handled by these firms was 118 gallons compared with an average of 62 gallons per week handled by firms not using continuous freeze equipment. Firms using such equipment composed 15 percent of the total sample. The highest percentage of these firms was in firm size III.

TABLE V  
CAPACITIES OF SELECTED EQUIPMENT ITEMS AND AVERAGE AGE OF  
EQUIPMENT USED BY SAMPLE FIRMS, FOUR FIRM SIZES, 1964

	Firm Size				Average
	I	II	III	IV	
	(Number of Firms)				
Soft-serve freezer (gallons)	4.6	5.3	6.9	7.6	6.1
Refrigerator capacity (cu. ft.)	19	20	36	39	29
Walk-in coolers (cu. ft.)	195	268	338	297	277
Food freezer capacity (cu. ft.)	18	26	26	33	26
Ice machine capacity (lbs. per 24 hrs.)	277	368	442	629	429
Equipment average age (yrs.)	6.3	5.3	4.9	4.7	5.3

#### Refrigerated Storage Equipment

All firms had some type of refrigerated storage capacity. The average was 29 cubic feet of capacity for all firms (Table V). Refrigerated storage capacity increased as firm size increased.

The larger sized firms usually had walk-in coolers in addition to small household refrigerators or small refrigerated cabinets connected with the fountain equipment. Walk-in refrigerated storage was used for storing mix, vegetables, and other supplies requiring refrigeration. Refrigerated capacity and the use of walk-in coolers was greatest for the larger firm sizes.

All firms had food freezers. Freezers were used most frequently for the storage of meats and pre-cut-french fried potatoes. The most common types of food freezers were the household chest-type and the typical chest-type ice cream cabinets. Food freezer capacity was directly related to firm size but did not vary greatly among the three largest sized firms (Table V).

#### Ice Machines

The average daily capacity of ice-making equipment increased with each successive increase in firm size. The average ice-making capacity for the largest firms was more than twice the capacity for the smallest sized firms (Table V). Three of the sample firms elected to purchase ice from a local ice plant rather than invest capital in ice-making equipment.

#### Age of Equipment

The average age of equipment was inversely related to firm size (Table V). The average age of all equipment used by the smallest firms was one-third older than equipment used by the largest firms. Some of the older ages of equipment resulted from the purchase of used equipment by the small firms.



## CHAPTER IV

### PRODUCT OFFERINGS

The major products sold by the firms were soft-serve items, hard-frozen items, sandwiches, and beverages. All firms handled some form of soft-serve products. Most of the firms handled hard-frozen desserts in addition to the soft-serve items, but often these were soft-serve products which had been hard-frozen after being dispensed from a soft serve-freezer dispenser. The sample included two dairy stores which placed primary emphasis on the sale of hard-frozen desserts and fluid milk. These two firms were almost wholly dairy-oriented and did not handle any type of hot sandwiches. Soft drinks, either in fountain or bottle form, were handled by all firms.

#### Soft-Serve Products

Soft-frozen ice milk or soft-frozen mellorine was served either in cups or in cones by all firms. To be considered soft-frozen, a product must be either sold direct from the soft-serve freezer or kept in a hardening cabinet for less than 12 hours. If kept in a hardening cabinet or room for 12 hours or more, it is considered hard frozen. Eighty-five percent of all firms dispensed their product in cones as well as in cups. Most firms used cups only in the serving of milkshakes and sundaes; however, fifteen percent of the operators served all soft-frozen desserts in cups and did not use cones in any form.

Soft-serve mellorine or Mello-Treat was sold by only two of the sample firms. Apparently this non-dairy product in its soft-frozen form is either not used or not recognized as being used by the soft-serve firms in Oklahoma. At the time of the sample, mellorine mix was manufactured in 20 of the 29 mix manufacturing plants in the state.

#### Hard-Frozen Dessert Products

Ten percent of the sample firms handled some form of frozen desserts in addition to soft-frozen products. Such products were dispensed from the soft-serve freezer and stored in a hardening cabinet for 12 hours or were distributed to the firm by a dairy route salesman. Of the four firm sizes, the greatest percentage of firms handling these products was for the small firms. Twenty-three percent of all size I firms handled some form of frozen dessert other than soft-serve product offerings. The corresponding percentages for the remaining three firm sizes were as follows: size II, six percent; size III, ten percent; and size IV, one percent. As firm size increased, there was a tendency toward firm specialization. The larger firms, especially the size IV group, concentrated on fewer product offerings, but strived for high-quantity sales in each product line. The two primary reasons which the operators listed for not handling hard frozen desserts were: (a) additional costs of frozen storage; (b) higher profit margins yielded by other product offerings.

#### Non-Dairy Products

There was no definite relationship between the average number of non-dairy product offerings sold by each respective firm and firm size

(Table VI). Hamburgers and hot dogs were the two basic types of sandwiches most commonly sold by the sample firms. All firms having food items sold hamburgers; however, not all firms served hot dogs. In addition, many firms served other types of hot and cold sandwiches. The average number of sandwiches served by all firms was 8.1. Firms of size III served an above average number of 9.1 types of sandwiches.

TABLE VI  
NUMBER OF NON-DAIRY PRODUCT ITEMS SOLD BY  
SAMPLE FIRMS, FOUR FIRM SIZES, 1964

	Firm Size				Average
	I	II	III	IV	
(Number of Items)					
Sandwich Offerings					
Average	7.5	7.6	9.1	8.1	8.1
Range	5-9	3-15	5-22	3-18	4-16
Beverage Offerings					
Average	5.1	5.1	5.6	5.4	5.3
Range	5-9	4-10	4-12	3-12	4-11

All firms served either fountain or bottled soft drinks. Each firm usually served two or three fruit-flavored soft drinks in addition to colas. The average number of soft drinks served by all firms was 5.3.

Thirteen of the sample firms served some form of hot plate meal, in addition to the beverage and sandwich offerings. Only one of these firms was included in the size I category. The remaining twelve firms were evenly distributed among the other firm sizes.

## CHAPTER V

### LABOR AND MANAGEMENT

The average work-day and work-week of the sample firms increased as firms size expanded. Daily hours of operation averaged 13.0 for all firms and ranged from 11.6 for the smallest firms to 13.9 hours for the largest firms. The increasing length of the work-day was also evident in the number of hours per week which the firms were open for business. Weekly hours of operation averaged 91.2 for all firms and ranged from 81.0 hours for the smallest firms to 101.0 hours for the largest firms.

There were no appreciable differences between the average number of work-days per week for the various firm sizes (Table VII). Ninety-four percent of all firms were open for business daily. A slightly smaller than average percentage (88.2) of size II firms were open daily, whereas all the smallest firms conducted business seven days per week.

The sample firms were delineated into firm sizes on the basis of total man hours per week. Therefore, each successive increase in firm size necessarily represented more man hours of labor than for the firms of the previous size group.

TABLE VII  
 DAYS AND HOURS OF OPERATION OF SAMPLE FIRMS,  
 FOUR FIRM SIZES, 1964

	Firm Size				Average
	I	II	III	IV	
	(Number or Percent)				
Firms Operating Seven Days Per Week (pct.)	100.0	88.2	94.8	92.1	93.7
Hours Per Day (no.)	11.6	12.7	13.6	13.9	13.0
Hours Per Week (no.)	81.0	88.1	94.5	101.0	91.0

#### Labor

##### Number of Workers

The organization of the sample firms ranged from small, family operations requiring only family labor, to the large, commercial businesses employing up to 25 persons. The average number of workers in all firms, including the manager was 8.5 (Table VIII). Firms of size I were operated by an average number of 2.9 workers as compared with the average of 19.7 workers employed by the average large firm. The percentage increase in number of workers between successive firm sizes was greatest between sizes III and IV. More than twice the number of workers was required to staff the size IV firms than was required by firms of size III.

##### Family Labor

The number of family workers remained relatively constant over all firm sizes. Therefore, the hours worked by family labor as a percentage

TABLE VIII

NUMBER OF EMPLOYEES, HOURS WORKED, AND LABOR COSTS  
FOR SAMPLE FIRMS, FOUR FIRM SIZES, 1964

	Firm Size				Average
	I	II	III	IV	
(Number of Firms)					
<b>Employees</b>					
Hired employees	0.2	1.3	4.2	17.2	5.7
Family workers	1.5	2.1	2.1	1.5	1.8
Total (incl. mgr.)	2.7	4.4	7.3	19.7	8.5
<b>Hours Worked (man-hours per week)</b>					
Manager	58	66	75	73	96
Other family	17	43	45	17	31
All workers	112	196	299	602	302
<b>Labor Costs</b>					
Wage per hour	\$ .67	.77	.83	.96	.81
Cost per week	\$ 126.50	198.37	298.42	617.88	310.29
Cost per dollar of gross sales	\$ .26	.24	.28	.28	.26

of total man-hours decreased as firm size increased. Family members supplied two-thirds of all labor in the smallest firm sizes but only 15 percent for the larger firms. The first two firm sizes could be classified as family-type businesses. It is estimated in the Drive-In Management magazine that 90 percent of all drive-ins (of which 94 percent of the sample is composed) could be called "mom and pop" businesses, having less than six full-time employees.<sup>1</sup> As firm size increased, labor requirements also increased. The larger firms usually required more labor than could be supplied by family members. The firm manager usually was the only family member connected with the larger firms.

#### Man-Hours

Man-hours per week more than quadrupled over the range of firm sizes. The average weekly manpower requirements per firm ranged from 112 man-hours for the smallest firms to 602 weekly man-hours for the largest firms. The average firm utilized 302 man-hours per week of operation.

#### Wages

Since the drive-in restaurant industry in Oklahoma has been exempt from all federal and state minimum wage legislation, employee wages were lower than the legal minimum wages in many industries. However, restaurant employees do not pay for meals eaten while on the job, as do

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<sup>1</sup>Robert Edgell, "As I See It", Drive-In Management (Milwaukee, 1964) p. 37.

employees of most other industries. Table VIII gives the hourly wage, averaged over both full-time and part-time employee salaries, by firm sizes. Employees of the size I firms received the smallest average wage, \$.67 per hour. The employees of firm sizes II, III, and IV received \$.77, \$.83, and \$.96, respectively, per hour. Workers hired as "inside help" generally were paid \$1.00 to \$1.50 per hour, whereas car-hops and miscellaneous helpers usually were paid \$.50 to \$1.00 per hour. However customer tips to car-hops, often more important than the nominal wage, were not included in the wage computations because no estimate could be obtained.

The average wage was computed from wage rates quoted by the manager of each respective firm in the sample. This wage was quoted as a net payment to the worker and appeared to be exclusive of social security and workmens' compensation payments by the firm.

#### Cost per Dollar of Gross Sales

Weekly labor costs per dollar of gross sales were computed by dividing total weekly labor costs by gross sales for each firm size (Table VIII).<sup>2</sup> The average labor cost per dollar of sales was \$.26. The cost varied from a low of \$.24 for firm size II to a high of \$.28 for firm sizes III and IV.

#### Management

The food industry, like other industries which derive all income from over-the-counter sales to the consumer, requires long hours of service.

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<sup>2</sup>Labor costs were computed on a firm size basis by multiplying the total number of hours of hired labor and family labor times the average wage per firm size. Management labor was valued at \$1.50 per hour.



This was especially evident in the man-hours contributed by the managers of the sample firms. As firm size increased, there was a general increase in total weekly man-hours contributed by the manager (Table VIII). This reflects the increasing size and complexity of the operation of larger firms and the supervision of a larger labor force.

#### Managerial Experience

There was not a consistent relationship between average managerial experience and firm size. The average number of years of managerial experience tended to increase as firm size increased, except for the size III firms which was almost as low as for the small firms. The managers of the largest firms had an average of 6.8 years experience in the food service industry, while the average for all firms was 5.1 (Table IX).

TABLE IX  
NUMBER OF YEARS OF EXPERIENCE AND TENURE OF MANAGERS OF SAMPLE FIRMS,  
FOUR FIRM SIZES, 1964

	Firm Size				Average
	I	II	III	IV	
	(Number of Firms)				
Years Experience	3.8	5.6	4.1	6.8	5.1
Number Managers with less than one year experience	3	12	2	3	5.0
Managers located at present location one year or less	5.0	18.0	6.0	6.0	8.5

There was an inverse relationship between firm size and annual turnover of management. More than one-third of the operators of the smallest firms had been in their current location for a period of one year or less as compared with only one-fourth for the largest sized firms (Table IX). The average turnover rate for the entire sample was 32 percent. A "conservative" estimate may be that the annual failure rate among drive-ins is between eight and ten percent.<sup>3</sup> From this, it might be inferred that approximately 20 percent of the annual turnover rate can be attributed to shifting of management from one firm to another firm within the industry.

In 1964 when the sample survey was conducted, there were 20 firm managers who had less than one year's experience in the food service industry. By 1965, five of these operators were no longer licensed to manufacture soft-serve products in Oklahoma. Such an annual failure rate, 25 percent, is slightly below the national rate. A 1963 University of Missouri restaurant study reports that "the number of people who enter the restaurant business and fail within the first year is about one-third".<sup>4</sup>

The average educational level of the manager was 12.7 years for the franchised firms, slightly greater than the corresponding figure of 11.8 years for the independent firms (Table X). Both types of firms were

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<sup>3</sup>Robert Edgell, "As I See It", Drive-In Management (Milwaukee, 1964) p. 37.

<sup>4</sup>C. H. Brachler, W. D. Alexander and J. M. Welch, Descriptive Analysis of the Missouri Restaurant Industry, University of Missouri Research Bulletin No. 843 (Columbia, 1963) p. 5.

TABLE X  
 NUMBER OF SAMPLE FIRM MANAGERS WITH SPECIFIED EDUCATIONAL  
 ATTAINMENT LEVELS, BY TYPES OF FIRM, 1964

Type of Firm	College Graduate	Some College Training	High School Graduate	Less Than 12 years Education	Total
	(Number of Managers)				
Franchise Firms	6	3	15	6	30
Independent Firms	<u>10</u>	<u>8</u>	<u>39</u>	<u>21</u>	<u>78</u>
Total	16	11	54	27	108

comparable in the percentages of (a) managers having some college work and (b) managers having a high school education only. There were seven percent more college-educated managers in the franchised firms than in the independent firms. The slightly higher educational attainment level of the managers of franchised firms was also evident at the lower end of the educational scale (managers having less than a high school education). About 27 percent of the independent managers did not graduate from high school, whereas the corresponding percentage for the franchised firms was 20 percent.

#### Education

The number of managers with specific levels of educational attainment is shown in Table XI. Almost one half of the operators in firm size I had less than a high school education. The percentage of such managers in the smallest firms is almost four times the percentage of the corresponding category among the size IV firms. In all other firm sizes, managers who had completed a high school education constituted the most frequent level of educational attainment. The percentage of

managers having college educations increased as firm size increased. The number of managers who had taken some college work but never attained a degree was inversely related to firm size. The percentage of managers with a high school diploma increased (more than doubled) between firm sizes I and IV.

#### New Firms

When the survey was taken, there were 1,081 licensed manufacturers of soft-frozen desserts in Oklahoma. By 1965 the corresponding number of manufacturers was 987, a nine percent decrease over the one-year period. This decrease in Oklahoma drive-ins is identical to the nine percent annual failure rate projected by Drive-In Management.

TABLE XI

NUMBER OF SAMPLE FIRM MANAGERS WITH SPECIFIED EDUCATIONAL ATTAINMENT LEVELS, FOUR FIRM SIZES, 1964

Level of Educational Attainment	Firm Size				Total
	I	II	III	IV	
	(Number of Managers)				
College Graduate	1	6	4	5	16
Some College Training	2	6	2	1	11
High School Graduate	4	23	11	16	54
Less than 12 years High School Education	<u>6</u>	<u>15</u>	<u>3</u>	<u>3</u>	<u>27</u>
Totals	13	50	20	25	108

There was no consistent relationship between firm size and the percentage of new entries (new firm with new building) into the industry in 1964. None of the size III sample firms had entered the industry in 1964. New units composed 7.7 percent of size I firms, 9.8 percent of size II firms, and 12.5 percent of size IV firms. Based on sample data, the annual growth rate of new units among the sample firms was 7.5 percent. The new-unit growth rate of this segment of Oklahoma's drive-in restaurant industry was somewhat below the national drive-in industry's rate of growth of about 10 percent per year.<sup>5</sup>

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<sup>5</sup>Drive-In Management Magazine, 1963 Drive-In Operators' Handbook (Ojibway Press Inc: Duluty, 1963) p.7.

## CHAPTER VI

### GROSS SALES AND COSTS

This study was not designed to determine the details of the cost structure and the associated economies of scale of the firms involved in dispensing soft-serve dairy products. However, data for a large number of variables were collected and used as approximations of the level of sales and costs for firms of various size classifications. The magnitude and variability of sales are first established in this chapter.

The demand for the products of the soft-serve dairy product industry is seasonal in nature. Therefore, the seasonality of sales is next analyzed. This is followed by an analysis of selected factors affecting gross sales.

Variable costs, fixed costs, and total costs for the sample firms are estimated and analyzed for the four firm sizes. Although some costs may be omitted, the costs used in the study appear to include the major items. Finally the firms were classified into three groups (high, medium, and low net returns as a percent of gross sales), and differences in selected characteristics for sales, physical facilities, labor, and management are analyzed.

## Gross Sales

### Annual Gross Sales

Complete annual gross sales and returns for the 1963 calendar year were available from 57 percent of all sample firms. Returns were reported in terms of gross returns before the deductions of taxes or depreciation.

Firm Size: Gross sales of all firms ranged from an annual low of \$9,700 received by one of the smallest firms, to a high of \$255,000 received by one of the largest firms. Five of the largest firms grossed over \$100,000 for the 1963 calendar year. Gross sales for all firms averaged \$48,235, with the median somewhat lower at \$37,244 (Table XII). The gross sales variation decreased considerably as size increased. The coefficient of variation for the smallest firms was more than four times greater than the corresponding value for the largest firms. About 44 percent of all firms had annual sales of less than the sample mean, and the average annual sales distribution was skewed to the right (Figure 2).

City Size: Average annual gross sales were positively correlated with city size (Table XII). Gross sales of firms in the largest cities were more than three times the sales of firms in the smallest cities. The variation in gross sales for city sizes was much less than for firm sizes. Gross sales of firms in the second largest city size had the widest

range of average annual sales. The coefficient of variation of sales among firms located in these cities was almost eight times as great as the coefficient of variation for firms in the metropolitan cities.

TABLE XII  
AVERAGE ANNUAL GROSS SALES OF SAMPLE FIRMS,  
BY FIRM SIZE AND CITY SIZE, 1964

Gross Sales	Firm Size				Average
	I	II	III	IV	
	(Dollars)				
Average	25,039	34,074	47,778	86,803	48,235
Median	12,400	33,500	44,200	78,374	37,244
Standard Deviation	23,835	17,450	18,597	19,840	19,931
Coefficient of Variation	95.2	51.2	38.9	22.9	52.1
	City Size				Average
	A	B	C	C	
	(Dollars)				
Average	27,063	38,818	64,874	88,159	54,729
Median	23,000	41,300	59,400	64,175	47,969
Standard Deviation	10,541	20,379	8,808	7,761	11,872
Coefficient of Variation	38.9	52.5	13.7	8.8	28.5



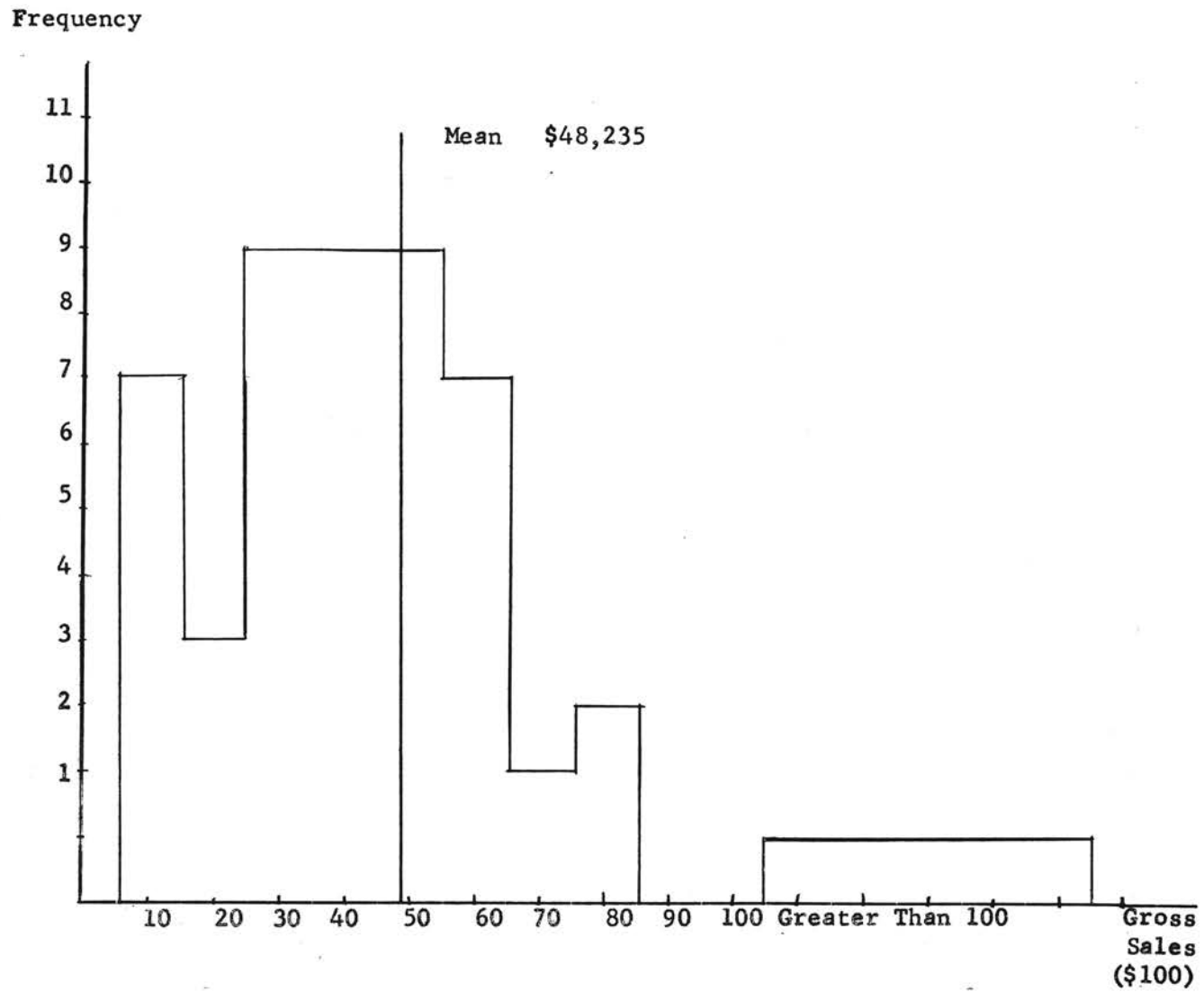


Figure 2. Annual Gross Sales Distribution of Sample Firms, Four Firm Sizes, 1964

## Monthly Gross Sales

Firm Size: Average monthly gross sales, computed from data furnished by 57 percent of the sample firms, increased as firm size increased. The monthly average for the largest firms was more than three times the average for the smallest firms (Table XIII). The standard deviation and the coefficient of variation for the monthly data reflect seasonal fluctuations in sales as well as fluctuations in sales among firms within each firm size. The coefficients of variation for all firm sizes were rather high, and ranged from a low of 62.6 for the size II firms to a high of 83.6 for the smallest firms.

Average monthly sales exhibited a definite seasonal pattern, at both the firm size and the aggregate levels (Figure 3). The sales distribution for all firms of sizes II, III, and IV encompassed a seven-month period of increasing sales from January to July, followed by a five-month period of decreasing sales. The smallest firms had a six-month period of increasing sales followed by decreasing sales throughout the next six months.

The small firms experienced the largest seasonal variation in sales. Total sales during the month of June averaged 114 percent greater than January sales for size I firms (Appendix A, Table II). Firms of size II experienced a relatively high seasonal variation with sales 80 percent higher in June than in January. The seasonal patterns for sales, of the smaller firms reflected the seasonality of dairy product sales. Dairy products represented almost one-third of total gross sales for firms of these sizes.

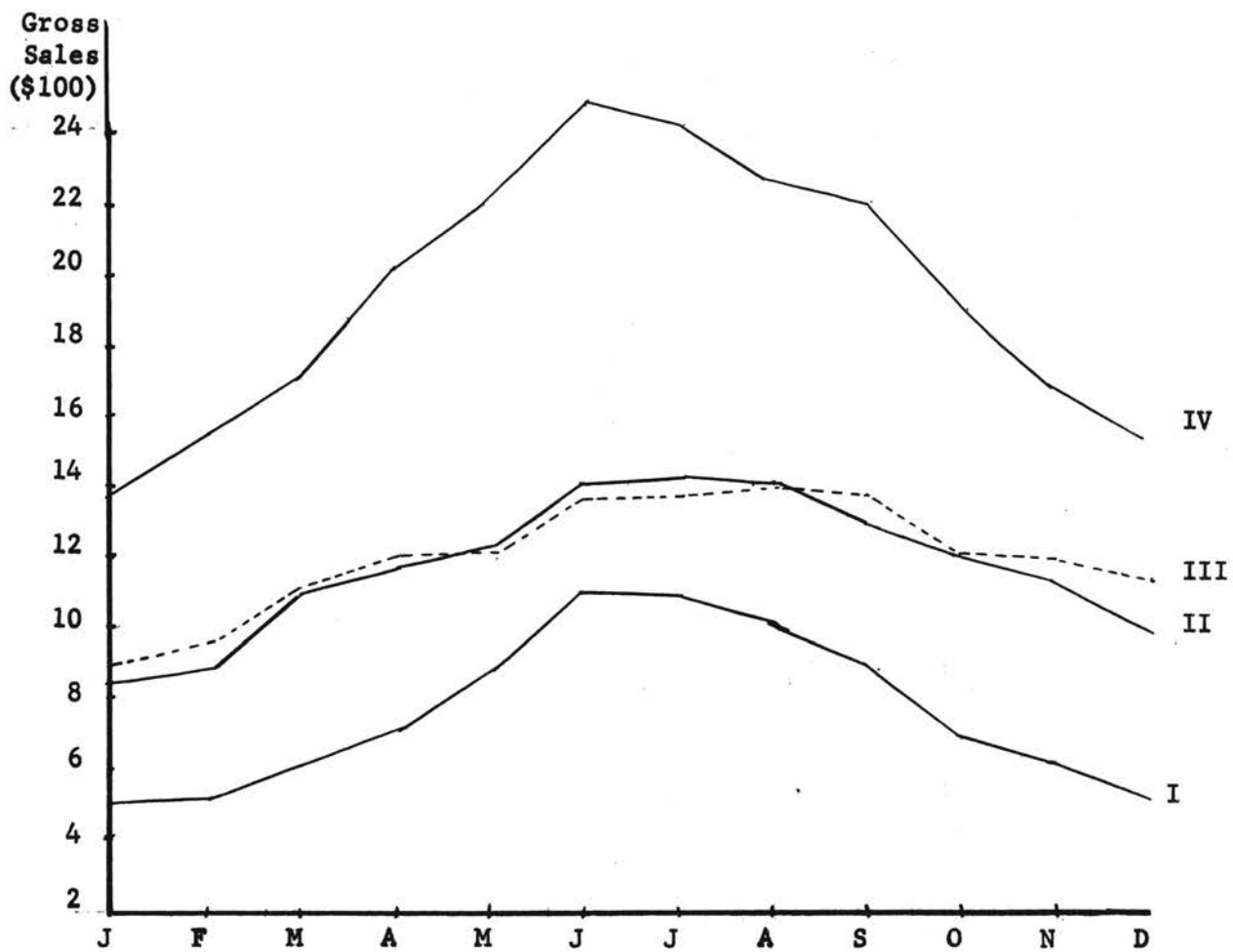


Figure 3. Seasonal Variation of Gross Sales of Sample Firms, Four Firm Sizes, 1964.

The larger firms experienced relatively less seasonal sales fluctuation than the smaller firms. June sales for the size III and IV firms averaged 50 and 73 percent, respectively, above January sales.

City Size: Monthly gross sales were also positively correlated with city size, partially because firm size and city size were correlated. Average monthly gross sales for firms located in the metropolitan cities were more than three times as great as for firms located in the smallest towns (Table XIII). The range of monthly gross sales was very high for firms in the smallest cities. The standard deviation for sales of firms in the smallest towns was greater than the mean, and the coefficient of variation was 184.7. The lowest coefficient of variation was 49.3 for firms in cities of the third largest size.

#### Dairy Product Sales

The seasonal pattern for dairy products sales was not as regular as the corresponding pattern for total sales for firms of a given size (Figure 4). One reason for the less regular pattern was the tendency for dairy product sales to be correlated with seasonal weather temperatures. Jacobson and Bartlett<sup>1</sup> stated:

There is a direct relation between mean temperature and per capita (dairy) sales. The increase in sales during higher temperature periods is frequently associated with purchasing by a larger percentage of all consumers, not merely more purchasing by year-round customers.

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<sup>1</sup>C. H. Brachler, W. D. Alexander and J. M. Welch, Descriptive Analysis of the Missouri Restaurant Industry, University of Missouri Research Bulletin No. 843 (Columbia, 1963) p. 12.

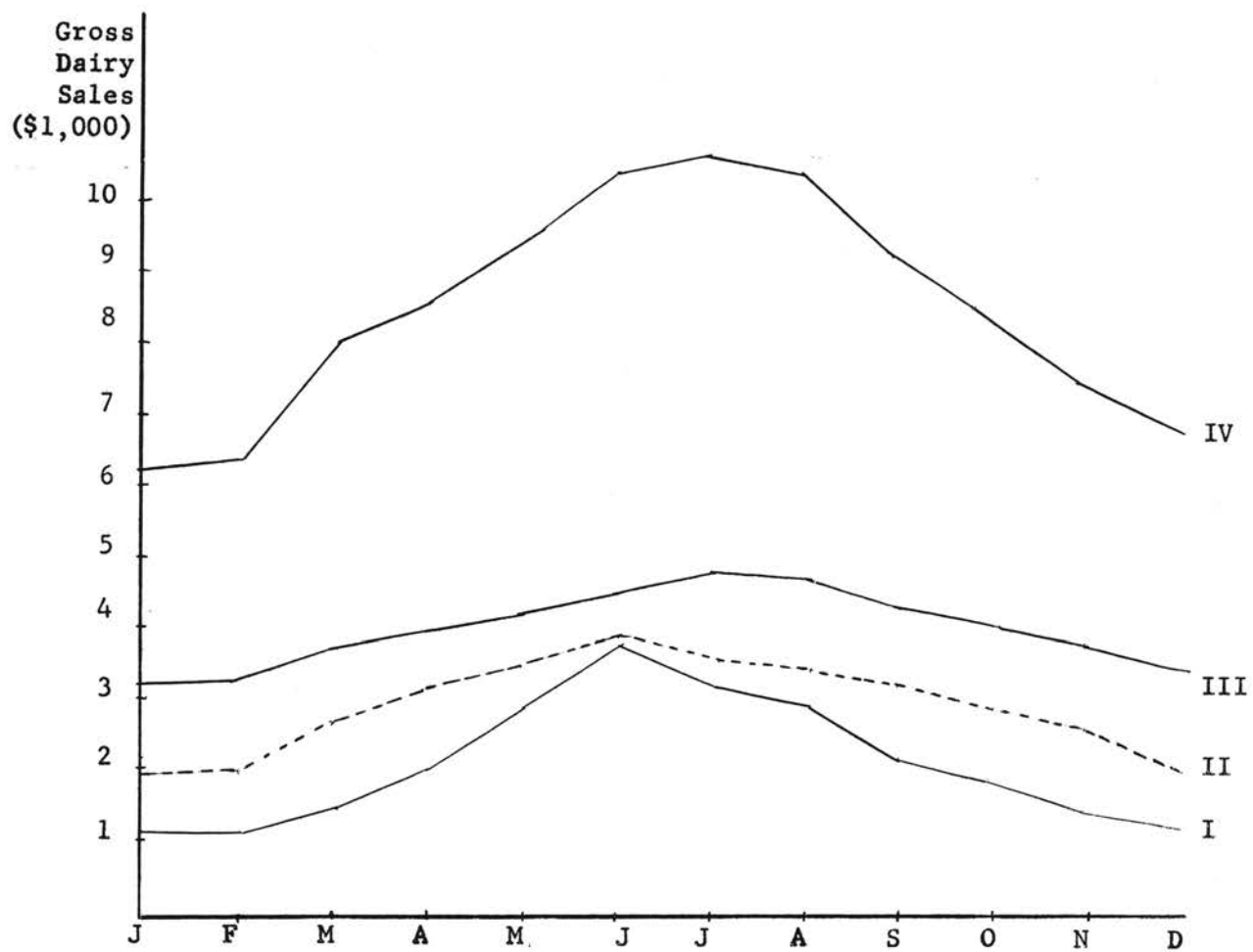


Figure 4. Seasonal Variation of Dairy Products Sales of Sample Firms, Four Firm Sizes, 1964.

TABLE XIII  
 AVERAGE MONTHLY GROSS SALES OF SAMPLE FIRMS  
 BY FIRM SIZE AND BY CITY SIZE, 1964

	Firm Size				Average
	I	II	III	IV	
	(Dollars)				
Average	2,086.58	2,891.96	3,981.45	7,233.58	3,598.39
Standard Deviation	1,745.14	1,946.46	1,491.69	5,625.60	2,702.22
Coefficient of Variation	83.6	67.2	62.6	77.8	72.8
	City Size				Average
	A	B	C	D	
	(Dollars)				
Average	2,108.00	2,407.14	5,615.50	7,349.31	4,519.99
Standard Deviation	3,894.07	2,092.56	2,769.48	6,530.06	4,966.50
Coefficient of Variation	184.7	86.9	49.3	88.9	102.5

The percentage change in average monthly dairy sales from the lowest to the highest month was greatest for the two smallest firm sizes. This reflected the seasonal pattern for total sales for these firms. However, the pattern may have resulted, in part, from the types of firms included in the various sizes. The proportion of roadside-stand type firms was 75 percent for the smaller firms as compared with 60 percent for size III firms and only 28 percent for the largest firm size.

Sales of dairy products as a percentage of gross sales declined as firm size increased. For the two smaller firm sizes, about one-third of the gross was attributed to dairy sales. The proportion was smaller

for the larger firms, 24 percent for the size III firms and 15 percent for the size IV firms. Differences in the importance of dairy sales to total sales would result in different seasonal patterns if dairy sales exhibited more seasonality than sales of other products.

#### Effects of Selected Factors on Gross Sales

A regression analysis was completed for gross sales data furnished by 83 of the 108 sample firms. A regression equation involving 83 observations was first formulated using 22 independent variables and one dependent variable. Traffic count was not used in this formulation because data were not available for all firms.

Dairy sales as a percent of gross sales was the dependent variable in the first equation but the results were not satisfactory because of negative coefficients and nonsignificant t-values. The next equation tested involved 67 observations and 18 independent variables including traffic count, with dairy sales as a percent of gross sales as the dependent variable. The  $R^2$  for this step was .99 but few of the t-values were significant. The third equation involved the original 22 variables, omitting traffic count, with weekly gross sales as the dependent variable. Some of the t-values for this equation were not significant, and  $R^2$  was .75. The regression coefficients and t-values for the three equations are presented in Appendix A, Table III. The simple correlation coefficients for the third equation are presented in Appendix A, Table IV.

From the third equation, six of the 22 independent variables were chosen from the standpoint of statistical significance and importance

as economic variables. Only five percent of the explained variation in gross sales was involved in eliminating the 16 independent variables. The final regression equation coefficients with individual "t" values in parentheses were as follows:

$$Y = -744.20 + .93X_1 + 276.94X_2 + 40.53X_3 + 129.67X_4 + 10.56X_5 - 222.07X_6$$

(2.31)\*
(2.87)\*
(2.81)\*
(8.23)\*\*
(1.71)<sup>5</sup>
(-1.63)<sup>6</sup>

$$R^2 = 70.0$$

Where:

Y = weekly gross sales (dollars)

X<sub>1</sub> = weekly gross sales from dairy only (dollars)

X<sub>2</sub> = city size

X<sub>3</sub> = floor space (100 sq. ft.)

X<sub>4</sub> = number of laborers (number)

X<sub>5</sub> = life of firm location (yrs.)

X<sub>6</sub> = population per firm (1,000 persons)

\* = significant at the 95 percent level

\*\* = significant at the 99 percent level

The regression coefficients indicate the increase in gross sales associated with a one unit increase in each independent variable, with the other variables held constant (statistically) at their mean levels).

The relationship between sales of dairy products (X<sub>1</sub>) and total sales was approximately 1:1. An increase of one dollar in the sale of dairy products was associated with an increase in gross sales of 93 cents. The coefficient was different from zero at the 95 percent confidence level but was not different from one.

City size (X<sub>2</sub>) was also directly associated with gross sales. Gross sales increased \$276.94 per week for each increment of city size



moving from A through D. The regression coefficient was statistically significant at the 95 percent level.

Floor space ( $X_3$ ) was also positively correlated with gross sales. Gross sales increased an average of \$40.53 per week for each 100 square foot increase in total floor space of the firms. The regression coefficient for this variable was significant at the 95 percent confidence level.

The number of laborers ( $X_4$ ) was directly related to the weekly gross sales of the firms. Gross sales increased by \$129.67 for each unit increase in the number of workers. The regression coefficient for this variable was significant at the 99 percent level. Also, it was approximately the same as average gross sales per worker of \$123.44.

Firm life ( $X_5$ ) was positively related to gross sales, but the regression coefficient of this variable was not significant at the 95 percent level. Taken at face value, weekly gross sales would increase by \$10.56 for each year of firm life.

The population per firm ( $X_6$ ) was the only variable which was negatively associated with gross sales. The coefficient indicated that gross sales would decrease by \$222.07 for each 1000 person increase in population per firm. This relationship was opposite the relationship expected. However, the coefficient was not statistically significant.

#### Selected Costs of Operation

Cost data were obtained for all firms. All costs were averaged on a component basis according to firm size. Variable costs were composed primarily of expenditures for labor, dairy products, meat,

soft-drink ingredients, and other factors directly related to the operation of a food service business. Fixed costs were composed of the expenses incurred in the use of lot, building, improvements, and equipment.

#### Variable Costs

Variable costs tended to fluctuate on a seasonal, monthly, weekly and daily basis. Variable costs in this study were computed on a weekly basis. Since the sample was taken during the summer months, the peak season for such businesses, the variable cost data reflected higher than annual average weekly costs for all variable factors of production.

Labor: There was a direct relationship between labor costs as a percent of total costs and firm size (Table XIV). Labor costs for firms of each size group labor valued at average wage rates for the groups, and manager's labor valued at \$1.50 per hour. Labor costs almost doubled over the full range of firm sizes. They increased from 25.8 percent of total variable costs for size I firms to 45.6 percent for size IV firms.

Dairy Products: There was an inverse relationship between firm size and variable costs associated with the dairy product segment of sales. As a percentage of total variable costs, the cost of dairy products decreased from 29.8 for the smallest firms to 7.2 for the largest firms (Table XIV). Soft-frozen dessert mix, however, did not follow the same trend.

TABLE XIV

AVERAGE WEEKLY VARIABLE COSTS FOR SAMPLE FIRMS, FOUR FIRM SIZES, SUMMER, 1964<sup>a</sup>

	Firm Size									
	Dollars					Pct. of Firm Size Total				
	I	II	III	IV	Average Dollars	I	II	III	IV	
Labor <sup>b</sup>	126.50	198.37	298.42	617.88	310.29	25.7	36.8	39.7	45.3	
Total Dairy Products	146.88	78.36	92.15	98.86	104.06	29.8	14.6	12.2	7.2	
Soft-Serve Mix <sup>c</sup>	36.55	66.71	81.51	86.49	67.82	7.4	12.4	10.8	6.4	
Soft Drink Syrup	31.39	69.14	64.35	152.24	79.28	6.4	12.0	8.6	11.2	
Meat	134.30	92.13	147.03	239.29	153.19	27.2	17.1	19.5	17.5	
Bakery Buns	14.35	30.32	56.82	74.11	43.90	2.9	5.6	7.5	5.4	
Paper Supplies	19.97	42.25	49.66	102.82	53.70	4.1	7.7	6.6	7.5	
Utilities	16.50	29.25	38.75	68.75	38.31	3.4	5.5	5.2	5.1	
Laundry (Uniforms)	<u>2.44</u>	<u>3.91</u>	<u>5.06</u>	<u>10.56</u>	<u>5.49</u>	<u>.5</u>	<u>.7</u>	<u>.7</u>	<u>.8</u>	
Total Weekly Variable Costs	492.33	538.73	752.17	1364.51	786.69	100.0	100.0	100.0	100.0	

<sup>a</sup> Costs were computed from data gathered during June-August, 1964, the peak sales season for drive-in restaurants.

<sup>b</sup> Included in Total Dairy Products.

<sup>c</sup> Includes imputed costs for family and managers labor.

Total expenditures for mix increased with firm size, but mix costs represented a decreasing share of total variable costs. Mix costs were 7.2 percent of total variable costs for the largest firm size. The divergence between expenditures for total dairy products and for mix by the smallest firms resulted, in part, from the inclusion of two dairy stores in this category. The lower percentages associated with dairy product costs for the larger firms probably resulted from the orientation of those firms toward a complete drive-in restaurant and away from the concept of a soft-frozen dessert stand.

Other Costs: Expenditures for meat composed almost one-third of the total variable costs for the smallest firms, compared with a corresponding percentage of about one-fifth for the remaining firm sizes (Table XIV). The ratio of meat to bakery bun expenditures was very high for the smallest firms; the reason for this was not apparent. Meat costs were among the three highest variable cost items for all firm sizes.

Soft drink syrup expenditures generally increased as firm size increased and ranged from six to 12 percent of total variable costs. They were greater than dairy product expenditures for the largest firm size.

Utility expenditures averaged 3.4 to 5.5 percent of total variable costs and were below average only for the smallest firm size. The same relationship of expenditures and firm size was evident for paper supplies as for utilities but the expenditure averaged higher, 4.1 to 7.7 percent of total variable costs. Laundry expenditures generally averaged less than one percent of total variable costs.

Total Variable Costs: Total variable costs averaged \$492 per week for size I firms and increased to an average of \$1,365 per week for size IV firms. For most of the firm sizes, variable costs represented from 62 to 66 percent of gross sales. They were smaller, 55 percent, only for the largest firm size.

#### Fixed Costs

Fixed costs usually were given in terms of annual or monthly costs. However, all fixed costs were broken down into weekly fixed costs in order to be comparable with weekly estimates of variable costs. Fixed costs included lot and building rents or investment costs; and equipment costs consisting of taxes, insurance, repairs, interest, and depreciation.

Building and Lot Costs: With each successive increase in firm size, there was a corresponding increase in building and lot investment (Table XV). Building investment included the cost of the building less the equipment. Lot investment included lot purchase costs, paving costs and other costs which the owner incurred to prepare the lot and parking area for business. Lot location accounted for a major portion of total lot investment. As firm size increased, the firm tended to locate in a more costly location, which caused lot purchase costs to increase with firm size. Lot investment was greater than building investment for all firm sizes except the smallest firm. This can be partially explained by the lot location. A small lot could not support larger sized firms; consequently, the lot represented a lower purchase cost and a lower total investment figure for size I firms.

TABLE XV

PERCENT OF FIRMS AND RENTS AND INVESTMENTS FOR BUILDINGS AND LOTS USED  
BY SAMPLE FIRMS, BY TYPE OF OWNERSHIP AND FIRM SIZE, 1964

Firm Size	Tenant	Part Owner	Full Owner
<b>Size I</b>			
Pct. of firms	54	15	31
Monthly Rental (dollars)			
Bldg.	100	--	--
Lot	70	80	--
Total	<u>170</u>	<u>80</u>	--
Investment (dollars)			
Bldg.	--	2,500	3,500
Lot	--	--	<u>2,500</u>
Total	--	<u>2,500</u>	<u>6,000</u>
<b>Size II</b>			
Pct. of firms	31	45	24
Monthly Rental (dollars)			
Bldg.	72	--	--
Lot	<u>133</u>	<u>120</u>	--
Total	205	120	--
Investment (dollars)			
Bldg.	--	4,794	4,650
Lot	--	--	<u>6,217</u>
Total	--	<u>4,794</u>	<u>10,867</u>
<b>Size III</b>			
Pct. of firms			
Monthly Rental (dollars)			
Bldg.	125	--	--
Lot	<u>157</u>	<u>158</u>	--
Total	282	158	--
Investment (dollars)			
Bldg.	--	5,000	4,833
Lot	--	--	<u>8,750</u>
Total	--	<u>5,000</u>	<u>13,583</u>
<b>Size IV</b>			
Pct. of firms			
Monthly Rental (dollars)			
Bldg.	180	--	6,286
Lot	<u>176</u>	<u>215</u>	--
Total	256	215	<u>6,286</u>
Investment (dollars)			
Bldg.	--	7,544	--
Lot	--	--	--
Total	--	<u>7,544</u>	--

There was not sufficient data for the size IV firms to obtain a representative average lot investment. Twenty-eight percent of the sample was composed of operators who owned both the building and the lot.

Investments and rents for the use of lots and buildings increased as firm size increased. Lot rent was greater than building rent for all except the smallest firms. This reflected the costs associated with location in the larger cities.

Operators who rented both the building and the lot composed one-third of the total sample, but almost one-half of the operators of the two smaller firm sizes rented both the lot and the building. Consequently, rent costs were used as typical fixed costs for firms in the industry. Rent may overstate fixed costs for those firms in which management owns both the lot and building, particularly if the facilities were acquired at price levels lower than 1964 levels. Combined building and lot rents ranged from an average of \$39.66 per week for the smallest firms to \$106.40 per week for the largest firms (Table XV).

Equipment Costs: Equipment investments were derived from data concerning purchase costs of all equipment and facilities which were necessary for food preparation, storage and handling. Supplementary equipment such as furniture, signs, and heating and cooling systems were not included in the investments. The total equipment investment quoted by each firm manager was given in terms of original equipment costs with no allowance for depreciation since the purchase date.

Average equipment investment was positively correlated with firm size. The average equipment investment for the smallest firm size was \$6,408. The two most expensive items used by the smallest firms were

the soft-serve freezer and the ice machine, and often composed one-third of the total equipment costs. Firms of size II had an average investment of \$10,139 or 58 percent greater than that for the smallest firms. These firms required machines of higher capacity, more refrigerated and frozen storage space, and more labor-saving equipment than did the smaller size firms.

Firm size III had an average equipment investment of \$12,790. This was only 26 percent greater than the corresponding investment for the size II firms and was less than one-half the increment in investment between the first two size groups. The average investment of size IV firms was \$20,600, an increase of 61 percent over the size III firms. The increased investment represented the use of (1) higher capacity machines, (2) speciality machines such as char-broilers, milkshake machines, and pizza ovens, and (3) certain labor-saving devices.

The major costs associated with equipment were depreciation, interest on investment, maintenance and repairs, insurance, and taxes. Depreciation on equipment was computed on a straight line basis using a ten-year average equipment life and a salvage value of ten percent of original equipment cost. Weekly depreciation costs for the size I firms averaged \$11.06 compared with a \$76.64 for the size IV firms (Table XVI).

Interest is a charge for the use of capital invested. The magnitude of such a charge will vary between firms and between different types of businesses, depending on the opportunity costs of using the capital in any specific use. For this study a rate of 6 percent of the annual equipment investment was assumed. This was equivalent to 3.3



percent of the initial investment over its useful life. Weekly interest charges were computed as \$4.05 for the smallest firms and \$13.04 for the largest firms (Table XVI).

Costs incurred through maintenance and repairs of firm equipment are highly variable and will depend on the age and condition of the equipment. They were assumed to be four percent per year of the initial equipment investment. Such a percentage figure for repairs is arbitrary, but it has been used for other segments of the dairy industry. Maintenance and repair costs averaged \$9.67 for all firms.

Equipment insurance costs were estimated on the basis of one percent of the original equipment investment. Weekly insurance costs ranged from a low of \$1.23 for the smallest firms to a high of \$3.95 for the largest firms.

The amount of tax assessment will depend largely on the particular location of the firm. For this reason it is difficult to generalize a specific cost for taxes. In this study, tax costs were computed from assessed values equal to 30 percent of the original investment and a tax rate of \$70 per \$1,000 valuation. Weekly tax costs ranged from \$2.58 for the smallest firms to \$8.29 for the largest firms (Table XVI).

Total: Total fixed costs averaged \$111.30 per week for all firms, but varied directly with firm size. They averaged \$63.50 per week for size I firms and increased to \$183.04 for size IV firms (Table XVI).

It was expected that fixed costs as a percent of gross sales would decline as firm size increased. However, there was little evidence to support this position. Fixed costs as a percent of gross sales was 7.8 for the largest firms, only slightly smaller than the 9.0 percent for

TABLE XVI  
 AVERAGE WEEKLY FIXED COST FOR SAMPLE FIRMS, FOUR FIRM SIZES,  
 SUMMER, 1964

	Firm Size				Average
	I	II	III	IV	
	(Dollars)				
Rent (lot & Bldg.)	39.66	47.18	65.80	106.40	64.76
Equipment Costs					
Taxes	2.58	4.09	5.15	8.29	5.03
Insurance	1.23	1.94	2.45	3.95	2.39
Repairs	4.92	7.78	10.17	15.80	9.67
Interest	4.05	6.42	8.09	13.04	7.90
Depreciation	<u>11.06</u>	<u>17.52</u>	<u>22.08</u>	<u>35.56</u>	<u>21.55</u>
Total	23.84	37.75	47.94	76.64	46.36
Total Fixed Costs	63.50	84.93	113.74	183.04	111.30

the smallest firms. Size III firms had the highest percentage of 11.1.

#### Total Costs

Total costs increased as firm size increased because of increases in both variable and fixed cost components (Table XVII). Moreover, the percentage increases were almost identical for both cost components as firm size increased. From the smallest to the largest firm sizes, variable costs increased by 177.2 percent and fixed costs increased by 173.5 percent. However, costs did not increase in proportion to the increase in gross sales. Total costs as a percentage of gross sales were lowest for the size II and size IV firms, and were highest for the size I and size III firms. Only in a very general sense, therefore, did costs decrease as a percentage of gross sales. Variable costs, fixed costs, and total costs are presented in graphical form in Figure 5.

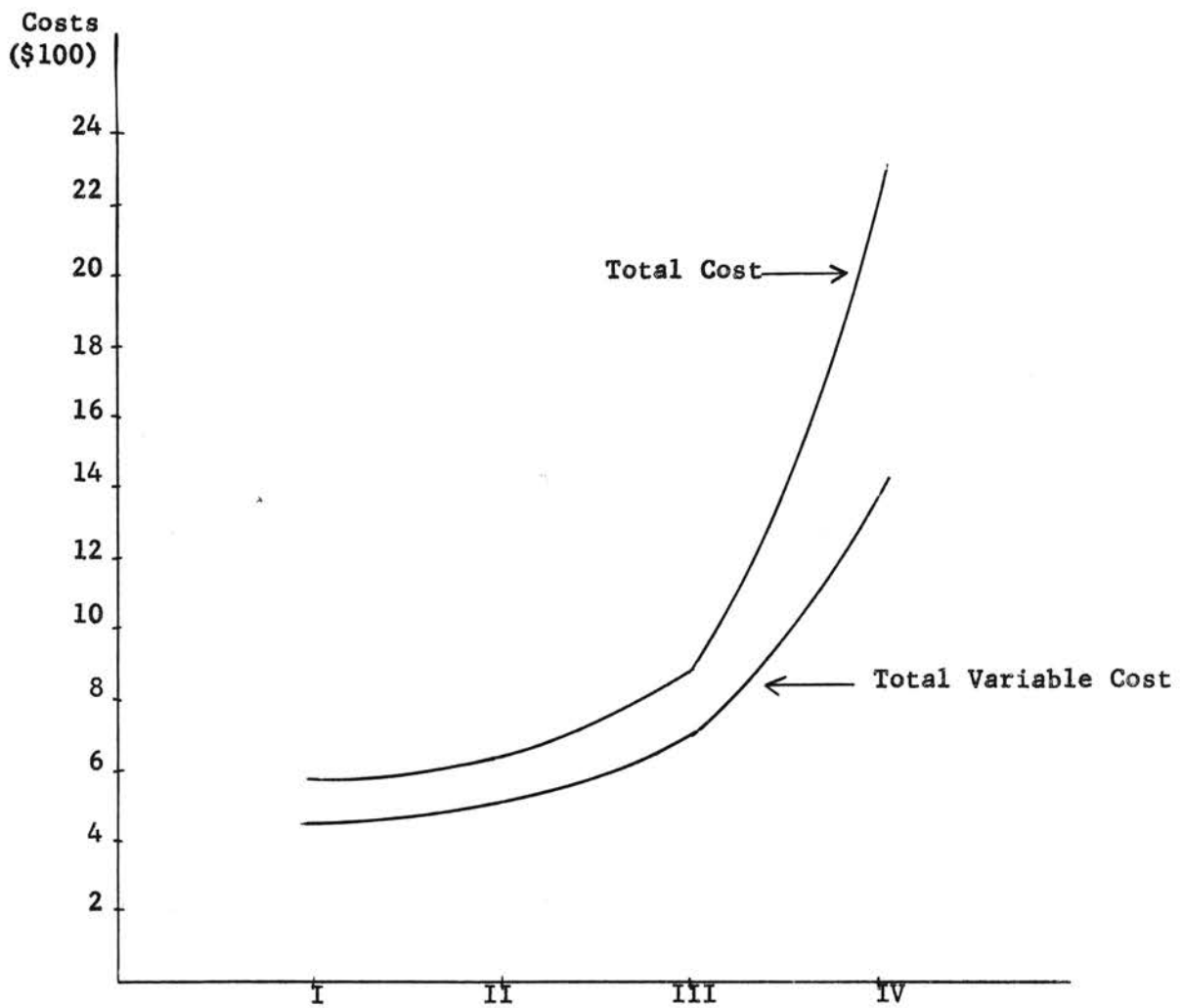


Figure 5. Total Variable Costs and Total Costs for Four Firm Sizes, 1964.

TABLE XVII  
 AVERAGE WEEKLY SALES AND TOTAL COSTS FOR SAMPLE FIRMS,  
 FOUR FIRM SIZES, SUMMER, 1964

	Firm Size				Average
	I	II	III	IV	
	(Dollars)				
Gross Sales	704.34	993.76	1022.92	2332.72	1263.37
Total Costs	555.83	623.66	865.91	1547.55	898.24
Net Returns Above Specified Costs	151.51	370.10	157.01	785.17	353.29
Percent of Gross Sales	(21.5)	(37.2)	(15.3)	(33.7)	(25.9)

#### Net Returns

Forty-six percent of the sample firms furnished data concerning net returns. Net returns as a percent of gross sales averaged 19.5 percent for all firms. This percentage corresponds very closely with a national estimate of over 20 percent.<sup>2</sup>

For analytical purposes, the firms were delineated into groups of firms having low, medium, and high net returns as a percentage of gross sales. Group I firms, those with low percentages, contained 16 firms with net returns averaging 11.9 percent of gross sales. There were 16 firms in the middle range with an average percentage of 18.2. Group III firms, those with the highest net returns as a percent of gross sales, contained 17 firms with an average percentage of 26.2.

<sup>2</sup>Robert Edgell, "As I See It", Drive-In Management (Milwaukee, October, 1963) p. 33.

The net returns of group I firms ranged from a low of 6.8 percent of gross sales to a high of 14.7 percent. There was no single factor which seemed to account for the low percentages for these firms. This group had the highest averages in managerial experience, population per firm, and percentage of franchised firms (Table XVIII). However, these firms were located in the smaller towns, associated with relatively new firms, located on unpaved parking lots, and limited in car parking capacity.

Net returns as a percent of gross sales for group II firms ranged from a low of 15.2 to a high of 20.9. Firms in this group had the highest average weekly gross sales and highest weekly gross sales from dairy products (Table XVIII). Firms in this group also ranked relatively high in other categories except managerial education, experience, and life of firm.

Net returns as a percent of gross sales for group III firms ranged from 21.3 to 36.0. Several factors appeared to be related to the high percentages for these firms, but few of the factors were greatly different from those for other firms. This group of firms had the largest car capacity, the greatest percentage of firms with paved parking lots, the largest floor space for buildings, the least investment in equipment, and the greatest number of weekly hours of operation. Relative to the other two groups, group II firms ranked high in the percentage of franchised firms and tended to be located in the larger cities.

The results of this three-way classification of firms according to net returns as percentages of gross sales were disappointing.

TABLE XVIII  
 SUMMARY OF SALES, FACILITIES, LABOR, MANAGEMENT AND OTHER  
 CHARACTERISTICS OF SAMPLE FIRMS CLASSIFIED BY THREE  
 LEVELS OF NET RETURNS, 1963<sup>a</sup>

	Group I Low Returns	Group II Medium Returns	Group III High Returns
	(Number or Percentage)		
Annual Net Returns as Percent of Gross Sales	11.9	18.2	26.2
Weekly Sales Characteristics			
Gross sales (dollars)	1,052	1,339	1,292
Dairy sales (dollars)	247	302	240
Dairy sales as percent of gross sales	25	28	26
Beverage sales as percent of gross sales	34	27	31
Other sales as percent of gross sales	41	44	42
Physical Characteristics			
Building size (sq. ft.)	832	811	1,126
Equipment investment (1000 dollars)	13.2	14.6	12.9
Car capacity	27	29	28
Paved lot (pct. of firms)	44	50	67
Covered parking area (pct. of firms)	9	11	8
Corner location (pct. of firms)	69	50	39
Interior eating area (pct. of firms)	38	20	33
Labor and Management			
No. of workers	8	7	8
Operation (hours/week)	90	92	94
Mgr. education (yrs.)	12.1	12.0	12.9
Mgr. experience (yrs.)	8.2	5.7	7.6
Other Characteristics			
Nat'l franchises (pct. of firms)	31	11	28
Life of firm location (yrs.)	5.3	4.8	7.0
Traffic count (100 cars/day)	41	32	38
Pop. per firm (1,000 persons)	1.66	1.48	1.43

<sup>a</sup>Based on data for 62 firms.

Clearcut conclusions could not be drawn regarding the selection of factors associated with the most profitable organization, location, and operation of firms.

## CHAPTER VII

### MARKETING PRACTICES FOR DAIRY PRODUCTS

Over the past 20 years, the production of soft-serve ice milk mix has increased by 90 percent (Table XIX). During this 20-year period, the number of plants manufacturing ice milk mix has fluctuated from a low of 18 in 1944 to a high of 43 in 1950 and 1951. In 1964 when the sample was conducted, ice milk mix was manufactured in 23 of the 29 frozen dessert plants in the state.

The concentration of firms in the ice milk industry was quite high during the early years of growth. The five plants with the largest production produced 88 percent of all ice milk in 1946. During the following years, the concentration decreased. The share of total production produced by the top five plants decreased to about 50 percent during the early 1950's. Since that time, the percentage for the top five plants has remained relatively stable. In 1964, the top five plants accounted for 52 percent of all ice milk mix production.

The locations of the mix manufacturing plants in 1964 are shown in Figure 6. The symbols represent the type of frozen products manufactured by each respective plant. Area I, the most populous area, contained 65 percent of all frozen dessert plants. Area III contained 19 percent of the plants, and areas II and IV contained four percent each.



- ☉ = ice cream
- = ice cream only
- ⊙ = ice cream, mellorine
- ◐ = ice cream, mellorine, mix
- ⊖ = ice cream, ice milk
- ⊕ = ice cream, ice milk, mix
- ⊗ = ice cream, mellorine, sherbet
- ⊘ = ice cream, ice milk, mellorine
- ⊙ = ice cream, ice milk, mix, sherbet

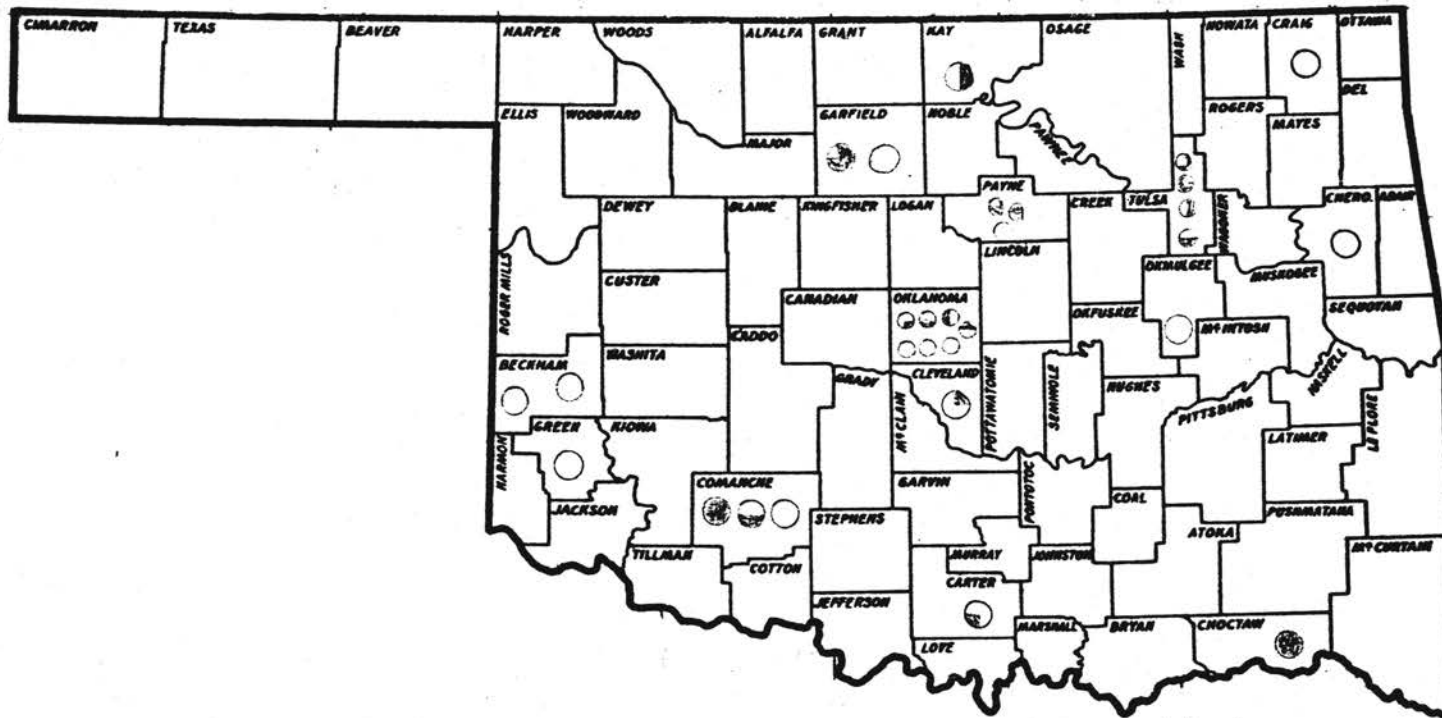


Figure 6. Location of Dairy Manufacturing Plants and Types of Products Manufactured

Source: Dairy Division, State Department of Agriculture

TABLE XIX  
OKLAHOMA ICE MILK MIX PRODUCTION, 1944-1964

Year	Number Plants	Production	
		Quantity (1,000 Gals.)	Percent Produced By Top Five Plants
1944	18	169	87.1
1945	21	587	49.8
1946	15	401	87.9
1947	23	109	67.7
1948	30	183	57.7
1949	37	312	50.6
1950	43	409	55.2
1951	43	537	51.1
1952	40	594	49.4
1953	34	661	48.6
1954	31	978	50.1
1955	40	955	48.4
1956	33	1,209	63.4
1957	35	1,298	63.8
1958	33	1,425	59.3
1959	32	1,758	57.3
1960	24	1,806	30.2
1961	20	2,089	53.2
1962	24	2,289	55.1
1963	23	2,478	51.5
1964	23	2,508	52.1

Source: Furnished by Statistical Reporting Service, U. S. Department of Agriculture, Oklahoma City, Oklahoma.

### Procurement of Mix

The sample firms purchased soft-serve mix on a daily delivery basis from 10 of the 23 Oklahoma mix suppliers and from four out-of-state suppliers. The marketing areas of the mix suppliers were characterized by irregular, overlapping boundaries. Figure 7 depicts the approximate marketing area of each mix supplier from which the sample firms purchased their mix. Each arrow is drawn to scale, and represents a product flow from the mix producer to the particular location of each purchaser. The market areas are approximated since the sample encompassed only 10 percent of all purchasers of soft-serve mix.

### Prices of Mix

Mix prices paid by the sample firms ranged from a low of 90 cents per gallon to a high of \$1.00 per gallon. The average price of mello-rine mix was 91.5 cents per gallon as compared with the overall average for all mix of 95.8 cents. However, only two firms used mellorine mix. The average quantity of all mix used by the sample firms was 71 gallons per week.

There was some relationship between firm size and the average mix price (Table XX). The lower prices were paid by the largest firms, and the highest prices were paid by size III firms. The smallest firms used 45 fewer gallons per week than the size III firms; however, the average mix price for these firms was less than the mix price for the size III firms. The largest firms used 10 gallons per week more, but paid 5.2 cents per gallon less than the size III firms.

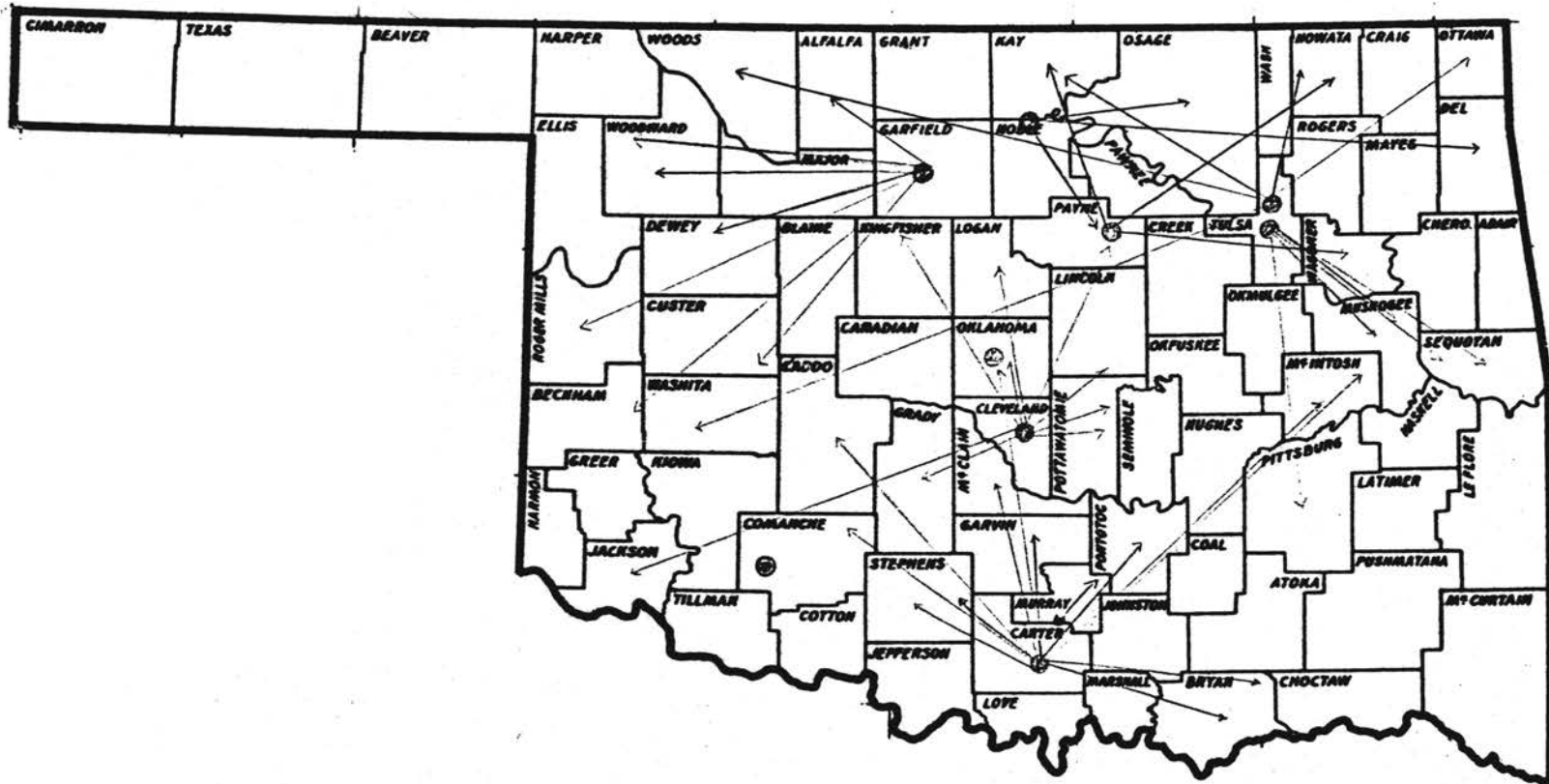


Figure 7. Market Areas of Oklahoma Mix Manufacturers Based On Sample Firm Purchases for Soft-Serve Distribution.

TABLE XX

MIX COSTS AND RETURNS FOR SAMPLE FIRMS, FOUR FIRM SIZES, 1964

	Firm Size				Average
	I	II	III	IV	
	(Dollars of Number)				
Cost (dol. per gallon)	\$ .965	\$ .954	\$ .982	\$ .930	\$ .958
Quantity Used (gal. per week)	38	71	83	93	71
Returns (dol. of dairy sales per gal. of mix)	\$2.29	\$3.26	\$3.10	\$2.92	\$2.89
Standard Deviation	\$1.43	\$1.25	\$1.09	\$1.75	\$1.34

## Variation in Weights of Soft-Serve Product Offerings

Sixteen of the 108 firms in the sample did not dispense any soft-frozen dessert products in cone form. Ten of these firms were included in the firm size IV classification, therefore, 42 percent of all size IV firms did not sell soft-serve products in cone form. This reflected the tendency of the larger firms to concentrate on offering a small line of sandwiches and soft-frozen desserts in milkshake form. The soft-serve products generally were sold as complementary items to sandwich sales. Soft-frozen desserts were sold in cone form by most of the firms in sizes I, II and III (92, 94 and 98 percent, respectively).

Prior to each interview and unknown to the individual owner or operator, the interviewer purchased and weighed a ten cent cone of the

soft-frozen dessert sold by each firm. Weights in grams were collected on 107 cone samples. The number of cones weighed did not necessarily coincide with the total number of firms in the sample. There were two reasons for this difference. First, all firms did not serve soft-frozen desserts in cone form as discussed previously. Second, a few firm managers did not grant an interview after the cone was purchased.

There are several factors which could cause a fluctuation in the weight of dispensed soft-frozen desserts. Such factors include: (a) efficiency of machine operation; (b) the amount of air which is added to the mix; (c) experience of employees; (d) sales promotions; and (e) number of competitors in the immediate area. There are no state or federal laws which regulate the amount of soft-frozen dessert dispensed into the various cone sizes. The rather loose standards or "benchmarks" used by most firms probably stem from the recommendations and standards used by leading national soft-frozen dessert franchises. The great majority of the sample firm operators indicated that they attempted to dispense 6.0 to 6.5 ounces of soft-frozen dessert into each ten cent cone.

The mean and median weights of the sample cones reflect this standard; both were 142 grams or 6.45 ounces. There was, however, much variation among the total number of observations. The largest sample cone weight, 198 grams or 9.0 ounces, was 102 percent heavier than the smallest cone which weighed 98 grams or 4.45 ounces. The standard deviation of the 107 observations was 19.6 grams or almost one full ounce.

Cones typically were served in sizes from five cents (2.5 ounces) to twenty-five cents (13 ounces) and cups were served in sizes from

ten cents (4.5 ounces) to forty cents (16 ounces). Assuming (1) that each product offering is sold at an excess of one ounce (the standard deviation of the cone sample) above the weight standard for each respective product offering, and (2) that each firm sells 4,500 gallons of soft-frozen dessert mix annually, the firm would utilize an excess of 136 gallons of mix above the optimum amount. Such an excess would represent a difference of approximately \$130 in the annual variable mix cost of the firm.

It appeared that some firms used the excess weight practice as a form of advertising. However, the extent of this practice as a form of advertising was not evaluated. If the market for additional volume existed, the excess product valued at retail prices would represent \$1,000 in foregone gross sales of the firm. Therefore, more careful weighing of soft-serve product offerings could be significant in the management of such enterprises.

#### Gross Sales per Gallon of Mix

The average gross sales of dairy products per gallon of mix was \$2.89 for all firms, but the variation was large (Table XX). The standard deviation was \$1.34 equivalent to a 46 percent variation about the mean. The size II firms had the highest gross sales of dairy products per gallon of mix. Firms in this size group grossed 25 percent more per gallon of mix than the smallest firms. The variation was smaller for size II firms than for other firm sizes. Size II firms had the smallest average gross sales per gallon of mix, but these firms also had the highest standard deviation (\$1.79).

**Estimated Total Value of Dairy Products Sold By  
Soft-Frozen Dessert Firms in Oklahoma**

In June, 1964, there were 1,081 firms in Oklahoma licensed to manufacture and dispense soft-frozen desserts. The northeast quadrant of the state, area I contained more than one-half of all manufacturers (598). Such concentration of firms could be attributed to the concentration of the state's population in this particular area (approximately 40 percent) and the higher traffic counts within this area.<sup>1</sup> Areas II, III and IV contained 198,153, and 132 firms respectively.

During the four-month period in which the sample was conducted, the quantity of soft-frozen dessert mix used by the sample firms was 18.6 percent above the annual average. Expansion on the basis of the sample data would result in an estimate of approximately 3.5 million gallons of mix used by the Oklahoma soft-frozen dessert industry in 1964. Assuming a 33 percent over-run, the Oklahoma soft-serve firms dispensed approximately 4.6 million gallons of soft-serve products. The estimate would be 7.0 million gallons if the over-run were 50 percent.

Total gross sales and gross sales of dairy products were also computed from the sample data. Based on averages for firm sizes within areas, the statewide gross returns for all firms which manufacture and dispense soft-frozen desserts direct to consumers amounted to approximately \$77 million. The sale of frozen dairy desserts, including mellorine represented \$15 million or 19 percent of the total.

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<sup>1</sup>Oklahoma State Department of Highways



The percentages of estimated gross sales and estimated frozen dessert sales were positively correlated with firm size and related to the geographical area of the state (Tables XXI and XXII). Size IV firms accounted for the largest percentage of gross sales of the frozen dessert industry in Oklahoma; however, the size II firms accounted for the largest percentage of sales of frozen desserts. Area I accounted for more than one-half of both gross sales and sales of frozen desserts. The shares of gross sales and sales of dairy products by the frozen dessert industry were about equal in the two western areas of the State and both were larger than in the southeastern area.

TABLE XXI

ESTIMATED SHARES OF GROSS SALES IN THE SOFT-SERVE DAIRY PRODUCTS  
INDUSTRY, BY FIRM SIZE AND GEOGRAPHICAL AREA, 1964

Area	Firm Size				Area Totals
	I	II	III	IV	
	(Percent)				
1	1.6	19.3	13.6	27.7	62.2
2	1.4	4.3	3.5	7.0	16.2
3	.6	5.0	3.5	7.0	16.1
4	.6	3.7	1.2	0.0	5.5
Firm Size Totals	4.2	32.3	21.8	41.7	100.0 <sup>a</sup>

<sup>a</sup>The estimated total was 77 million dollars.

TABLE XXII

ESTIMATED SHARES OF GROSS SALES FROM DAIRY PRODUCTS IN THE  
SOFT-SERVE DAIRY PRODUCTS INDUSTRY, BY FIRM SIZES AND  
GEOGRAPHICAL AREA, 1964

Area	Firm Size				Area Totals
	I	II	III	IV	
	(Percent)				
1	2.7	24.8	11.8	20.6	59.9
2	2.1	6.4	3.1	5.9	17.5
3	1.1	6.2	2.6	5.1	15.0
4	1.0	4.7	1.9	0.0	7.6
Firm Size Totals	6.9	42.1	19.4	31.6	100.0 <sup>a</sup>

<sup>a</sup>The estimated total was 15 million dollars.

## CHAPTER VIII

### SUMMARY AND CONCLUSIONS

The soft-serve dairy product industry in Oklahoma, since its inception in the 1940's, has grown to be an important outlet for milk supplies and frozen desserts. In 1963, over 1,000 firms in Oklahoma were licensed to manufacture and market soft-serve products.

This study represented an attempt (1) to determine the magnitude of the soft-serve dairy products industry, (2) to analyze the marketing practices associated with the procurement and sale of dairy products in this segment of the Oklahoma dairy industry, and (3) to analyze the factors contributing to the successful operation of retail firms dispensing soft-frozen desserts. The study was based on data obtained by personal interviews with managers of firms in a 10 percent sample of retail soft-frozen dessert manufacturers located throughout Oklahoma.

In terms of firm organization, three-fourths of the firms in the sample were non-franchised, independent businesses. There was a direct relationship between firm size and several of the physical characteristics of the firms. The larger firm sizes tended to be located in the larger cities, on larger lots, and in downtown sections. A larger percentage of these firms had paved lots, covered parking areas, intercom systems, and customer restrooms. The predominant type of service outlet

was a concrete block building with service windows for walk-up or drive-by delivery of food and beverage items. Except for the use of car-hops, there was little relationship between firm size and type of service outlet. Equipment capacity varied directly with firm size. Also, the larger firms had more items of specialized equipment such as continuous freeze-soft serve machines, milkshake machines, slush machines, and charcoal broilers.

In terms of product offerings, all sample firms served soft-serve ice milk or mellorine either in cones or cups. Sandwiches were sold by 98 percent of all firms. Many of the dairy stands had added sandwiches to their product offerings within the past few years. The addition of sandwiches by such firms reflects the trend away from the drive-in dairy stand and toward the complete drive-in restaurant. Because of this trend, soft-serve products have become less important relative to gross sales of the drive-in businesses.

Firm size was delineated on the basis of man-hours; therefore, labor requirements necessarily increased as firm size increased. Hourly wages also increased as firm size expanded, but labor cost per dollar of gross sales was about equal for all firm sizes. The hourly wage rate for all employees in sample firms was 81 cents per hour, excluding tips. Based on the number of new firm entrants and new managers, the annual growth rate of Oklahoma's drive-in industry was 7.5 percent compared with the national industry average of 10 percent. The failure rate of the inexperienced managers was somewhat below the national average. From 1964 to 1965, 25 percent of the "new" managers had a business failure, compared with a national failure rate of 33 percent among managers in their first year of business.

Gross sales data for 1963 were obtained from about one-half of the sample firms. Annual gross sales increased as firm size increased and averaged \$48,235 for all firms. The median for gross sales was \$37,244, and compared with the average, indicated skewness. About 44 percent of all firms had less than average gross sales. Monthly gross sales were highly seasonal, and the smallest firms experienced the greatest seasonality. The coefficient of variation for the smallest firms was 83.6 compared with the average of 72.6 for all firms. The seasonality of dairy products was somewhat greater than the seasonality of total gross sales. Regression analysis indicated that gross sales of dairy products ( $X_1$ ), city size ( $X_2$ ), floor space of building ( $X_3$ ), and the number of workers ( $X_4$ ) all were positively correlated with the gross sales ( $Y$ ). The regression coefficients for these variables were significant at the 95 percent level. Contrary to expectations, population per firm was inversely related to gross sales, but the coefficient was not statistically significant.

Variable costs for all factor inputs averaged 61.6 percent of gross sales for all firms. Only for the largest firm sizes was the percentage lower than the average. The major components of variable costs were labor, meat, dairy products and soft-serve mix, and soft-drink ingredient costs. Fixed costs increased as firm size increased but were approximately constant as a percentage of gross sales. Total costs increased as firm size expanded. Estimated net returns averaged 26 percent of gross sales and the percentages were higher for the size II and size IV firms than for firms of sizes I and III.

Forty-six sample firms were grouped according to low, medium, and high net returns as a percent of gross sales. Twenty-one characteristics were compared in an attempt to find differences among the three groups. The firms in the group having comparatively high net returns were located in larger buildings, in larger cities, had less equipment investment, and had greater car capacity on paved lots. Generally the results from this analysis were disappointing.

The sample firms purchased soft-serve mix on a daily-delivery basis. The average price of mix for all firms reporting was \$.958 per gallon, and the largest firms had the lowest price of \$.93. However, some firms quoted nominal prices since they regarded their mix prices as confidential. In 1964, there were 29 soft-frozen dessert manufacturing plants in the state. The sample firms purchased soft-serve mix from 10 of these firms and from four out-of-state suppliers. The market areas of suppliers based on the sample data were very irregular and overlapping. There was no evidence of increasing concentration in the mix-manufacturing industry.

Most operators indicated that they attempted to serve an average of about 6 ounces of soft-serve product in a 10 cent cone. The sample of weights substantiated this fact since the average weight of 107 cones was 6.45 ounces. However, the variation was large and the standard deviation was almost one full ounce.

About 7.0 million gallons of soft-serve products were retailed by the soft-serve drive-in industry, based on the sample data and a 50 percent over-run factor for the mix. Estimated sales of soft-serve dairy products represented 15 million dollars or 19 percent of

the dairy industry. Based on growth in the mix manufacturing industry, the drive-in industry will continue to expand. Such growth will reflect increasing population with increasing incomes and the trend toward more people eating away from home more often.

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**APPENDICES**

**APPENDIX A**

## APPENDIX A, TABLE I

SELECTED STATISTICS FROM HIERARCHIAL ANALYSIS OF VARIANCE OF GROSS SALES  
108 FIRMS, 1964

<u>Classification</u>			
<u>Criteria</u>	<u>df</u>	<u>Sum of Squares</u>	<u>Mean Squares</u>
Total	61	828,696,240.19	
Area	3	15,058,471.01	5,019,490.33
City Size	9	225,299,388.10	25,033,265.34
Firm Size	16	390,051,713.04	24,378,232.06
Error	33	198,286,668.05	6,008,686.91
<u>F Tests</u>	<u>df</u>	<u>F Value</u>	
Area vs. Error	3-33	0.835	
City vs. Error	9-33	4.166**	
Firm vs. Error	16-33	4.223**	

\*\*Empirical F value significant at 99 percent level.

APPENDIX A, TABLE II  
 MONTHLY GROSS SALES OF 62 SAMPLE FIRMS,  
 FOUR FIRM SIZES, 1963

Month	Firm Size				Average (Dollars)
	I	II	III	IV	
	(Dollars)				
January	1,133.33	1,879.32	3,122.00	6,240.10	3,093.69
February	1,133.33	1,950.03	3,141.28	6,435.00	3,164.90
March	1,300.00	2,558.35	3,539.86	7,950.83	3,837.26
April	1,944.00	2,924.80	3,828.07	8,527.36	4,306.06
May	2,799.00	3,301.16	4,148.02	9,543.19	4,947.84
June	3,423.00	3,414.87	4,370.41	10,281.72	5,372.50
July	3,144.66	3,582.77	4,677.91	10,432.89	5,459.56
August	2,962.33	3,577.87	4,632.18	10,399.92	5,393.08
September	2,332.66	3,444.45	4,415.03	9,055.34	4,811.87
October	1,866.66	3,121.74	4,206.19	8,300.00	4,373.65
November	1,666.66	2,865.77	4,044.63	7,575.25	4,038.08
December	1,333.33	2,082.41	3,657.22	6,638.32	3,427.82

APPENDIX A, TABLE III

REGRESSION COEFFICIENTS AND t VALUES FOR THREE REGRESSION EQUATIONS

Variable	Equation No. 1 Y X <sub>3</sub> (Dairy Sales Pct.)		Equation No. 2 Y X <sub>3</sub> (Dairy Sales Pct.)		Equation No. 3 Y X <sub>1</sub> (Gross Sales)	
	Reg. Coeff.	t Value	Reg. Coeff.	t Value	Reg. Coeff.	t Value
Gross Sales		X <sub>1</sub>				
Dairy Sales (Dollars)		X <sub>2</sub>			1.816	3.392
Dairy Sales (Pct. of Gross)		X <sub>3</sub>			19.904	.469
Beverage Sales (Pct. of Gross)	X <sub>4</sub>	-.940 -32.442	X <sub>4</sub>	-.970 -32.442	X <sub>4</sub>	36.934 .848
Sandwich Sales (Pct. of Gross)	X <sub>5</sub>	-.970 -54.149	X <sub>5</sub>	-.970 -54.149	X <sub>5</sub>	37.752 .889
City Size	X <sub>6</sub>	-.631 - 2.017	X <sub>6</sub>	-.631 - 2.017	X <sub>6</sub>	267.443 2.624
Car Capacity	X <sub>7</sub>	.008 .588	X <sub>7</sub>	.008 .588	X <sub>7</sub>	-2.734 -.584
Paved Lot <sup>a</sup>	X <sub>8</sub>	.036 .076	X <sub>8</sub>	.036 .076	X <sub>8</sub>	-19.630 -.131
Covered Stalls <sup>a</sup>	X <sub>9</sub>	-.004 -.117	X <sub>9</sub>	-.004 -.117	X <sub>9</sub>	7.014 .624
Corner Location	X <sub>10</sub>	-.368 - 1.009	X <sub>10</sub>	-.368 - 1.001	X <sub>10</sub>	-28.293 -.208
Bldg. Size	X <sub>11</sub>	1.057 2.618	X <sub>11</sub>	1.057 2.618	X <sub>11</sub>	456.698 2.790
Interior Eating Area <sup>a</sup>	X <sub>12</sub>	-.571 - 1.522	X <sub>12</sub>	-.571 - 1.521	X <sub>12</sub>	-126.710 -.867
No. Service Outlets	X <sub>13</sub>	.566 1.826	X <sub>13</sub>	.566 1.826	X <sub>13</sub>	100.693 .755
No. Laborers	X <sub>14</sub>	-.024 - .362	X <sub>14</sub>	-.024 - .362	X <sub>14</sub>	80.145 2.732
Weekly Hrs. Operation	X <sub>15</sub>	.003 .163	X <sub>15</sub>	.003 .163	X <sub>15</sub>	-8.914 -1.297
Franchised Firm <sup>a</sup>	X <sub>16</sub>	-.040 - .086	X <sub>16</sub>	-.040 - .086	X <sub>16</sub>	-103.164 -.573
Mgr. Education	X <sub>17</sub>	.163 1.931	X <sub>17</sub>	.163 1.931	X <sub>17</sub>	9.089 .311
Mgr. Experience	X <sub>18</sub>	.047 1.210	X <sub>18</sub>	.047 1.210	X <sub>18</sub>	-11.406 -.759
Life of Firm Location	X <sub>19</sub>	-.279 - .441	X <sub>19</sub>	.028 - .441	X <sub>19</sub>	33.295 -1.623
Traffic Count	X <sub>20</sub>	.005 1.149	X <sub>20</sub>	.005 1.149		
Pop. per Firm	X <sub>21</sub>	-.032 - .121	X <sub>21</sub>	-.032 - .121	X <sub>21</sub>	-292.996 -1.816
Equipment Investment	X <sub>22</sub>	-.026 - .869	X <sub>22</sub>	-.026 - .869	X <sub>22</sub>	10.812 .881
		n 83 R <sup>2</sup> .99		n 67 R <sup>2</sup> .99		n 67 R <sup>2</sup> .75

<sup>a</sup>Data was listed as yes or no.

APPENDIX A, TABLE IV

SIMPLE CORRELATION COEFFICIENTS FOR 21 VARIABLES, 83 SAMPLE FIRMS, 1964

Variables	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>	X <sub>5</sub>	X <sub>6</sub>	X <sub>7</sub>	X <sub>8</sub>	X <sub>9</sub>	X <sub>10</sub>	X <sub>11</sub>	X <sub>12</sub>	X <sub>13</sub>	X <sub>14</sub>	X <sub>15</sub>	X <sub>16</sub>	X <sub>17</sub>	X <sub>18</sub>	X <sub>19</sub>	X <sub>20</sub>	X <sub>21</sub>
X <sub>1</sub> Gross Sales (\$)	1.00	.31	-.40	.04	.33	.40	.35	.34	.59	-.04	.44	-.11	.20	.78	.21	.09	.14	.22	.22	.35	.64
X <sub>2</sub> Dairy Sales (\$)		1.00	.39	-.07	-.30	.24	.36	.08	.15	.06	-.10	-.07	.30	.20	.18	.26	.07	.23	.23	.21	.29
X <sub>3</sub> Dairy Sales (% of Gross)			1.00	-.15	-.78	-.08	-.03	-.14	-.39	.15	-.30	-.12	.12	-.46	-.20	.18	-.07	-.01	.13	.08	.27
X <sub>4</sub> Beverage Sales (% of Gross)				1.00	-.51	-.13	.12	-.01	.18	-.03	-.17	-.01	.08	.15	-.34	.13	-.35	-.11	-.09	-.13	.05
X <sub>5</sub> Meat Sales (% of Gross)					1.00	.15	.04	.14	.22	.13	.38	.10	-.15	.31	.37	-.25	.29	.08	-.05	.14	.20
X <sub>6</sub> City Size						1.00	.15	.37	.24	.02	.11	-.17	.09	.27	.02	.17	.21	.28	.22	.79	.23
X <sub>7</sub> Car Capacity (No. of Cars)							1.00	.09	.63	.01	.12	-.08	.21	.39	.06	.21	-.02	.00	.04	.14	.39
X <sub>8</sub> Paved Lot <sup>a</sup>								1.00	.27	.13	.24	-.16	.14	.37	.05	.21	.17	.29	.17	.36	.24
X <sub>9</sub> Covered Stalls <sup>a</sup>									1.00	.10	.34	-.07	.07	.69	.17	.07	-.05	.07	.09	.23	.57
X <sub>10</sub> Corner Location <sup>a</sup>										1.00	-.05	.01	-.15	.03	-.11	.06	-.03	.11	.15	.12	.08
X <sub>11</sub> Bldg. Size (100 sq. ft.)											1.00	.08	-.16	.42	.22	.02	-.07	-.05	-.07	.20	.27
X <sub>12</sub> Inside Eating Area												1.00	-.29	-.08	.15	-.27	-.15	-.08	-.04	-.20	-.04
X <sub>13</sub> Service Outlets (No.)													1.00	.16	-.09	.27	-.00	.04	.04	.11	.29
X <sub>14</sub> Employees (No.)														1.00	.33	.05	.09	.24	.22	.31	.73
X <sub>15</sub> Operation (Hrs. per week)															1.00	.13	.12	.22	.19	-.01	-.12
X <sub>16</sub> Nat'l Franchise <sup>a</sup>																1.00	.09	.05	.10	.18	.18
X <sub>17</sub> Mgr. Education (years)																	1.00	.09	.05	.05	.01
X <sub>18</sub> Mgr. Experience (years)																		1.00	.71	.33	.30
X <sub>19</sub> Firm Life (years)																			1.00	.31	.23
X <sub>20</sub> Pop. Per Firm (1,000 persons)																				1.00	.29
X <sub>21</sub> Equip. Investment (\$1,000)																					1.00

<sup>a</sup>Data was listed as either yes or no.

**APPENDIX B**

C O N F I D E N T I A LFrozen DessertOKLAHOMA STATE UNIVERSITY  
Agricultural Economics  
Department

Enumerator \_\_\_\_\_

Date \_\_\_\_\_

1. Name of Firm \_\_\_\_\_ Manager \_\_\_\_\_
2. Firm Address \_\_\_\_\_
3. Management
  - a. Manager ( ), owner-operator( ), or other( ) specify \_\_\_\_\_
  - b. Full time( ), or part-time( ).
  - c. Experience: at this location \_\_\_ years; In this type business \_\_\_ years
  - d. Education: \_\_\_\_\_ years
4. Location:
  - a. Downtown( ); country( ); or fringe--incoming( ) from \_\_\_\_\_  
outgoing( ) to \_\_\_\_\_
  - b. Highways \_\_\_\_\_
5. Lot:
  - a. Corner( ) or front only( ); rent \_\_\_\_\_  
cost \_\_\_\_\_
  - b. Size; front \_\_\_\_\_ depth \_\_\_\_\_; Total square feet \_\_\_\_\_
  - c. Car capacity \_\_\_\_\_, Number under cover \_\_\_\_\_  
Type of cover \_\_\_\_\_
  - d. Intercom system: yes( ); no( ). If yes, number of units \_\_\_\_\_;  
cost installed total \_\_\_\_\_ or per unit \_\_\_\_\_
6. Building:
  - a. Type: concrete block( ); wood( ); brick( ); other( )  
specify \_\_\_\_\_
  - b. Size: \_\_\_\_\_ by \_\_\_\_\_ or total square feet \_\_\_\_\_  
(circle the front dimension).
  - c. Number of service windows for customers \_\_\_\_\_ for car hops \_\_\_\_\_
  - d. Age \_\_\_\_\_ years; rent \_\_\_\_\_  
or cost \_\_\_\_\_
  - e. Restrooms provided for customers: Yes( ) No( ).
  - f. Remodeled in last 5 years: Yes( ); No( ). If yes, year \_\_\_\_\_;  
cost \_\_\_\_\_; purpose \_\_\_\_\_



7. Months and Hours of Operation of Business:

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Open												
Close												
Total Hrs.												

8. Labor:

	Age Group*	Sex	Hours Worked			Per Day	Per Week	Wage Rate
			Time					
			Begin	End				
Manager								
Family								
1								
2								
3								
4								
5								
6								
Hired								
1								
2								
3								
4								
5								
6								
7								
8								

\* A = adult

B = 16-20

C = under 16

9. Equipment

a. Total investment \$ \_\_\_\_\_, after allowing for depreciation?

Yes( ), No( )

b. Utilities: electricity \_\_\_\_\_ water \_\_\_\_\_ gas \_\_\_\_\_  
(last billing)

Selected Items	Capacity	Age	If Purchased:		
			Used	New	Cost
Soft Freezer					
Brand					
Frozen storage					
Refrigerator					
Malt mixer					
Milk dispenser					
Dip cone warmer					
Fudge warmer					
Cold drink machine					
Ice crusher					
Deep fryer					
Grill					
Hot dogger					
Coffee maker					

## 10. Soft-frozen Product Offerings:

	Price(s)	Weight of Dairy Ingredients		
		Unit	Soft (oz.)	Milk (oz.)
Cones, plain				XX
Cones, other				XX
Sundaes				XX
Shakes				
Malts				
Packaged:				
Pints				XX
Quarts				XX
1/2 Gallon				XX

## 11. Product Offerings of other Frozen Dairy Products:

	Price(s)	Type of Product		
		Ice Milk	Mellorine	Ice Cream
Pints				
Quarts				
1/2 Gallon				
Other				

## 12. Product Offerings of Nonfrozen Products:

	Price or Price Range	Number of Flavors or Variations
Milk	_____	_____
Coffee	_____	_____
Soft Drinks	_____	_____
Slushes	_____	_____
Hot Dogs: Regular	_____	_____
Foot Long	_____	_____
Hamburgers: Regular	_____	_____
Long	_____	_____

Sandwiches	_____	_____
Plate Dinners	_____	_____
Other	_____	_____
Vending Machines	_____	_____
Cigarette	_____	_____
_____	_____	_____
_____	_____	_____

13. Procurement Practices:

<u>Item</u>	<u>Weekly Quantity</u>	<u>Price Per Unit</u>	<u>Frequency of Delivery</u>	<u>Name and Address of Supplier</u>
Mix:				
Type: Ice Milk ( ); Ice Cream ( ); Mellorine ( ); Fresh ( ); Sterile ( ).				
Malt Mix	_____	_____	_____	_____
Milk	_____	_____	_____	_____
Frozen Dairy Prod.				
Ice Cream, pkg.	_____	_____	_____	_____
Ice Milk, pkg.	_____	_____	_____	_____
Mellorine, pkg.	_____	_____	_____	_____
Novelties	_____	_____	_____	_____
Soft Drink Syrup				
Dr. Pepper	_____	_____	_____	_____
Coca Cola	_____	_____	_____	_____
Pepsi	_____	_____	_____	_____
Seven-Up	_____	_____	_____	_____
Root Beer	_____	_____	_____	_____
Other Flavors	_____	_____	_____	_____
Bakery Buns				
Hot Dog - Reg.	_____	_____	_____	_____
Hot Dog - Lg.	_____	_____	_____	_____
H. B. - Reg.	_____	_____	_____	_____
H. B. - Lg.	_____	_____	_____	_____
Meat Items				
Hamburger	_____	_____	_____	_____
Hot Dogs - Reg.	_____	_____	_____	_____
Hot Dogs - Lg.	_____	_____	_____	_____
Fish	_____	_____	_____	_____
Barbeque	_____	_____	_____	_____

Other Items

Ice	_____	_____	_____	_____
Cones	_____	_____	_____	_____
Shake Cups	_____	_____	_____	_____
Sundae Cups	_____	_____	_____	_____
Soft Drink Cups	_____	_____	_____	_____
Hot Drink Cups	_____	_____	_____	_____
Napkins	_____	_____	_____	_____
Straws	_____	_____	_____	_____
Other Groceries	xxx	xxx	xxx	_____
Other Nongroc.	xxx	xxx	xxx	_____
Laundry, Uniforms	xxx	_____	_____	_____

(\$ per wk.)

14. Gross Sales

a. Monthly in 1963

Jan.	_____	May	_____	Sept.	_____
Feb.	_____	June	_____	Oct.	_____
Mar.	_____	July	_____	Nov.	_____
April	_____	Aug.	_____	Dec.	_____

b. Daily: Past 7 days      Typical      Past 7 days      Typical

Mon.	_____		Fri.	_____	_____
Tues.	_____		Sat.	_____	_____
Wed.	_____		Sun.	_____	_____
Thur.	_____				

c. Percent of Gross Sales from:

1. Frozen Dessert Items . . . . . \_\_\_\_\_  
     (a) Proportion dispensed from trucks ( \_\_\_\_\_ )
2. Beverages . . . . . \_\_\_\_\_
3. Nondairy Food Items . . . . . \_\_\_\_\_

d. Net Returns from Dairy Enterprise

- |                   |                 |                 |                                  |
|-------------------|-----------------|-----------------|----------------------------------|
| ( ) under \$1,000 | ( ) 3,000-4,000 | ( ) 6,000-7,000 | If above 9,000,<br>Nearest 1,000 |
| ( ) 1,000-2,000   | ( ) 4,000-5,000 | ( ) 7,000-8,000 |                                  |
| ( ) 2,000-3,000   | ( ) 5,000-6,000 | ( ) 8,000-9,000 |                                  |

VITA

FRANCIS RAEFORD BAKER

Candidate for the Degree of  
Master of Science

Thesis: THE SOFT-SERVE DAIRY PRODUCTS INDUSTRY IN OKLAHOMA: SALES,  
COSTS AND MARKETING PRACTICES

Major Field: Agricultural Economics

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