Marketing Practices in the Oklahoma Ice Cream Industry

J. Richard Crow

Leo V. Blakley

AGRICULTURAL EXPERIMENT STATION
OKLAHOMA STATE UNIVERSITY

Bulletin B-681

September 1970

CONTENTS

Marketing Practices in the Oklahoma Ice Cream Industry

J. Richard Crow and Leo V. Blakley*

The per capita consumption of frozen dairy products in the United States increased about 50 percent from 1950 to 1969. Though several types of products shared in the increase, the greatest increase occurred in the consumption of ice milk. Relatively large increases also occurred for sherbet and mellorine. The consumption of ice cream increased only slightly from about 17 pounds in 1950 to about 18½ pounds in 1968.

The total demand for frozen dairy products has not increased as fast in Oklahoma as in the United States primarily because the population of the state declined relative to the United States total. Total production in the state was 13.6 million gallons in 1967.

The relatively stable quantities demanded, the economic pressures for cost reductions from the new technology, and the different marketing practices have resulted in exits of some firms from the industry. In 1950, a total of 144 plants were listed as manufacturing 6.1 million gallons of ice cream in Oklahoma. The number of major wholesale and retail manufacturers was 73. By 1968, the number of plants had declined to 41. The number of major manufacturers was down to 26, only about one-third the number two decades ago.[1]

The volume of ice cream manufactured in 1967 was about the same as in 1950 (5.9 million gallons), but the volume of sherbet, ice milk and mix, and mellorine and mix processed by these plants was greater. As a result, the average size of plant increased somewhat more than indicated by reductions in the number of plants.

Objectives and Procedures

The major objective of the study was to obtain information on the current market structure, marketing practices, and major problems faced by firms in the frozen dessert industry. Hopefully, providing knowledge of current practices and problems will lead to more efficient distribution

*Graduate Assistant and Professor respectively, Department of Agricultural Economics.

[1]Volume and number data from *Production of Manufactured Dairy Products,* 1968, SRS,USDA Da2-1 (69), July 1969, p. 41 and previous issues. Some plant numbers data were obtained from *Oklahoma Dairy Manufacturing Plants,* 1969, published by the Oklahoma State Board of Agriculture, Oklahoma City, Oklahoma.

Research reported herein was conducted under Oklahoma Agricultural Experiment Station project number 1221.

of frozen desserts from the standpoint of both the firms, the industry, and the consumers.

A survey of Oklahoma Dairy Manufacturing Plants licensed to manufacture ice cream, ice milk, mellorine, and mixes was conducted during the summer of 1968. The managers of approximately 97 percent of the licensed firms were personally interviewed. Data from the interviews provide the basis for the analysis. The survey excluded the smaller firms classified as manufacturers of Frozen Dairy Desserts. These firms were the subject of an earlier study.[2]

Data on all aspects of the dairy manufacturing industry were not obtained from all firms. There were some refusals and some withholding of details. However, the survey results include detailed product data for two-thirds of the frozen dairy products produced in the state. Coverage was relatively complete for ice cream and mellorine. Less than 50 percent of the ice milk production was accounted for by the survey firms but much of the latter was produced by the soft-serve segment of the dairy industry.

Firms were defined as (1) small—processing less than 250,000 gallons per year, (2) medium—processing 250,000 to 1,000,000 gallons per year, and (3) large—processing 1,000,000 gallons or more per year. On this basis, small firms process about 5 percent of production, medium firms process about 20 percent, and large firms process about 70 percent of Oklahoma's production.

Procurement

Ice Cream Ingredients

Mix for manufacturing ice cream was made or processed in the plant by 21 firms. Only two firms purchased mix, and only one of these firms purchased mix from a firm outside the corporate structure of the Oklahoma plant.

The dairy product ingredients in the mix came from several sources. Of the firms responding, 71 percent used whole milk, primarily surplus Grade A milk. All the medium-sized firms and 75 percent of the large-sized firms used whole milk. Butter, butterfat, or standardized cream was used as the major source of fat in the mix by 25 percent of the large-sized firms and by 50 percent of the small-sized firms. One small firm used a butterfat-sugar mixture.

The costs associated with fulfilling the butterfat requirement for ice cream varied among firms. When whole milk was used exclusively or

[2]Leo V. Blakley and F. Raeford Baker, *Sales, Cost and Marketing Practices of Firms Selling Soft-Serve Dairy Products in Oklahoma,* Oklahoma Agricultural Experiment Station Processed Series P-565, May 1967.

with condensed milk, the reported costs ranged from 65 and 70 percent of the total cost. Slightly higher costs were reported for firms using standardized cream as the source of butterfat.

All the major dairy product ingredients used in the ice cream mix were purchased from Oklahoma firms. Volume discounts on ingredients were reported only for sugar and container cartons.

Ice Milk Ingredients

Mix for manufacturing ice milk was handled about the same as for ice cream. All except two plants processed their own mix, and the major source of dairy product ingredients was whole milk purchased in Oklahoma.

Mellorine Ingredients

All firms manufacturing mellorine processed their own mix, based on the survey results. The fat used was a vegetable fat and generally comprised about 20 percent of the cost of the mix. In contrast to the pricing structure for dairy products, discounts for volume purchases of vegetable fat were reported. Most of the purchases were from out-of-state firms.

Distribution

Out-of-State Sales

There were eight firms reporting the sale of ice cream in areas outside Oklahoma. This was about one-third of the firms surveyed, and the sales represented 9.1 percent of total sales. The percentage of sales was highest at 13.7 for the medium-sized firms and lowest at 3.6 for the small-sized firms.

Out-of-state sales of ice milk were reported by six firms, and the share of their sales was relatively small. The average was 7.0 percent with the percentages ranging from 2.1 for small, 3.3 for medium, and 7.6 for large-sized firms.

Mellorine sales outside Oklahoma were reported by only four firms, but the volume was relatively larger than for ice cream or ice milk. About 20 percent of the sales of mellorine were to firms located outside Oklahoma. The largest share of out-of-state sales, 37.8 percent, was reported for the medium-sized firms.

Few firms reported the sale of mix to out-of-state locations. The volume was small except possibly for novelties.

Market Areas in Oklahoma

Frozen dessert manufacturing firms tend to be located in areas with the greatest concentration of population. The market areas of these firms also reflect the potential demand for the product in population centers as well as the size of the manufacturing facility. The larger plants tended to cover wide geographical areas surrounding the major population centers. The smaller plants tended to have localized sales and to be located in larger numbers in the more populated areas.

The relative concentration of frozen dessert product distribution is illustrated in Figure 1. The central part of the State is included in the market areas for the largest number of firms in the survey. A total of 15 firms indicated that they had product distribution in Oklahoma County. The number of small firms decreased to zero at the extreme northwest and southeast locations, and the number of major distributors serving these areas also was small.

Major Outlets

Major changes have occurred during the past 30 years in the distribution patterns of frozen desserts. Technological and marketing innovations in such items as low temperature storage space in home refrigerators and freezers, improved packaging, and increased use of supermarkets have contributed to greater availability and use of frozen desserts.

Ice Cream — Drug stores formerly were the most important outlets for ice cream. In 1938, about 29 percent of the ice cream was distributed

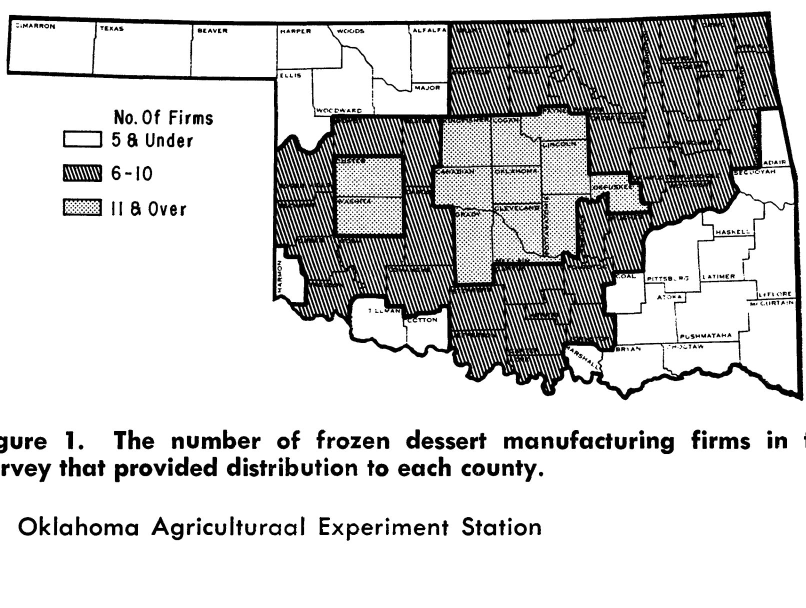

Figure 1. The number of frozen dessert manufacturing firms in the survey that provided distribution to each county.

through drug stores in the United States (Figure 2). Restaurants were next most important. Food stores accounted for only about 11 percent of the sales.

Food stores have become the most important outlet for ice cream. By 1968, about 58 percent of the ice cream was distributed through the food stores. The percentage moving through drug stores had declined to 3.6. Sales through restaurants remained in the second place but the percentage had declined to 12.4.

Comparable data were not available for Oklahoma for the earlier years. In 1968, the survey results were consistent with the national data in terms of ranking but the proportion of sales through food stores was relatively greater. The percentage was 82 for all grocery stores (chain and independent) and discount stores (Table 1).

Ice Milk — The distribution outlets for ice milk and ice cream were similar. About 85 percent of the ice milk was distributed through grocery and discount stores. Specialty stores, including drive-ins, and sales over the counter comprised about 8 percent of sales. Reported sales of ice milk through hotels and restaurants were very small.

Mellorine — The survey results indicated that mellorine was distributed almost exclusively through grocery and discount stores. For grocery stores the percentage was 85, somewhat larger than for either ice cream or ice milk. About 13 percent of the mellorine was distributed through dis-

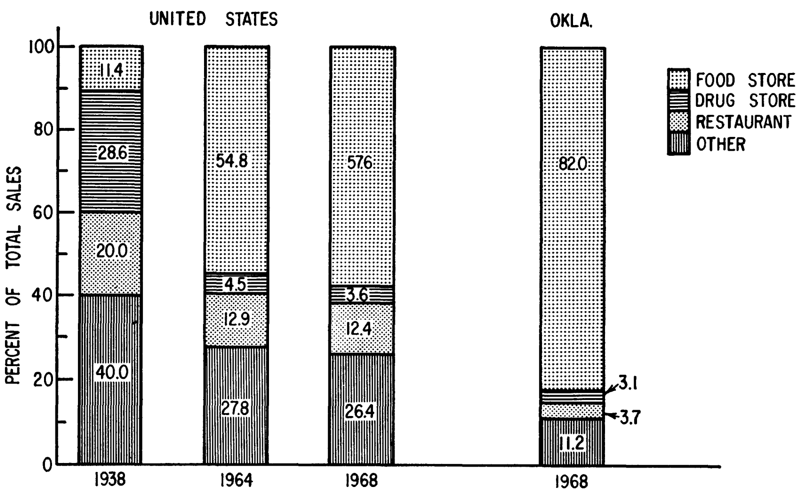

Figure 2. Distribution of frozen dessert through major sales outlets, United States and Oklahoma in selected years.
Source: 1968 U.S. data from *Dairy and Ice Cream Field,* April, 1969, p 30; 1938 and 1964 data from *Organization and Competition in the Dairy Industry,* Technical Study No. 3 of the *National Commission on Food Marketing,* June, 1966, p 250.

Table 1. Relative Importance of Specified Outlets in the Distribution of Ice Cream in Oklahoma, 1968.

	Small Firms	Large Firms	All Firms[1]
		— percent of sales —	
Food Stores			
(incl. Discount Stores)	52.6	88.5	82.0
Specialty Stores[2]	25.7	4.4	9.7
Drug Stores	4.2	3.1	3.1
Hotels & Restaurants	0.2	3.7	3.7
Other Outlets	17.3	0.3	1.5
Total	100.0	100.0	100.0

[1]Includes medium-size firms which were not tabulated separately for this table.
[2]Includes company-owned stores and sales to drive-ins.

count stores. The percentage for discount stores was significantly larger than for the other frozen desserts and tended to be larger for the medium-sized firms than for either the small-or large-sized firms.

Container Size

More of the larger sizes of containers are being used for sales of frozen desserts to consumers. In 1954, only about one-half the gallonage packed in the United States was in one-half gallon and gallon containers (Figure 3). By 1968, the percentage for these two sizes had increased to 85.1. The change reflects both the increased consumption and the change to consumer purchase of frozen desserts at the supermarket.

In Oklahoma, 83 percent of the production of frozen desserts (ice cream, ice milk, mellorine, etc.) in 1968 was packaged in one-half gallon containers and almost nine percent was in gallon containers. About six percent was in containers larger than one gallon, primarily ice cream in three gallon containers. Less than two percent was in the quart, pint, and half-pint container sizes.

The percentages for Oklahoma are weighted heavily toward packaging for food store sales. Food store sales of frozen desserts tended to be concentrated in the one-half gallon container size. Almost all the mellorine was in this size — the maximum size according to state law for this product. Packaging in the gallon container represented primarily ice cream.

Sales to hotels and restaurants in Oklahoma were in the 3-gallon container size. Sales to drug stores were divided between the 3-gallon tub (59 percent) and the one-half gallon package (41 percent). Presumably the larger size was used for in-store dispensing while the smaller size was for take-home sales.

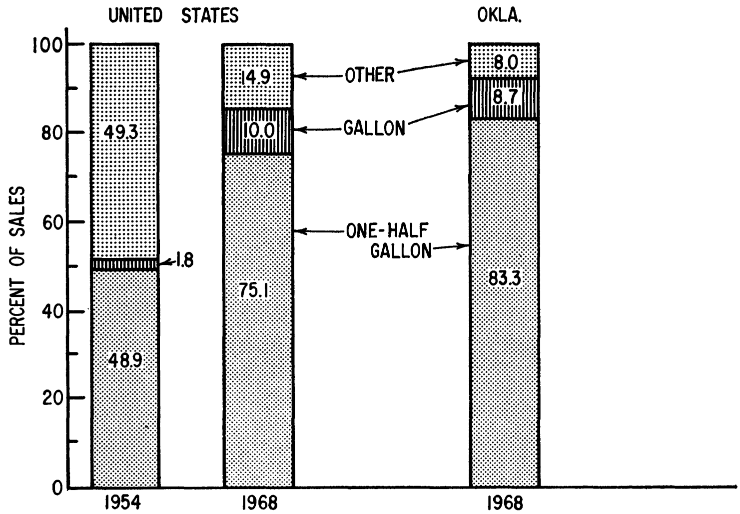

Figure 3. Distribution of frozen desserts by container size, United States and Oklahoma in selected years.
Source: 1968 U.S. data from *Dairy and Ice Cream Field,* April, 1969, p 35; 1954 data from *Organization and Competition in the Dairy Industry,* Technical Study No. 3 of the *National Commission on Food Marketing,* June, 1966, p 252.

Competitive Environment

Capacity

Most of the firm managers considered the capacity to manufacture frozen desserts in Oklahoma as adequate. The remainder was divided between those who thought that excess capacity existed and those who thought that additional capacity was needed.

Almost all the medium and large-sized firms had built additional capacity to manufacture frozen desserts after 1950. This was in direct contrast to the 70 percent of the small firms which had not added to capacity.

Views of Barriers to Entry

Barriers to entry cited by the firm managers centered on low returns and an unfavorable pricing situation in the industry. One third of the managers listed these two factors as barriers. Equipment cost, large volume requirements, and supermarket control of shelf space were other barriers cited by managers. Significantly, however, about one-third of the managers said that no barriers existed in the industry.

Expected Returns

Returns expected from the frozen dessert enterprise of the firm averaged 9.4 percent of investment for the firm managers answering the questions. One half of the responses were within the range of 8 to 11 percent. Managers with a profit goal higher than 11 percent slightly outnumbered the number with a profit goal under 8 percent.

Expectation of returns as a percent of the sales dollar averaged lower at 7.4 percent. Generally, only the small firms had a profit goal of more than 8 percent of the sales dollar and many of these firms performed the retailing function as well as the manufacturing function.

Price Leadership

One-fifth of the managers considered one firm as the leader in setting prices for frozen desserts in the market in which they operated. Generally this firm was not their own. Of the firms indicating price leadership in the area, the majority was in the small firm size classification.

Factors Influencing Prices

Cost was the item mentioned most frequently as the major factor considered in determining the price of ice cream. The percentage ranged from 56 for the small firms up to 75 or more for the medium- and large-sized firms.

Next in frequency of reporting was competition. One-third of the small firms listed competition as the most important factor influencing prices of frozen desserts. About one-half of the medium-sized firms listed competition along with another item such as cost as important factors. Other factors listed by the firm managers included profit, margins, wage rates, and time.

Implicitly, the excess capacity in the industry was a factor in determining product prices. During the peak activities of the summer months, operations were at 89 percent of capacity for the large firms, 73 percent for medium-sized firms, and 63 percent of capacity for the small firms. The percentages for the winter months were 59, 48, and 48, respectively, for the three sizes of firms.

Operations at low levels of capacity make it appear that increased volume would decrease per unit costs and increase profit. For example, if the cost schedules were similar to those shown in section A of figure 4, current operations might be at quantity q_1 with average cost of C_1. An increase in the quantity processed to q_2 would result in a reduction in unit costs to C_2.

Whether or not profits are greater with the increased volume will depend on the demand curve facing the firm. It might be visualized as D'' in Section B of Figure 4, in which case the reduction in price would be less than the reduction in costs and profits would increase.

A more likely case would be the demand curve D' in Section B which assumes that price concessions granted to increase volume will be match-

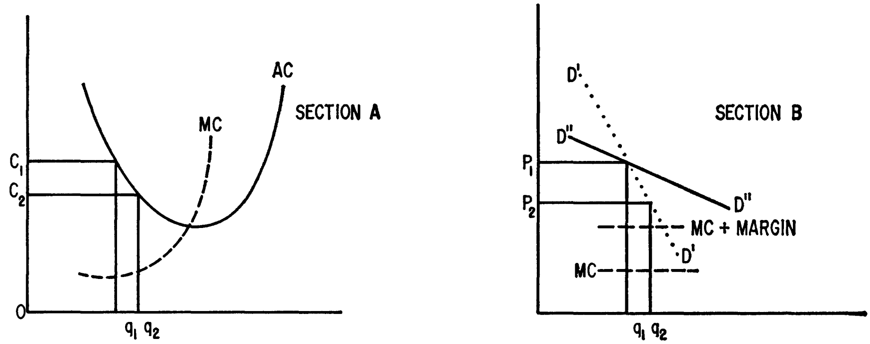

Figure 4. Hypothetical frozen dessert cost curves for manufacturing firms.

ed by competing firms. When quantity is increased from q_1 to q_2, costs go down from C_1 to C_2, but prices go down further from P_1 to P_2. The net result in this situation is a reduction in profit. Either consumers or the marketing firms (eg., grocery stores) benefit at the expense of the processor from the attempt to increase volume.

The same result could occur if the firms are assumed to follow the principle of marginal cost pricing. For example, assume that the firm is operating at volume q_1 and views marginal costs per unit as constant at MC in section B of Figure 4. The firm could price the product to new accounts at just over the marginal cost (MC plus margin), obtain a positive return on the amount sold to the new accounts, and have a lower average total unit cost on all production. As before, however, the net profit could decrease if the prices decreased more than costs decreased. It is possible in the short run to have prices for the product in new accounts decreased down to the level where only marginal costs are covered. As the volume of product sold in the new accounts increased relative to total sales, long run losses then would become greater and could cause the firm to exit from the industry.

Advertising

Advertising is one means of attempting to influence the quantity sold by changing either the position or the shape of the demand schedule. In 1956, advertising expense for frozen products as a percentage of sales varied from 0.3 to 1.6 for seven national firms.[3]

In the 1968 Oklahoma survey, most of the estimates ranged from 1.0 to 2.0 percent of sales. There appeared to be no relationship between

[3]Hugh L. Cook, *Consequences of Structural Changes in the Ice Cream Industry,* Wisconsin Agricultural Experiment Station, Research Bulletin 236, June 1962, p. 67.

the firm size and the level of advertising for the firms reporting any advertising. However, a relatively large number of small firms reported no advertising expense.

Television was the most important advertising medium. Although used exclusively by the medium and large-sized firms, it represented about one-third of advertising expenditures. Newspaper advertising expenditures were next in importance at about 31 percent of the total. Point-of-sale advertising represented about one-sixth of total expenditures. Close behind in importance was radio advertising.

Private Labels

Ice cream ranked fifth among the 20 largest selling private label products of food chains in the United States in 1965.[4] The ranking was higher than for any other dairy product. About 63 percent of the chains in the U.S. and 80 percent in the Midwest carried a private label ice cream.

The managers of about 78 percent of the Oklahoma ice cream manufacturing firms reported either the production of private label products or the fact that their products faced competition from private label products in the retail outlets. Firms not reporting such competition tended to be small firms.

Frozen desserts were produced under private label by one-third of the firms. The proportion was greater for the medium-sized firms (over one-half) than for the large firms (under one-half). No production under private label was reported for the small firms.

Firm managers indicated several reasons for entry into the production of private label products. The reason listed most frequently by the medium-sized firms was to increase the firm's share of the market for frozen desserts. Maintaining the current market share for the firm and ensuring an allocation of shelf space in the food store were the two next important reasons given by one-half the medium-sized firm managers. Reasons grven for the large firms included: (1) gaining a new market, (2) increasing the market share for the firm, and (3) ensuring shelf space for the firm's product in the food store.

Most of the firms not engaged in manufacture for private labels produced more than one quality of frozen desert. The exception was the small sized firms which produced only one quality. Several reasons were given for ranking the quality of their first-line product above either the private label or the secondary label product. Most of the reasons could be classified under the headings of higher quality, wider flavor selection, lower overrun, higher butterfat content, and the values of an advertised brand name.

[4]National Commission on Food Marketing, *Organization and Competition in the Dairy Industry*, Technical Study No. 3, June 1966, pp 136 and 241.

Views of Unfair Competitive Practices

Unfair trade practices often had been reported in the Oklahoma dairy industry. In the 1955 Oklahoma law, the following intent was expressed:

> **Section 419.1 Legislative intent:** The practices being conducted by many dairy processing, wholesaling and distributing plants in Oklahoma, in the subsidization of retail dealers, through secret discounts, sales below cost or at unreasonably low costs, and the furnishing of equipment, are forcing numerous dairy plants out of business, and are practices which adversely affect the stable economy of Oklahoma. Such practices tend to reduce the price paid to the dairy producer, increase the price paid by the consumer, lessen competition, restrain trade and create a monopoly, is unfair competition, contrary to the public welfare and contrary to public policy.[5]

A summary of the marketing regulations in Oklahoma from the Dairy Practice Law of 1955 (Senate Bill 305) is as follows:[6]

Refrigeration Facilities	Unlawful to furnish, give, rent, lease or lend ice cream cabinets. May sell ice cream cabinets at not less than manufacturer's list price plus a 5 per cent markup after deducting depreciation on the basis of 15 percent annually to a maximum of 90 percent. Terms may be cash or a conditional contract payable in 30 monthly installments at 6 percent interest.
Other Equipment, Fixtures, Stores, Etc.	May not furnish, give, rent, lease, or lend equipment, fixtures or supplies, except ice cream cabinets and expendable supplies commonly provided in connection with sales of dairy products. May sell fixtures and equipment on same terms as for refrigeration equipment.
Servicing Facilities or Equipment	The mechanical or electrical servicing of equipment is the responsibility of the retail dealer, but may be furnished by the wholesaler, processor or distributor for a reasonable charge.
Advertising	May furnish normal point-of-purchase advertising matter to retail dealers, but no outside advertising matter shall advertise other than the dealers' own dairy products, except 1/3 of

[5]Oklahoma State Department of Agriculture, *Dairy Laws Administered by Dairy Division,* 1966, p. 31.
[6]International Association of Ice Cream Manufacturers, *Digest of State Laws,* Washington, 1962.

	the space may be allocated to the retail dealer on whose premises the same is placed.
Loans & Credit	Unlawful to guarantee any loan or to extend credit beyond commonly prevailing normal periods of payment. Unlawful to offer or give any bonus, premium or compensation to a retail dealer.
Gifts	May give nothing of substantial value, nor any bonus, premium or compensation to a retail dealer.
Discounts & Rebates	May not grant to any retail dealer secret discounts or rebates.
Price Discrimination	May not permit any deviation from price of dairy products of the same quality, brand and quantity in the same locality.
Tie-In Combination, Coupon Sales, Ect.	Combination sales may not be for less than combined cost of all items.
Sales Below Cost	May not sell any dairy product unit, or combination thereof to wholesalers or retailers for less than cost.

Competitive practices were reported for the nation in 1958 which would be illegal in Oklahoma. Yes responses were indicated for the following services or equipment provided without charge: 79 percent for ice cream cabinets; 69 percent for exterior sign work; 62 percent for financing equipment, and 28 percent for interest-free loans.[7]

Managers of the Oklahoma firms were asked if they felt that any of the unfair trade practices were used by other firms with which they competed. The answers were in the affirmative. The unfair practices reported in this section *may* or *may not* exist. What is important to the market structure is that the firm managers believe that such practices are being used. Based on these beliefs, the firms can get involved in price and non-price competitive practices which result in losses to most firms in the industry.

The practice mentioned most frequently, by four out of five firm managers, was selling at prices below the quoted prices (Table 2). The practice was reported uniformly by small-, medium-, and large-sized firms.

Two other practices were related to product pricing. The managers of about two-thirds of the firms felt that other firms gave volume discounts regardless of volume sold or had "needless" price specials which led to price wars. The percentages of managers expressing these views

[7]National Commission on Food Marketing, *Organization and Competition in the Dairy Industry*, Technical Study No. 3, June 1966, p. 237.

Table 2. Competitive Practices Allegedly Used by Competitors in the Market for Frozen Desserts in Oklahoma, 1968

	Percent of firms reporting the practices being used by other firms
Selling at prices below quoted prices	79
Using needless price specials which lead to price wars	67
Using volume discounts regardless of volume sold	71
Using tie-in arrangements	58
Furnishing cabinets at no (or less than) cost	58
Furnishing signs at no (or less than) cost	62
Furnishing credit at no (or less than market rates of) interest	54
Furnishing extra services at no cost	33

were significantly larger for the medium- and large-sized firms. Only about one-half of the small-sized firms felt that these practices were used by competitors.

About one-half the firm managers felt that tie-in arrangements were being used by competitors. A larger percentage of the medium-sized firms (83 percent) listed this practice than the other firm sizes.

Four practices were related to costs. Slightly over one-half the firm managers felt that cabinets, signs, and credit were being furnished to retailers at no cost or at less than full cost. The largest frequencies of the reported beliefs included 83 percent of medium-sized firms reporting the furnishing of cabinets, 70 percent of the small-sized firms reporting the furnishing of signs, and 67 percent of the medium-sized firms reporting the furnishing of credit.

Only one-third of the firm managers felt that extra services were furnished at no cost when costs should have been charged to retailers. The fact that over one-half the medium sized firms but only a few of the large firms reported the practice indicates that there could be substantial differences of opinion concerning the definition of "free" services which should be charged to retailers.

Summary

Frozen dessert production in Oklahoma totaled 13.6 million gallons in 1967. Firms producing 1,000,000 gallons or more per year represented about one-third of firm numbers and processed 70 percent of the volume. Small firms, with less than 250,000 gallons of production per year, processed about five percent of production.

Mix for manufacturing frozen desserts was made or processed in the plant by most firms. The dairy product ingredients came mostly from surplus Grade A milk and were purchased from Oklahoma firms. Only one firm reported the use of a butterfat-sugar mixture.

Frozen desserts were produced primarily for the Oklahoma market. Out-of-state sales represented less than 10 percent of ice cream and ice milk sales but about 20 percent of mellorine sales. The latter tended to be concentrated in sales by the medium sized firms.

Food stores have become the most important outlet for ice cream. The percentage of sales through this outlet was 82 for Oklahoma as compared with 58 for the nation. Excluding sales through soft-serve types of outlets, the percentage for Oklahoma was slightly higher for ice milk and mellorine than for ice cream. Most sales through food stores were in the one-half gallon carton. Sales to restaurants and hotels were in the three-gallon size of container.

The firm managers characterized the economic environments as competitive. About one-third cited low returns and an unfavorable pricing situation as barriers to entry, one-third cited other factors, and one-third said no barriers existed.

One firm was considered as the leader in setting prices of frozen desserts by about 20 percent of the managers. Generally, these views were held by managers of small firms.

Cost was the item mentioned most frequently as the major factor in determining the price of ice cream. The percentage listing cost ranged from an average of 56 for the small firms up to 75 or more for the medium-sized and large firms. Competition was next in order of importance. The importance of these two factors to the managers reflects the influence of excess capacity in the industry on pricing practices.

In order to expand the volume of production, firms have been willing to lower prices or enter the private label market. Some prices appear to reflect only the marginal costs of production. The net result of this type of pricing practice is long-run losses and pressures for some firms to leave the industry. A similar environment can result from the manufacture for private labels. One-third of the firms produced frozen desserts for the private label market. The proportion was higher for the larger firms. Reasons given for entry included (1) gaining a new market, (2) increasing the market share for the firm, and (3) ensuring shelf space for the firm's product in the food store.

Managers of Oklahoma firms felt that unfair or illegal trade practices were used by some of their competitors. Selling at prices below the quoted prices was suspected most often. Volume discounts given for any volume and "needless" price specials were listed by more than one-half the firms. Other practices listed included tie-in arrangements and the furnishing of equipment, signs, credit or extra services at no cost or at less than full cost.

0970/2M