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COTTAGE CHEESE AND FROZEN DESSERTS

**Cost of Production in Diversified
Milk Plants in Kansas,
Missouri
and
Oklahoma**

PREFACE

This report presents data on costs of making cottage cheese and frozen desserts in diversified milk processing plants in Kansas, Missouri, and Oklahoma. It is the second of two reports on the production and marketing of these products; also it is one of several studies dealing with the pricing of surplus graded milk in these States.

Cottage cheese and to a lesser extent frozen desserts are integral parts of most fluid milk operations. Together, these products constitute the main outlet for surplus milk, therefore, the costs of making them and the returns from their sales have a direct bearing on the pricing of such milk.

Six related Marketing Research Reports have preceded this one: The Marketing and Pricing Structure for Bulk Sweet Cream in Kansas, Missouri, and Oklahoma Markets, Marketing Research Report (MRR-74); Prices and Other Payments for Milk by Manufacturers in Kansas, Missouri, and Oklahoma Markets (MRR-81); The Marketing and Pricing Structure for Skim Milk Products in Kansas, Missouri, and Oklahoma Markets (MRR-166); The Market for Class II Milk in Oklahoma, Kansas, and Western Missouri (MRR-263); Butter and Nonfat Dry Milk Production in Diversified Plants in Kansas, Missouri, and Oklahoma (MRR-430); and The Marketing of Cottage Cheese and Frozen Dairy Products in Kansas, Missouri, and Oklahoma (MRR-504). In the final report, the findings on the separate aspects of all the previous studies will be brought into proper relationship with one another and with the major objective of improving the methods of pricing surplus milk in the fluid markets of this area.

A related study of marketing surplus milk in the Wichita, Kansas, and Southwest Kansas markets is being conducted under the direction of Paul L. Kelly of Kansas State University. Three parts of the 4-part study have been published, and the final one is in process. This study is part of the North Central regional project dealing with marketing surplus milk.

Thanks are due to the plant managers and other personnel who contributed time and effort to furnish the data included in this report.

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Washington, D. C.

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SUMMARY

The average cost for processing and marketing cottage cheese was 19.7 cents per pound in 7 South Central fluid milk plants; and for 5 of these plants, total cost for processing and marketing frozen desserts -- ice cream, ice milk, and related products -- was \$1.15 per gallon. Costs varied considerably among the plants -- both for cottage cheese and frozen desserts -- by as much as 11.9 cents per pound for cottage cheese and 49 cents per gallon for frozen desserts. Most of the variation was due to differences in costs for ingredients and selling and delivering.

Processing was the highest cost for cottage cheese. It accounted for over two-fifths of total costs. The next highest cost, slightly over one-third, was for ingredients. The remaining costs in order of importance were (1) selling and delivering, (2) administration, and (3) finished products -- dry curd and creamed cottage cheese -- purchased for resale.

Ingredients constituted the highest cost for frozen desserts -- over two-fifths of the total. Processing cost was next highest, a fourth, and the remaining, in the order of importance, were (1) selling and delivering, (2) finished products -- usually novelties -- purchased for resale, and (3) administration.

The average net selling price for cottage cheese was 23.4 cents per pound and for frozen desserts, \$1.19 per gallon. Selling prices for both products varied considerably among plants -- as much as 10.7 cents per pound for cottage cheese and 38.1 cents for frozen desserts.

Net returns received for cottage cheese averaged 3.7 cents per pound, for frozen desserts, 4.2 cents per gallon. All plants except one received a net return on cottage cheese, and all except one received a net return on frozen desserts.

About 35 percent of all surplus graded milk and ungraded milk was used in cottage cheese and frozen desserts -- cottage cheese, 23.7 percent, frozen desserts, 11.4 percent. Five of the 7 plants used no ungraded milk in these products. These 5 plants used 48.6 percent of their surplus graded milk in cottage cheese and frozen desserts -- 36.8 percent for cottage cheese and 14.6 percent for frozen desserts.

Frozen desserts constituted a greater part of total plant sales than did cottage cheese. Combined sales of these products accounted for 15.1 percent to total sales -- 4.0 percent for cottage cheese and 11.1 percent for frozen desserts.

COTTAGE CHEESE AND FROZEN DESSERTS: COST OF PRODUCTION IN DIVERSIFIED MILK PLANTS IN KANSAS, MISSOURI, AND OKLAHOMA

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INTRODUCTION

Minimum prices paid to producers of graded milk (milk eligible for fluid consumption) by distributors in the South Central area milkshed are controlled by four Federal milk marketing orders: Greater Kansas City, Wichita, Neosho Valley, and Oklahoma Metropolitan. The South Central milkshed comprises the greater part of Kansas and Oklahoma, about half of Missouri, and smaller adjacent areas of Arkansas and Iowa; recently some supplies have entered the milkshed from Minnesota (fig. 1).

Three of the four Federal milk marketing orders in the South Central area use a 2-class system for pricing milk. Graded milk sold to consumers in fluid form is classified as Class I. That part of the graded milk supply made into nonfluid items -- butter, cottage cheese, ice cream, etc. -- is classified as Class II (surplus). Wichita, with a 3-class system, puts all milk used in manufactured products except cottage cheese in Class III. Milk used in cottage cheese falls in Class II. This milk is priced higher than Class III.

Purpose of Study

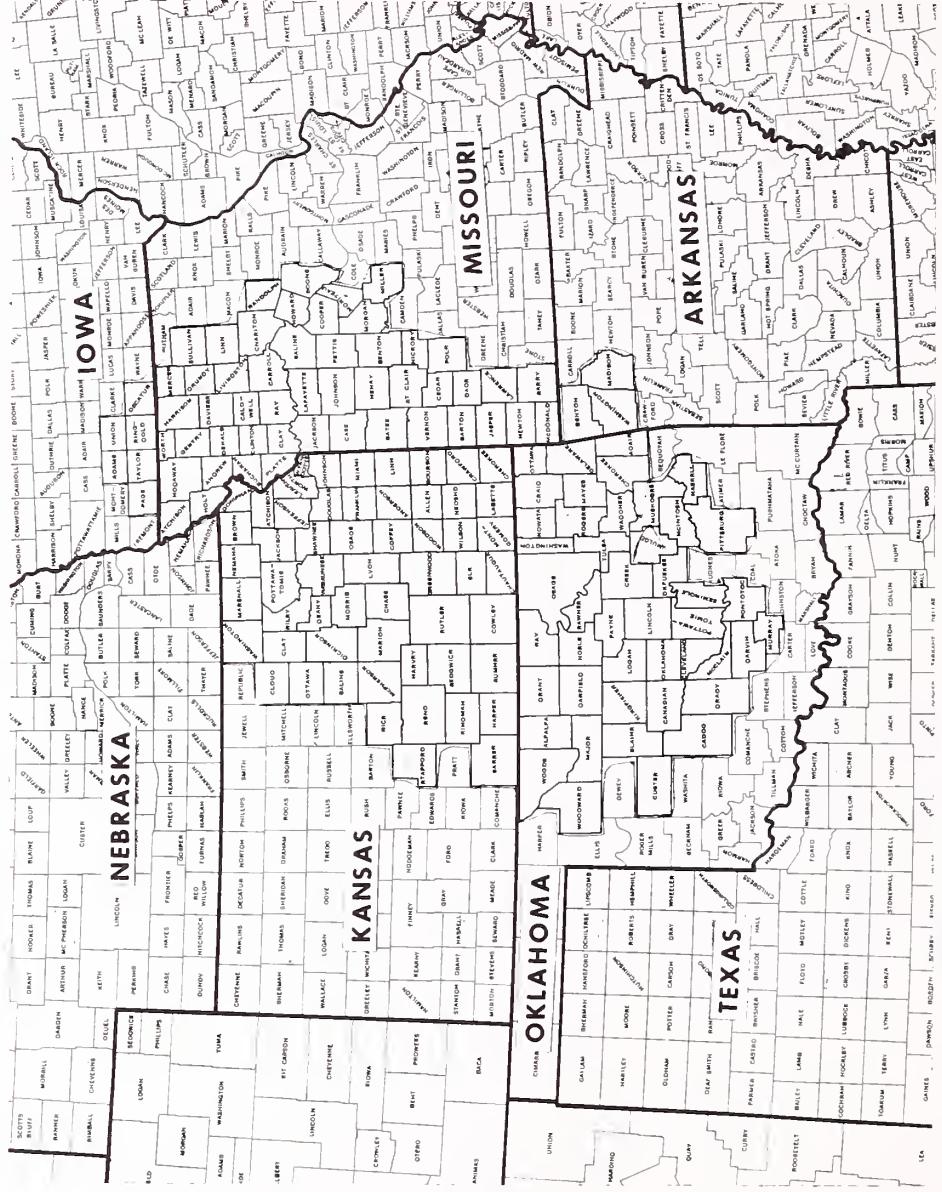
This report, as were related studies, is intended to provide criteria for an improved basis of pricing surplus graded milk. The specific aim is to ascertain costs of processing and marketing cottage cheese and frozen desserts -- ice cream, ice milk, and related products -- in Federally regulated fluid milk plants. Such information serves at least three other purposes: (1) The data furnish bases from which net returns can be determined; plant managers in the South Central area will be able to appraise the profitability of these products in their own operations. (2) The data show the relation of ingredient costs, particularly surplus milk, to total product cost. (3) The data indicate variations in costs among plants.

Scope of Analyses

Detailed information about the cottage cheese and frozen desserts operations for seven fluid milk processing plants was obtained from accounting records, by observation, and by interview. Data were collected for the most recent fiscal year and included milk receipts and utilization; milk and nonmilk ingredient costs; processing costs; selling and delivering costs; general administration costs; net dollar sales; and other pertinent information.

GENERAL MILK SUPPLY AREA

For 4 Federal Order Markets, South Central U. S., 1961*



*IN ADDITION ONE MARKET RECEIVED MILK FROM THE FOLLOWING: CEFRO GARDO, KOSSEUTH, OSCEOLA, AND SAC COUNTIES IN IOWA; AND MURRAY, NOBLES,
DICKSON, AND ROCK COUNTIES IN MINNESOTA.

U. S. DEPARTMENT OF AGRICULTURE

NEG. ERS 1999-63 (5) ECONOMIC RESEARCH SERVICE

Figure 1

Cost data in this report are based on actual plant costs. No attempt is made to isolate and eliminate cost differences among plants resulting from variations in prices paid for inputs, scale of plant operations, degree of efficiency, varying use of fully depreciated equipment, or differences due to plant location. In making short-range decisions, plant management is generally influenced by actual, current operating costs; long-range decisions may be influenced by both current and anticipated changes in costs.

The seven plants included in the study were fairly well representative of industry in the area, though not necessarily typical of all plants that manufacture cottage cheese and frozen desserts. At least one plant was studied in each of the four Federal order marketing areas.

GENERAL NATURE OF THE PLANTS' OPERATIONS

All plants in this study received graded milk from producers. Three plants also received substantial quantities of ungraded milk; two of these received farm-separated cream. The plants received more graded milk -- about 28 percent -- than could be sold as fluid milk. This milk was used in cottage cheese, frozen desserts, butter, nonfat dry milk, condensed milk, and other manufactured products. Each plant differed somewhat as to the kind and amount of manufactured products made.

All of the plants made cottage cheese, but only five made frozen desserts. The two plants that did not make frozen desserts obtained the product from other plants. Plants that did manufacture frozen desserts sometimes bought the product either on a regular basis or in periods of shortages. The product purchased on a regular basis usually consisted of novelties. Some plants bought all of their novelties, others only part.

Ice cream, ice milk, mellorine, and other frozen dessert mixes manufactured totaled 1,827,247 gallons (table 1). In addition, 4,385 gallons of mix were purchased from other processors. About 70 percent of all mixes were used in the same plant to make finished frozen desserts. The remaining mix -- mostly ice milk -- was sold to other firms.

Table 1.--Frozen dessert mixes: Production by type of mix for 5 South Central fluid milk plants, 1960-61

Type of mix	Butterfat content	Production	
		Percent	Gallons
Ice cream-regular.....	10-11	664,887	36.4
Ice cream-premium.....	14-16	17,931	1.0
Ice milk.....	3-4	142,890	7.8
Ice milk.....	5-6	751,894	41.1
Sherbet.....	1-3	33,014	1.8
Other 1/.....	varied	216,631	11.9
Total.....	---	1,827,247	100.0

1/ Mellorine, malt-a-plenty, fudgsicle, popsicle, etc.

Ice milk mix constituted almost half of all mixes produced. Ice cream mix was next in importance at about two-fifths. Sherbet mix accounted for about 2 percent. Among other mixes made were fudgsicle, popsicle, mellorine, malt-a-plenty, and dietetic ice cream.

Both mix production and mix sales were largely seasonal (table 2). About 55 percent of all mix was made between May and September, and about 60 percent of the total annual mix produced was sold during these months. Average monthly production was 72 percent higher during May-September and sales were 113 percent higher.

Total production of finished frozen desserts in the 5 plants was 2.4 million gallons for the year (table 3). Production in 2 plants fell within the range of 0.1 million gallons to 0.5 million gallons; production in the other 3 was between 0.5 and 1.0 million gallons. Production averaged about 0.5 million gallons for all plants.

Table 2.--Frozen dessert mixes: Monthly and annual production and sales,
5 South Central plants, 1960-61

Month	Mix production		Mix sold	Percent of production
	Gallons	Gallons		
January.....	99,652	22,218		22.3
February.....	88,313	22,417		25.4
March.....	124,624	26,743		21.5
April.....	161,538	47,949		29.7
May.....	181,745	60,478		33.3
June.....	218,147	69,066		31.7
July.....	221,994	70,912		31.9
August.....	215,756	73,093		33.9
September.....	168,522	55,288		32.8
October.....	140,801	43,856		31.1
November.....	105,932	29,240		27.6
December.....	100,223	23,459		23.4
Total.....	1,827,247	544,719		29.8

Table 3.--Cottage cheese and frozen desserts: Monthly and annual production, 1960-61

Month	Cottage cheese (7 plants)		Frozen desserts (5 plants)	
	Pounds	Percent	Gallons	Percent
January.....	604,029	8.0	133,108	5.7
February.....	646,748	8.5	121,211	5.1
March.....	686,637	9.0	187,866	8.0
April.....	687,302	9.0	209,534	8.9
May.....	655,941	8.6	222,961	9.5
June.....	678,172	8.9	263,587	11.2
July.....	646,312	8.5	268,339	11.4
August.....	651,945	8.6	265,067	11.3
September.....	658,796	8.7	219,835	9.3
October.....	588,536	7.8	176,674	7.5
November.....	541,300	7.1	145,837	6.2
December.....	557,316	7.3	138,254	5.9
Total.....	7,603,034	100.0	2,352,273	100.0

Cottage cheese production for the year totaled 7.6 million pounds for all plants (table 3). Production was between 0.5 to 1.0 million pounds for 2 plants and between 1.0 to 1.5 million pounds for 5 plants, averaging about 1.1 million pounds for all.

ECONOMIC IMPORTANCE OF COTTAGE CHEESE AND FROZEN DESSERTS AS A PART OF THE PLANTS' OPERATIONS

Cottage cheese and frozen desserts have economic importance in the operation of fluid milk plants because they provide outlets for surplus milk and supply part of their sales. Practically all fluid milk plants in the South Central area either make cottage cheese or buy it for resale; also, most plants either make frozen desserts or buy them for resale. ^{1/} Two plants reported in this study did not make frozen desserts but bought them for resale from other plants.

Outlet for Surplus Graded Milk

The 7 plants received 365.4 million pounds of graded producer milk for the 12-month period. About 28 percent or 103.5 million pounds of this milk was in excess of fluid milk sales, and it was used in nonfluid milk products. In addition to graded milk, 3 plants received 100.2 million pounds of ungraded milk and 5 plants received small quantities of milk, cream, and skim milk from other plants.

The proportion of graded milk going to surplus uses was much higher in the 3 plants which also received ungraded milk. About 39 percent of the graded milk in these plants was used in manufactured products; this compared with 22 percent for the other 4 plants. Plants that used greater quantities of graded milk in manufactured products did so because their manufacturing operations were considerably larger than those of the other plants. The 3 plants originally were manufacturing plants and had converted part of their operations to fluid milk. Producer conversion from ungraded to graded milk probably proceeded faster than the plants could market their fluid milk; hence, a large proportion of graded milk was diverted to manufactured products. In addition, the plants handled part of the reserve supply of graded milk for their markets.

Five plants used only graded milk in making cottage cheese and frozen desserts (table 4). These products served as an outlet for 51.4 percent of the total surplus graded milk in these plants -- 36.8 percent in cottage cheese and 14.6 percent in frozen desserts.

The proportion of the surplus milk supply used in frozen desserts varied more seasonally than did that used in cottage cheese. The proportion of surplus milk used in frozen desserts was highest during the summer and early fall months, but for cottage cheese the proportion was highest in February, September, and November (table 4). Cottage cheese appears to have a greater demand than frozen desserts on the total graded milk supply during the months when supply is lowest. Frozen desserts, being largely a warm weather seller, serve as an outlet for graded milk during the season of greatest supply.

Over a third of all surplus graded milk and ungraded milk for the seven plants was used in cottage cheese and frozen desserts (table 5). The ratio of usage was about 2:1 -- for every 100 pounds of milk used in cottage cheese 50 pounds was used in frozen desserts.

^{1/} Jones, W. Webster. The Marketing of Cottage Cheese and Frozen Dairy Products in Kansas, Missouri, and Oklahoma. U.S. Dept. Agr., Mktg. Res. Rpt. 504, Oct. 1961, p. 11.

Table 4.--Surplus graded milk: Utilization in cottage cheese and frozen dessert mixes by 5 South Central fluid milk plants using no ungraded milk, 1960-61

Month	Total surplus	Utilization 1/					
		Cottage cheese	Frozen desserts	Other			
	1,000 lbs.	1,000 lbs.	Pct.	1,000 lbs.	Pct.	1,000 lbs.	Pct.
January.....	5,256	2,007	38.2	554	10.5	2,695	51.3
February.....	5,092	2,224	43.7	512	10.0	2,356	46.3
March.....	6,037	2,257	37.4	709	11.7	3,071	50.9
April.....	6,404	2,345	36.6	809	12.6	3,250	50.8
May.....	7,352	2,208	30.0	1,010	13.8	4,134	56.2
June.....	6,471	2,208	34.1	1,176	18.2	3,087	47.7
July.....	6,506	2,253	34.6	1,227	18.9	3,026	46.5
August.....	6,395	2,211	34.6	1,135	17.7	3,049	47.7
September....	4,906	2,116	43.1	903	18.4	1,887	38.5
October.....	5,184	1,906	36.8	848	16.3	2,430	46.9
November....	4,327	1,741	40.2	632	14.6	1,954	45.2
December....	4,654	1,750	37.6	512	11.0	2,392	51.4
Total.....	68,584	25,226	36.8	10,027	14.6	33,331	48.6

1/ Includes any graded milk used in nonfat dry milk and any other manufactured product used in cottage cheese and frozen desserts. This is true only for those products which were made in the same plant making the cottage cheese or frozen desserts. Purchased ingredients are not included.

Table 5.--Surplus graded milk and ungraded milk: Percentages used in cottage cheese and frozen dessert mixes, by plant for 7 South Central fluid milk plants, 1960-61 1/

Product	Plants							Average
	A	B	C	D	E	F	G	
	-----	Percent	-----	-----	-----	-----	-----	
Cottage cheese	24.1	11.2	34.5	19.3	20.9	47.4	91.8	23.7
Frozen desserts	37.1	7.3	18.6	13.5	4.3	--	--	11.4
Total.....	61.2	18.5	53.1	32.8	25.2	47.4	91.8	35.1

1/ Includes milk used in nonfat dry milk, condensed milk, and any other manufactured dairy product used in cottage cheese and frozen dessert. This is true only for those products which were made in the same plant making the cottage cheese or frozen desserts. Purchased ingredients are not included.

Sales

Total sales of all products by the 7 plants for the 12-month period were \$39.8 million -- an average of about \$5.7 million per plant. Gross sales varied considerably

among plants. Sales by the smallest plant were less than a sixth of the average; sales by the largest plant were nine-tenths higher than the average.

Sales of cottage cheese and frozen desserts totaled \$4.6 million -- \$1.7 million for cottage cheese (7 plants) and \$2.9 million for frozen desserts (5 plants). Frozen desserts constituted a greater part of total sales than did cottage cheese in each of the 5 plants making both products (table 6). For the 5 plants (Plants A-E) these products accounted for 15.1 percent of total sales -- 4.0 percent for cottage cheese and 11.1 percent for frozen desserts.

Table 6.--Cottage cheese and frozen desserts. Percentage that each was of total dollar sales, by plant for 7 South Central fluid milk plants, 1960-61

Product	Plants							Average
	A	B	C	D	E	F	G	
Percent								
Cottage cheese	3.48	3.00	3.80	4.11	16.37	3.01	11.58	<u>1/</u> 4.24
Frozen desserts	14.50	9.07	13.99	7.07	18.05	--	--	<u>2/</u> 11.09
Total.....	17.98	12.07	17.79	11.18	34.42	3.01	11.58	<u>2/</u> 15.11

1/ Plants A through G.

2/ Plants A through E.

The relative importance of cottage cheese and frozen desserts as a part of total plant sales varied among plants. Plant E's returns from these products constituted about a third of its total sales. This is considerably higher than for Plant D in which they were only a tenth of total sales.

Dollars received from sales of mixes for 5 plants amounted to about 0.5 million -- 1.9 percent of total sales. Mix sales are not included in frozen desserts sales in table 6.

COSTS OF PRODUCING AND SELLING COTTAGE CHEESE AND FROZEN DESSERTS

Costs charged to cottage cheese and frozen desserts include all costs directly or indirectly involved in obtaining ingredients, manufacturing the products, and distributing the finished products to buyers. Specialized costs -- ingredients, labor, and equipment -- were charged directly to product. Indirect or joint costs, i. e., costs common to the production of more than one product, were allocated to product using various arbitrary methods. The method used to allocate any particular cost was that deemed most appropriate (see appendix).

Cottage Cheese

Costs for producing and marketing a pound of cottage cheese averaged 19.7 cents for all plants in 1960-61 (table 7). Total cost includes 6.8 cents for ingredients, 8.0 cents for processing, 3.9 cents for selling and delivery, 1.0 cent for administration, and 0.04 cent for cottage cheese purchased for resale.

Ingredients.--Two kinds of ingredients were used to make cottage cheese -- milk and nonmilk. Milk ingredients included skim milk, cream, and nonfat dry milk. Nonmilk ingredients were culture, salt, ascorbic acid, chives, fruit, etc.

Skim milk and cream made up about 90 percent of total ingredient cost for all plants (table 7). Nonfat dry milk was slightly over 8 percent and nonmilk ingredients, 1.5 percent.

Ingredient costs for cottage cheese varied considerably among plants. Plant C had the highest ingredient cost, 10.7 cents per pound. Plant C's cost was 97 percent higher than Plant G which had the lowest cost -- 5.4 cents per pound. This difference in cost was due largely to Plant C's higher cost for skim milk. Other factors than the price paid for individual ingredients caused differences in cost per pound among plants. Two of these were: (1) Difference in yield of cottage cheese per hundred-weight of raw ingredients, and (2) difference in the proportion of individual ingredients used.

Processing.--Containers and labor accounted for the highest and second to highest costs in the cottage cheese processing operation (table 7), almost 78 percent of the total. Container cost was 74 percent higher than that of labor. Utilities, overhead, and miscellaneous costs make up the remainder.

Processing cost per pound of cottage cheese varied less among plants than ingredient costs. This was probably due to smaller differences among plants in the cost of individual inputs -- labor, containers, etc. -- in processing. Processing costs were lowest for Plant A -- about 19 percent below the average for all plants and 33 percent below Plant F, which had the highest cost. Most of the difference between Plant A and Plant F was in cost of containers. Average container costs among plants varied for many reasons: Difference in price paid for containers of comparable size; differences in size of containers used; differences in proportions of each size used; and losses in plant operations.

Selling and delivering. -- Route labor and truck and truck supplies were the two most important constituents of selling and delivering costs for cottage cheese (table 7). Route labor was 51 percent and truck and truck supplies 28 percent of total costs of selling and delivering.

Selling and delivering costs varied considerably among plants. Costs per pound of cottage cheese sold ranged from a low of 1.6 cents for Plant G to 6.3 cents for Plant C. In other words, Plant C's cost was 286 percent higher than plant G's. Most of the variation in cost among plants was due to difference in labor costs.

Administration. -- Administration cost per pound of cottage cheese was 1.0 cent -- about 5 percent to total cost (table 7). As breakdown of total administrative cost was not available from some plants, only average total cost figures are given.

Average cost per pound varied considerably among plants. Cost ranged from a low of about 0.4 cents for Plant G to about 2.3 cents for Plant F -- a difference of 549 percent.

Table 7.--Cottage cheese: Cost of producing and selling, by plant for
7 South Central fluid milk plants, 1960-61

Type of cost	Plants							All plants	
	A	B	C	D	E	F	G		
Dollars per pound									
Ingredients:									
Butterfat.....	.0311	.0212	.0301	.0341	.0384	.0288	.0263	.0294	
Skim milk.....	.0185	.0309	.0758	.0230	.0424	.0207	.0233	.0298	
Procurement....	.0006	.0022	.0011	.0022	.0028	.0030	.0028	.0022	
Subtotal.....	.0502	.0543	.1070	.0593	.0836	.0525	.0524	.0614	
Nonfat dry milk	.0060	.0044	--	--	.0035	.0209	.0016	.0055	
Non-milk ingre- dients.....	.0006	.0014	.0004	.0004	.0007	.0031	.0004	.0010	
Total.....	.0568	.0601	.1074	.0597	.0878	.0765	.0544	.0679	
Processing:									
Labor.....	.0156	.0372	.0213	.0204	.0236	.0220	.0196	.0228	
Container.....	.0314	.0261	.0505	.0406	.0359	.0599	.0350	.0396	
Utilities.....	.0052	.0049	.0033	.0072	.0048	.0073	.0031	.0052	
Overhead.....	.0075	.0053	.0090	.0067	.0067	.0043	.0158	.0082	
Other 1/.....	.0047	.0017	.0021	.0056	.0022	.0025	.0094	.0044	
Total.....	.0644	.0753	.0862	.0805	.0732	.0960	.0829	.0802	
Selling and delivering:									
Route labor....	.0254	.0189	.0346	.0129	.0126	.0361	.0071	.0196	
Sales super- vision.....	.0083	.0048	.0046	.0009	.0005	.0030	.0017	.0032	
Sales promotion:	.0082	.0003	.0038	.0030	.0008	.0038	.0008	.0028	
Truck and supplies.....	.0153	.0115	.0173	.0088	.0079	.0149	.0057	.0110	
Other 2/.....	.0049	.0006	.0023	.0007	.0025	.0039	.0009	.0021	
Total.....	.0621	.0361	.0626	.0263	.0243	.0617	.0162	.0387	
Administration..	.0094	.0102	.0167	.0049	.0084	.0227	.0035	.0101	
Products pur- chased for resale.....	--	.0001	.0036	--	--	.0002	.0006	.0004	
Total.....	.1927	.1818	.2765	.1714	.1937	.2571	.1576	.1973	

1/ Cleaning materials, plant insurance, laundry, uniforms, etc.

2/ Bad accounts, taxes, permits, warehouse, etc.

Products purchased for resale. -- Four of the plants bought cottage cheese for resale. Purchases were usually in small quantities to supplement normal production in the plants. Outside purchases of cottage cheese were more important to Plant C than for any other plant.

Frozen Desserts

Average total cost for each gallon of frozen dessert sold was \$1.15 for the 5 plants (table 8). Ingredients -- milk and nonmilk -- was the biggest cost to the plants. This cost averaged 44.9 cents or about two-fifths of all costs. Processing was the second largest cost at 32.8 cents -- over a fourth of the total. Selling and delivering ranked next in importance at slightly over a fifth. The remaining costs in order of their importance were (1) purchases of frozen desserts for resale, and (2) administration.

Ingredients. -- Three kinds of ingredients were used by the plants in making frozen desserts: Raw cream, milk, and skim milk; manufactured milk products -- mostly nonfat day milk and condensed skim milk; and nonmilk ingredients, such as, sugar, stabilizer, flavor, vegetable fat, etc.

Milk and milk products made up the largest share of total ingredient cost. They constituted about 63.6 percent -- 52.5 percent for raw cream, milk, and skim milk and 11.1 percent for nonfat dry milk, condensed skim milk, etc. Nonmilk products made up the remaining 36.4 percent of ingredient cost.

Ingredient costs per gallon for frozen dessert varied among the plants. Plant E had the highest cost at 57.2 cents -- 65 percent higher than Plant D, which had the lowest cost at 34.7 cents. Most of this difference was due to higher costs for butterfat and nonmilk ingredients.

Processing. -- Costs charged to processing were almost 29 percent of all costs for frozen desserts. Containers accounted for about 48 percent of processing cost and was the most important single cost element. Plant labor -- wages and salaries -- made up 27 percent and was second in importance. The remaining cost elements in order of their importance were overhead, utilities, manufacturing supplies, and other.

Processing costs varied widely among plants. Plant A had considerably higher processing costs than any other plant. Higher container and overhead costs accounted for much of the difference. The extremely high cost for containers was attributed to many causes some of which were differences in size and type of containers, in the prices paid for containers of comparable size and type, or in the quantity used of each size and type, and losses in inventory and operations.

Selling and delivering. -- Selling and delivering accounted for slightly over a fifth of all costs. Labor -- delivery wages and commissions -- was the most important cost element in this function of the plants' operations. It made up almost a third of the total. Costs for truck and truck supplies were almost as high as wages and commissions at slightly over a fourth. Selling costs -- sales managers, salesmen, and promotion -- accounted for slightly under a fourth. Of the remaining cost, depreciation and maintenance of ice cream cabinets accounted for 9.0 percent, storage -- 5.2 percent, and other -- 4.3 percent.

Table 8.--Frozen desserts: Cost of producing and selling, by plant for
5 South Central fluid milk plants, 1960-61

Type of cost	Plants					All plants
	A	B	C	D	E	
	Dollars per gallon					
Ingredients:						
Butterfat.....	.2202	.2926	.1832	.1766	.3035	.2189
Skim milk.....	.0089	.0076	.0167	.0139	.0284	.0126
Procurement.....	.0012	.0163	.0004	.0018	.0079	.0041
Subtotal.....	.2304	.3166	.2004	.1923	.3398	.2355
Manufactured milk products.....	.0414	.0661	.0651	.0365	.0386	.0498
Non-milk products.....	.1894	.1358	.1805	.1184	.1937	.1632
Total.....	.4611	.5185	.4459	.3471	.5721	.4486
Processing:						
Labor.....	.0885	.0980	.0904	.0734	.1051	.0882
Containers.....	.2195	.1324	.1339	.1108	.1196	.1564
Utilities.....	.0274	.0105	.0389	.0136	.0238	.0241
Manufactured supplies.....	.0132	.0085	.0091	.0080	.0108	.0102
Overhead.....	.0779	.0055	.0335	.0231	.0378	.0415
Other 1/.....	.0058	.0037	.0119	.0096	--	.0074
Total.....	.4323	.2586	.3178	.2385	.2972	.3278
Selling and delivering:						
Route labor.....	.1246	.0661	.0640	.0324	.0839	.0779
Sales supervision.....	.0473	.0604	.0359	.0101	2/	.0365
Sales promotion.....	.0363	.0209	.0101	.0342	.0041	.0251
Truck and supplies.....	.0716	.0757	.0769	.0495	.0362	.0670
Ice cream cabinets.....	.0246	.0490	.0237	.0022	.0006	.0227
Storage.....	.0072	.0363	.0144	--	.0160	.0131
Other 3/.....	.0150	.0113	.0055	.0122	.0043	.0109
Total.....	.3265	.3198	.2304	.1405	.1450	.2533
Administration.....	.0397	.0744	.0441	.0209	.0193	.0419
Products purchased for resale.....	.0230	.1495	.0759	.0809	.1027	.0750
Total.....	1.2826	1.3208	1.1141	.8270	1.1363	1.1466

1/ Plant insurance, ad valorem tax, etc.

2/ Included in route labor.

3/ Ice, licenses, permits, collection expense, bad accounts, etc.

Total costs charged to selling and delivering varied widely among plants. Costs for Plants A and B were about 1.3 times higher than Plants D and E. Plant C's costs fell about halfway between the high and low cost plants. Most of the difference between

the high and low cost plants can be found in the cost for labor and delivery equipment and supplies.

Administration. -- Cost of administration -- management, clerical, office supplies, etc. -- charged to frozen desserts averaged 4.2 cents per gallon of sales or 3.7 percent of all costs. Again, as with cottage cheese, no breakdown was available for some plants, therefore, only total cost figures were presented.

Products purchased for resale. -- All plants bought finished products -- mostly novelties -- to complement their own production of frozen desserts. This item cost 7.5 cents per gallon of sales or 6.5 percent of all costs.

Plant B depended more on purchased finished products than did any other plant. It made up about 11 percent of all costs per gallon of sales for this plant. This cost was least important to Plant A, comprising about 2.9 percent of total cost.

PROFITABILITY OF COTTAGE CHEESE AND FROZEN DESSERT OPERATIONS

The extent to which cottage cheese and frozen desserts are a part of fluid milk operations in the South Central area gives some indication as to whether they are profitable. Almost all fluid milk plants in the area make cottage cheese and many also make frozen desserts. Most of the plants that do not make these products buy them for resale. The fact that these operations are numerous does not mean that all are profitable. Some plants find handling the products unprofitable owing to low volume, high cost, inefficient operations, low selling price, or other causes.

Many factors determine the profitability of cottage cheese and frozen dessert operations. Some of them are: Prices paid for inputs, such as ingredients, labor, management, and overhead; yield of finished products per unit of raw ingredients; and net selling prices. The methods used to allocate indirect or joint costs to the various products affect the amount allocated to each product, and this also is a factor in the profitability of any single product.

Cottage Cheese

Net selling prices for cottage cheese averaged 23.4 cents per pound for the 7 plants (table 9). Net selling prices varied considerably among the plants. Plant F received the highest price at 29.4 cents per pound. This was 10.7 cents per pound more than for Plant B but only 1.0 cent more than Plant C.

Variations in average selling prices for cottage cheese among plants could be traced to several causes, including differences in the level of selling prices in the individual markets, in the proportions of total sales at retail, wholesale, and F.O.B. plant, in the proportions of total sales in containers of various sizes, and in the proportion of total sales as creamed and uncreamed (dry curd).

Net return ^{2/} received by all plants for cottage cheese averaged 3.7 cents per pound of cottage cheese (table 10). All plants, except Plant E, made a net return on their cottage cheese operations. Plants D and A had the highest returns at 6.2 cents and 6.1 cents, respectively, with plant G a close third at 5.0 cents per pound. Plants

^{2/} Before income tax, if any.

Table 9.--Cottage cheese and frozen desserts: Net prices received, by plant for
7 South Central fluid milk plants, 1960-61 1/

Product	Plants							All plants	
	A	B	C	D	E	F	G		
----- <u>Dollars</u> -----									
Cottage cheese :									
pound.....	0.2535	0.1869	0.2837	0.2337	0.1911	0.2940	0.2116	0.2344	
Frozen product :									
gallon.....	1.2768	1.3597	1.1332	.9785	1.1616	--	--	1.1883	

1/ Less discounts, etc.

Table 10.--Cottage cheese and frozen desserts: Net returns received, by plant for
7 South Central fluid milk plants, 1960-61 1/

Product	Plants							All plants	
	A	B	C	D	E	F	G		
----- <u>Dollars</u> -----									
Cottage cheese :									
pound.....	0.0608	0.0051	0.0072	0.0623	-0.0026	0.0369	0.0540	0.0371	
Frozen desserts:									
gallon.....	-.0058	.0389	.0191	.1515	.0253	--	--	.0417	

1/ Before income tax, if any.

B and C barely broke even on their operations. The 4 plants with returns less than the average for all plants received 1.9 cents per pound; the 3 plants with returns above the average for all plants received 6.0 cents per pound. In terms of total pounds of cottage cheese sold the 4 plants made an average return of about 1.9 cents for 3.5 million pounds and the 3 plants about 6.0 cents per pound for 3.7 million pounds.

Frozen Desserts

Net selling prices for frozen desserts was \$1.19 per gallon for the 5 plants. Selling prices for frozen desserts among plants varied somewhat less than selling prices for cottage cheese. Plant B received the highest price at \$1.36 per gallon -- about \$0.38 more than Plant D, which received the lowest price.

Many reasons exist for the variation in selling price. Each plant sold frozen desserts which differed as to (1) kind -- ice cream, ice milk, sherbet, mellorine, etc., (2) proportions of each kind sold, (3) butterfat and solids-not-fat content, (4)

proportion of sales in containers of various sizes, (5) and the level of price in each market.

The net return received by the 5 plants for frozen desserts was 4.2 cents per gallon. All plants, except Plant A, made a net return on their frozen dessert operations. Returns varied among plants from 15.2 cents per gallon for Plant D to a minus 0.6 cents per gallon for Plant A. Plant D's return appears to be significantly higher than those of the other plants. In fact, the average return for the others was only 1.1 cents per gallon -- 14.0 cents per gallon less than for Plant D.

APPRAISAL

The price that processors will pay for graded milk to be used in cottage cheese and frozen desserts depends on the availability of alternate sources of ingredients or finished products, competitive position, and profitableness of handling these products. The last factor is covered in this report, the first 2 in a previous report.

The profitableness of handling cottage cheese and frozen desserts varied among the 7 plants. They appeared to bring in a high net return in some plants and a low or negative net return in others. Net return from cottage cheese was negative in one plant, also the net return from frozen desserts was negative in another plant.

Managers of multiple-product plants are more interested in making profit on over-all plant operations than in making a profit on each individual item handled. This does not mean that managers should not or do not strive to make a profit on each item. But in many instances they are "forced" by competition to handle items which make no positive return to over-all plant operations. Their chief aim is to make sufficient returns on enough of the items handled to cover losses on the unprofitable ones.

A limited appraisal can be made on the profitableness of processing cottage cheese and frozen desserts in plants using only graded milk and those using both graded and ungraded milk. The indication of profitability used is cost per dollar of sales. Total cost per dollar of sales for the combined products was 92.9 cents for the 5 plants using only graded milk and 85.8 cents for the 2 plants using both grades of milk.

The greater returns for the two plants does not necessarily mean they enjoyed lower unit costs for milk ingredients. Cost of milk ingredients per pound of cottage cheese was 7.1 cents for the 5 plants and 5.9 cents per pound for the 2 plants. The higher cost for the 5 plants was due largely to much higher prices for skim milk in 2 markets. This cost relationship was reversed for frozen desserts. Milk ingredient cost per gallon was 27.0 cents for the 3 plants using only graded milk and 31.0 cents per gallon for the 2 plants using both grades.

APPENDIX

Cost Allocation Procedures

Ingredients. -- Three types of ingredients were used in cottage cheese and frozen desserts. Raw milk, cream, and skim milk; manufactured milk products -- nonfat dry milk, condensed milk products, and butter; and nonmilk ingredients, such as salt and culture for cottage cheese and sugars, stabilizers, emulsifiers, flavors, nuts, fruits, etc., for frozen products.

Two methods were used to assign values to butterfat and skim milk obtained from raw milk. Federal order Class II and Class III prices were used to assign values to butterfat and skim milk obtained from surplus graded milk. But plants purchasing ungraded milk usually paid for it on a straight butterfat basis. This method of purchase places all the value on the butterfat portion of the milk. Ungraded milk competes with surplus graded on a usage basis, therefore, the cost of this milk was allocated to butterfat and skim milk by a method which reflected the proportionate values of butterfat and skim milk in surplus graded milk.

Various methods were used to price manufactured milk products used in cottage cheese and frozen desserts. The buying price was used for those plants purchasing the products and the average selling price for those plants selling the products on a commercial basis. Average cost for ingredients, labor, and other plant costs were used to price those products for which a market value could not be established.

Processing.--Processing costs were classified as direct and indirect. For the purpose of this study, only plant labor, packaging supplies, and machinery and equipment depreciation were classed as direct. All or parts of all other processing costs -- building depreciation, utilities, etc.-- could be charged directly to specific products. But as considerable time, effort, and money would be needed to allocate these costs directly, they were treated as indirect costs.

Direct costs were charged to the product by various methods. Plant labor was charged to product according to what was paid employees who worked in each product department. Containers and other packaging supplies were charged to product according to the actual usage of supplies. Machinery and equipment depreciation was charged to product on the basis of the machinery equipment used in each department.

Indirect costs--building, labor, utilities, maintenance and repair, general plant supplies, laboratory, insurance--were charged to product according to the proportion of milk receipts utilized in these products.

Sales and Delivery.--Selling and delivering costs can also be broken down into two parts--direct and indirect. Only for frozen desserts were any costs charged directly. Most plants had specialized frozen dessert routes but not all kept these costs separate from their mixed product routes. In order to make the cost somewhat comparable among plants, all selling and delivering costs, except the specialized items, were treated as joint or common costs and allocated to product on a product value basis, i.e., cost was allocated by using the proportionate shares that cottage cheese and frozen desserts sales were of total route sales.

General Administration.--All cost of general administration--management salaries, clerical salaries, office supplies, etc.--was charged to products on a proportionate product value basis. This is the same method used to allocate joint selling and delivering costs except for the fact that the proportionate shares are in relation to total sales instead of total route sales.

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