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NEED FOR RESTRUCTURING DAIRY COOPERATIVES

By George C. Tucker

U.S. DEPARTMENT OF AGRICULTURE
FARMER COOPERATIVE SERVICE
WASHINGTON, D.C.

UNITED STATES DEPARTMENT OF AGRICULTURE
FARMER COOPERATIVE SERVICE
WASHINGTON, D. C.

Farmer Cooperative Service provides research, management, and educational assistance to cooperatives to strengthen the economic position of farmers and other rural residents. It works directly with cooperative leaders and Federal and State agencies to improve organization, leadership, and operation of cooperatives and to give guidance to further development.

The Service (1) helps farmers and other rural residents obtain supplies and services at lower cost and to get better prices for products they sell; (2) advises rural residents on developing existing resources through cooperative action to enhance rural living; (3) helps cooperatives improve services and operating efficiency; (4) informs members, directors, employees and the public on how cooperatives work and benefit their members and their communities; and (5) encourages international cooperative programs.

The Service publishes research and educational materials and issues News for Farmer Cooperatives. All programs and activities are conducted on a nondiscriminatory basis without regard to race, creed, color, sex, or national origin.

July 1972

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UNITED STATES DEPARTMENT OF AGRICULTURE
FARMER COOPERATIVE SERVICE
WASHINGTON, D. C.

August 9, 1972

E R R A T A

NEED FOR RESTRUCTURING DAIRY COOPERATIVES, FCS SERVICE REPORT 125, JULY 1972

The following corrections should be entered in the above report:

Page 6: 6th par. 1st line, change "lent" to "led."

Page 11: 1st par. insert between 5th and 6th lines "by the major cooperative, but not below the minimum prices established."

NEED FOR RESTRUCTURING DAIRY COOPERATIVES

by George C. Tucker

This report gives the results of the first phase of a two-phase study made by Farmer Cooperative Service, U.S. Department of Agriculture, at the request of directors of Central America Cooperative Federation, Inc. (CACF), Louisville, Ky. A later report will deal specifically with the feasibility of further unification of CACF's member cooperatives both through a federation and through a centralized cooperative.

This report examines the overall need for restructuring dairy cooperatives. It includes a review of the development of dairy cooperatives and dairy marketing trends, an analysis of potential benefits to dairy-men from a fully coordinated cooperative marketing program, and a plan for equitably distributing marketing proceeds to members.

DEVELOPMENT OF DAIRY COOPERATIVES

Dairy farmers pioneered in applying cooperative principles to marketing farm products. They cooperated in making cheese as early as 1810. By 1875 there were several cases where farmers had used cooperatives in making butter and cheese, and at least one case of their forming an association for cooperatively marketing milk.

Then, during the late 1880's and 1890's, there was considerable activity in forming cooperative creameries and cheese factories.

By 1911 cooperative creameries totaled more than 2,000--about one-third of all creameries--and cooperative cheese factories about 350--almost one-tenth of all cheese factories. Many early fluid milk associations were short-lived; they would operate for a time and then fold to be followed by another attempt.

The United States' entry into World War I gave an impetus to dairy cooperative marketing, particularly in areas marketing fluid milk and cream. The Federal Food Administrator made it quite clear to farmers that it was easier for him to deal with them when they operated through organized groups.

During and after World War I, milk and cream marketing organizations made rapid progress. In many marketing areas, farmers' attempts to organize were bitterly contested by distributors and milk wars or strikes often resulted. The effect of these milk strikes was to greatly speed up the securing of contracts by the bargaining associations with their members.

By the mid 1920's it was apparent that creameries and cheese factories were increasing in size. Also, they were using federated organizations in marketing their products. In 1911 Challenge Cream and Butter Association, Los Angeles, Calif., began operations as a sales agency for a group of cooperative creameries in California and later included creameries in a number of Western States. Farmers in Minnesota formed Minnesota Cooperative Creamery Association in 1921. This association began its work on a program of quality production of butter in 1922 and in 1923 undertook to sell butter for its member creameries. During 1926 its name was changed to Land O'Lakes Creameries, Inc.

Over the years the pattern has been for farmers to join dairy cooperatives during periods of economic stress. Membership in these associations rose sharply during the bitter depression years of the early 1930's, declined during the latter part of that decade, rose again during the challenging period of World War II, and hit an all-time high in 1952.

The number of dairy cooperatives increased sharply during the 1920's, leveled off during the 1930's and began a continuous decline in the early 1940's. The number of dairy cooperatives by States for selected years is shown in table 1.

In 1930, 86 percent of the Nation's dairy cooperatives were located in the North Central region; 63 percent were in two states, Minnesota and Wisconsin.

Percentages of dairy cooperatives in Minnesota, Wisconsin, West North Central region, East North Central region, and all other regions of the Nation during selected years were:

Year	West North Central region		East North Central region		All other regions	Total
	Minn.	Total	Wis.	Total		
<u>Percent</u>						
1930	27	41	36	45	14	100
1940	26	45	30	39	16	100
1950	28	49	24	32	19	100
1960	26	48	18	25	27	100
1970	30	44	20	26	30	100

Table 1.--Number of farmer cooperatives primarily marketing dairy products, by geographic region and State, 1930, 1940, 1950, 1960 and 1970

Geographic region and State	: 1930	: 1940	: 1950	: 1960	: 1970
<u>New England:</u>					
Maine	4	3	2	3	2
New Hampshire	2	3	4	4	3
Vermont	35	31	17	15	10
Massachusetts	12	11	10	8	3
Rhode Island	2	1	2	1	--
Connecticut	4	4	4	5	3
Total	59	53	39	36	21
<u>Middle Atlantic:</u>					
New York	50	79	87	116	104
New Jersey	--	2	2	3	7
Pennsylvania	38	32	31	41	38
Total	88	113	120	160	149
<u>East North Central:</u>					
Ohio	33	36	37	32	18
Indiana	32	27	19	15	5
Illinois	71	80	65	40	21
Michigan	82	66	42	28	15
Wisconsin	889	714	477	294	188
Total	1,107	923	640	409	247
<u>West North Central:</u>					
Minnesota	657	632	557	411	287
Iowa	258	280	255	173	68
Missouri	12	15	19	52	7
North Dakota	22	34	39	34	18
South Dakota	28	50	51	43	22
Nebraska	26	47	40	38	11
Kansas	6	16	17	27	3
Total	1,009	1,074	978	778	416
<u>South Atlantic:</u>					
Delaware	--	--	--	--	--
Maryland	3	4	6	3	5
District of Columbia	--	--	--	--	--
Virginia	13	11	15	18	6
West Virginia	1	2	1	4	4
North Carolina	8	7	12	14	5
South Carolina	--	--	--	4	4
Georgia	--	7	17	11	8
Florida	--	4	3	9	8
Total	25	35	54	63	40

--Continued

Table 1.--Continued

Geographic region and State	:	:	:	:	:
	:	:	:	:	:
	1930	1940	1950	1960	1970
	:	:	:	:	:
<u>East South Central:</u>					
Kentucky	6	3	3	6	3
Tennessee	16	9	9	6	5
Alabama	2	--	4	1	1
Mississippi	1	3	2	7	--
Total	25	15	18	20	9
<u>West South Central:</u>					
Arkansas	--	--	3	1	--
Louisiana	1	3	5	5	3
Oklahoma	8	15	12	12	--
Texas	9	6	10	10	4
Total	18	24	30	28	7
<u>Mountain:</u>					
Montana	6	11	8	7	5
Idaho	11	12	13	10	4
Wyoming	3	8	5	1	2
Colorado	6	11	9	7	5
New Mexico	3	--	1	1	--
Arizona	--	3	2	3	1
Utah	7	8	9	10	5
Nevada	--	--	2	3	1
Total	36	53	49	42	23
<u>Pacific:</u>					
Washington	28	30	21	18	6
Oregon	43	39	31	24	7
California	20	36	28	29	29
Total	91	105	80	71	42
TOTAL				1,607	954
Alaska	--	--	--	2	1
Hawaii	--	--	--	--	1
United States total	2,458	2,395	2,008	1,609	956

Between 1930 and 1970 the total number of dairy cooperatives decreased from 2,458 to 956, a decline of 61 percent. The proportion of total dairy cooperatives in the West North Central region increased during the 1930 to 1950 period and has since declined at an increasing rate. Minnesota's proportion, on the other hand, fluctuated somewhat differently rising to a record high in 1970 indicating a slower decline in number of cooperatives than the rest of the Nation. The proportion of total cooperatives for both the East North Central region and Wisconsin declined sharply during the 1930-60 period, but increased slightly during the 1960's. The proportion of dairy cooperatives in regions other than the North Central region has consistently increased since 1930.

The overall objective of the different kinds of dairy cooperatives has been the same, increased returns to farmer-members. The approaches taken by different producer groups, however, have varied considerably. Also changes in marketing conditions have led to changes within the different groups.

Cooperative Creameries

Perhaps the chief reason farmers organized cooperative creameries was to protect themselves against abuses existing in local markets. In some cases these resulted from lack of competition among dealers; in others, from excessive competition; and in some communities no satisfactory outlets were conveniently accessible. Producers as a rule did not know the actual market value of butterfat and were unable to check weights and tests of cream.

A number of the early cooperative creameries were formed by professional promoters serving as agents for development companies. Generally, the agents attempted first to sell the creamery idea to the businessmen, then to the local farm leaders. On the other hand, stock sales were made first to producers of the area, and later, if the sales to these prospects did not provide funds to fulfill the development contract, to the townspeople.

Optimistic promises as to butterfat prices and dividend payments were almost universally made to prospective members. This put the associations under immediate pressure and often precluded the adoption of sound financial practices at the start.

Essentially all of the cooperative creameries started by promoters were the stock type of corporate organization. Businessmen and retired farmers in the community often held large amounts of stock which weakened producers' control.

Many producers considered the local cooperative creamery as simply another outlet for butterfat. Some chose to be nonmember patrons indicating that they were not willing to assume the obligations for financing or controlling the cooperative nor the responsibility for its perpetuation.

In the nonstock organizations producers generally became members automatically by patronizing the organization.

During World War II, demand for dairy products increased greatly. A number of milk drying plants were built, some with Government assistance, for operation by dairy cooperatives. By this time many creameries had expanded their operations to include receipt of whole milk. At first the creameries shipped the skim milk to the milk drying organization. Later they chose to ship whole milk to the drying plant which also had facilities for making butter at lower costs than the local creameries.

During the 1950's producers began installing farm tanks for shipment of milk in bulk. Initially it was the large-volume producers shipping Grade A milk who installed farm tanks. Later producers of manufacturing grade milk began using them. With shifts to Grade A milk production and to bulk assembled milk, local creameries were faced with the choice of either providing services desired by these members or losing them to some other organization.

Continued shifts to bulk assembled milk have greatly reduced the need for local cooperatives operating as creameries or as milk receiving stations since bulk milk is more efficiently moved directly from farm to manufacturing plant. Most local creameries are much too small to be effective in marketing Grade A milk to fluid milk outlets.

The declining role of local cooperative creameries has lent to centralization of the milk drying cooperatives and their member cooperatives. However, such moves often appear to be too little and too late since the surviving organizations generally do not have adequate volume or the modern equipment needed to continue as viable organizations.

Cooperative Cheese Factories

Since successful cheesemaking requires a person skilled in the art, the first cheese factories were formed by small groups of neighboring farmers who found it more convenient to haul their fresh milk to a common point where it could be combined to make cheese than to try to do it individually.

In forming a cheesemaking cooperative, farmers often provided the original capital for the building and hired the cheesemaker who furnished the equipment. Factories established by cheesemakers were usually operated as private enterprises.

Cooperative cheese factories used a pooling system to distribute net proceeds from sales among farmers who provided the milk according to the amount and quality delivered.

Since World War I the trend has been toward fewer and larger cheese factories. Nevertheless, the little crossroads factory has continued to be the typical cooperative type. These now face new problems in whey disposal as well as increased competition from the use of automated equipment in larger cheese factories.

Fluid Milk Distributing Cooperatives

Milk producers' objective in forming many of the early associations was retail distribution. They believed the distributor was getting more than his share of the consumer's dollar. By retailing the milk used for fluid consumption and manufacturing the remainder, they reasoned that they would not only receive the same wholesale price they received under the private distributor system but would also obtain the distributor's share of the profits, which they believed to be exceptionally large.

These cooperatives were established principally in small or medium-sized cities. Plant operations were usually on a small scale with distribution at retail. Milk supplies came from nearby member-farms. This made it easy for members, who as a rule were personally acquainted, to get together in their cooperative effort.

Many of the fluid milk distributing cooperatives were formed during two 5-year periods of marked activity. The first period included the years 1919 to 1923; the second, the years 1932 to 1936. A principal reason for the concentrated activity during these particular years was the pressure of economic conditions. During the first period, milk prices had lagged far behind prices for other agricultural products. The alternative of shifting to other lines of production was not attractive to fluid milk producers favorably located in relation to their market. In the second period, shifting price relationships emphasized the disparity between farm and retail prices for milk.

Beginning in 1921, increasing demand for pasteurized milk in small towns and the growing tendency for creameries to have pasteurizing equipment for handling fresh milk led dairy manufacturing cooperatives to milk distribution as a sideline.

With the development of State and Federal regulations of fluid milk marketing, fluid milk distributing cooperatives generally favored an individual handler type of pooling. By limiting their membership and their milk supplies, they were able to maintain a high Class I utilization and pay producers a blend price higher than the market average.

During recent years the trend has been toward marketwide pooling systems. This has eliminated the benefits that fluid milk distributing cooperatives obtained through higher than the market average Class I utilization. Also, shifts to fluid milk processing by food chains have made it more difficult for distributing cooperatives to obtain adequate volume for efficient operations. Several cooperatives have terminated their fluid milk packaging and distributing operations, thus indicating that the volume of milk cooperatives package and distribute may be declining. In 1964 their distribution of total sales was less than 10 percent.

Fluid Milk Bargaining Cooperatives

The major objectives in organizing fluid milk bargaining associations were to correct unsatisfactory market practices by cooperative action and to work toward higher prices. Individual farmers had found themselves dealing with commercial units that held more or less a monopoly on the purchase of milk for fluid use. Milk dealers were charged with playing one producer against another, or even one group or area against another, and buying on their own terms. This resulted in: (1) Low prices to producers, (2) dissatisfaction with weights and tests, and (3) loss of market for many producers during the heavy production season. In some areas dealers bought milk on a flat-price basis without regard to use or test. Frequently there were variations in prices between dealers and wide seasonal variations in prices.

Generally bargaining associations began with little capital and no facilities for physically handling milk. Their bargaining strength depended largely on the support given by all producers in the market. Members were bound together by uniform milk marketing agreements between each producer and the association. The agreements generally provided for deductions of a few cents a hundredweight to be paid to or retained by the association in payment for its services as marketing agent.

Bargaining associations found that difficulties with surplus milk (supplies not needed for fluid use) were among the chief obstacles to be overcome. To this end they pioneered pricing milk to plants on a classified basis according to use. They also pioneered pooling procedures for producer payments, use of butterfat differentials, delivery point location differentials, and audit procedures to assure proper accounting to producers and to provide checks on weights and tests of milk.

The restricted or local nature of the fluid milk markets during the 1920's enabled bargaining cooperatives to maintain sufficient control over available supplies to operate successfully. In fact some might argue that they operated too successfully in view of the general economic conditions prevailing at that time. The relatively favorable income position of dairying compared with other agricultural alternatives attracted additional and largely unneeded resources into dairying. Milk production rose from 87 billion pounds in 1924 to 102 billion pounds in 1933.

With fluid milk supplies growing much faster than utilization, the problem of surplus milk was greatly intensified. In some areas surplus milk was viewed mainly as a seasonal occurrence resulting from lack of close adjustment between production and consumption. However, the burden of surplus milk in each milkshed was unevenly distributed among the dealers and groups of producers. In general, the larger distributors had a higher percent of milk going into surplus uses than the small distributors. Also, the problem of surplus milk was usually greater in the larger milk sheds than in the smaller ones.

The surplus milk problem was attacked in several ways by different producer groups. However, with expanding milk supplies, handlers were able to get part of their milk from noncooperative sources at lower prices than the associations charged. Thus, the associations were obligated to carry a growing share of the markets' surplus milk. This further diluted their blend prices paid to members. The lower blend price created further incentive for members to withdraw from the associations and market their milk independently at prices above those the associations paid.

The breakdown of milk pricing systems established through direct handler-association negotiations resulted in the associations seeking Government assistance to help overcome the problem of nonmember milk supplies. The Federal Government responded with a program of Federal milk marketing agreements and orders. Some State Governments responded with milk marketing regulations. The Federal milk marketing orders were modeled largely after existing cooperative marketing programs, but served to expand the program to the total market. They implemented uniform prices for milk according to use to all handlers in each market. Nonmembers were assessed a marketing service charge for checks on tests and weights and market information. The charges for rendering these services to nonmembers by the market administrator were comparable to the dues cooperatives deducted for providing similar services. This tended to eliminate members' complaints that nonmembers were enjoying a "free ride" by sharing in the benefits to all producers generated by the cooperative without paying any of the costs.

Under the market order program, associations have experienced relatively stable marketing conditions. Several cooperatives were formed in unorganized markets during the 1940's and 1950's. Also the Federal milk marketing order program was expanded to new areas at the request of producers. Declining milk prices during the mid-1950's, however, created a wave of producer unrest. The practice of associations charging handlers more than the order minimum class prices was initiated in a few markets.

Introduction of farm tanks for bulk milk assembly triggered the development of new marketing systems. For years associations had struggled with ways of gaining control of their milk supplies to strengthen their bargaining position. Bulk milk assembly offered this control plus considerable flexibility in moving milk direct from farms to alternative marketing outlets.

A first goal of producers was to obtain a share of the cost-savings that plants gained by shifting from can to bulk milk assembly. In some cases the various cooperatives serving a market joined in a federated organization to obtain a premium price for the markets' tank-assembled milk.

The shift to farm tanks resulted in a dramatic increase in the volume of milk produced by bulk milk shippers. Although the number of producers shipping Grade A milk declined, total volume of milk increased causing lower blend prices.

It became apparent that the surplus milk in most markets could be best handled by one organization. Cooperatives responded to this challenge and assumed the responsibility for directing milk movements to handlers according to their needs and for disposing of surplus supplies. Many handlers turned their supply procurement and producer-related activities over to the association. This permitted them to concentrate their own efforts on packaging and distribution.

The added responsibility for increased field service, supply management, disposition of surplus Grade A milk, increased accounting, and producer payroll work made it necessary for the associations to add a service charge or increase the price of their milk above the Federal order minimum prices.

Low prices during the early 1960's combined with increased intermarket shipments of milk led to the formation of two large regional bargaining federations. These organizations were successful in obtaining over-order prices in most fluid milk markets in the central part of the Nation.

While over-order prices demonstrate bargaining strength, they create a weakness in the cooperative's marketing system. They provide non-member producers and independent cooperatives an opportunity to increase their returns (blend prices) by selling milk to handlers with high Class I utilization for less than the prevailing price established by the order. The problem is increased where handlers purchase all or part of their basic supplies from nonmember producers and independent cooperatives and depend on the major cooperative for their remaining supply needs. This enables the independents to shift the full burden for certain marketing services such as surplus milk disposal and supply management to the major cooperative.

The large bargaining federations recognized that the weakness in the over-order pricing system could lead to withdrawal of some member cooperatives in an effort to obtain benefits as independent organizations. Also the federated approach in establishing milk prices over a large multimarket area proved to be somewhat cumbersome. To avoid these problems member cooperatives have taken steps toward forming a few large centralized organizations.

MARKETING TRENDS^{1/}

The market situation in the dairy industry has changed greatly during recent years. The trend has been toward fewer but larger scaled operations by both plants and producers.

Fluid milk plants are being modernized to handle large volumes more efficiently. Their methods of distribution are changing from glass bottles to paper cartons or plastic containers and from home delivery to wholesale outlets. With improved roads, both raw milk and packaged milk products can be readily transported over wider areas.

^{1/} This chapter is based on a merger study made by a committee of university economists together with Farmer Cooperative Service at the request of Associated Milk Producers, Inc., San Antonio, Tex.; and Dairymen, Inc., Louisville, Ky. The committee included Dr. W. H. Alexander, Louisiana State University; Dr. C. R. Berry, University of Arkansas; Dr. H. L. Cook, University of Wisconsin; Dr. M. C. Conner, Virginia Polytechnic Institute and State University; Dr. V. G. Hurt, Mississippi State University, Chairman; J. B. Roberts, University of Kentucky; Dr. J. R. Strain, Iowa State University; G. C. Tucker, Farmer Cooperative Service; and Dr. L. E. Wilson, Auburn University.

The number of firms packaging and distributing fluid milk is declining rapidly, particularly those handling relatively small volumes. Farmers who cooperatively market their milk as packaged fluid products face increasing competition from firms with large, modern, automated facilities seeking additional volumes to effect cost savings. With the shift to private label distribution by food chains and others, the opportunities for farmers to expand their distribution except through private label outlets is diminishing. Also, farmers who market raw Grade A milk face increasing buying power from the fewer and larger fluid milk handlers.

Dairy herds are becoming larger and use of labor-saving equipment on farms is increasing. Since the mid-1950's, there has been an almost complete shift from can to bulk assembly in most fluid milk markets. The chore of milking has been reduced by use of pipeline milkers, bulk tanks, and automated feeding and cleaning equipment.

Changes in the dairy industry have not been limited to the fluid milk sector. Manufacturing milk plants are also being modernized to handle larger volumes more efficiently. They are developing new products and new techniques for handling existing products. Much of the non-Grade A milk supply has shifted from can to bulk assembly. Dairymen are also rapidly shifting from non-Grade A to Grade A milk production.

Dairy cooperatives are becoming larger and expanding their services both in areas served and in services provided. Dairymen shipping Grade A milk are assigning greater marketing responsibilities to their cooperatives. They depend on their cooperatives to find or develop market outlets, direct the movement of milk from farms, check on test and weight, and pay for their share of the returns.

Dairy Farm Changes

In 1910, 5.1 million of the Nation's 6.4 million farms (80 percent) reported milk cows. Herd size averaged only 3.3 cows. By 1965 the total number of farms was 3.2 million and those reporting milk cows had declined to 1.1 million--36 percent of total. Herd size had increased to 12.9 cows (table 2). In 1969 farms with milk cows had declined to 568,000 while the average herd size had increased to 20.

Table 2.--Number of farms, farms reporting milk cows, milk sold, cream sold, and average herd size, and sales per farm, United States, selected years, 1910-1970^{1/}

Year	Farms reporting milk cows		Farms reporting milk sold		Farms reporting cream sold		Average volume per farm
	Thousands	Number	Thousands	Thous. lbs.	Thousands	Butterfat lbs.	
1910	6,366	5,141	3	499	33	361	846
1920	6,454	4,461	4	711	31	875	608
1930	6,295	4,453	5	894	43	1,556	758
1940	6,102	4,644	5	954	48	1,460	747
1950	5,388	3,648	6	1,097	62	862	676
1955	4,782	2,936	7	934	88	541	851
1960	3,711	1,792	9	770	127	262	967
1965	3,158	1,134	13	545	197	103	1,241
1970	2,730	568	20	^{2/} 360	^{3/}	^{3/}	^{3/}

^{1/} Census of Agriculture data for selected census years.

^{2/} Number of farms selling dairy products with sales of \$2,500 and over.

^{3/} Not available.

Farms selling whole milk increased from about 500,000 in 1910 to almost 1.1 million in 1950 before beginning a dramatic decline to about 360,000 in 1969. Milk sold per farm has increased continually since 1920. The number of farms reporting cream sold increased rapidly from 1910 to 1930, remained at a relatively constant level during the 1930's, and has since declined.

By 1971 almost 98 percent of the milk marketed by farmers was sold to plants and dealers as whole milk. About 1 percent was sold as farm separated cream and the remainder, marketed at retail.

The change toward more commercial dairy farming is reflected in the number of herds of various sizes. Between 1950 and 1969, the number of farms reporting 1-19 milk cows declined by 90 percent from almost 3.5 million to 363,000. At the same time farms with 20-49 milk cows declined by 5 percent. On the other hand, farms reporting more than 50 milk cows increased sharply (table 3).

Table 3.--Number of farms reporting milk cows, by size of herd, United States, selected years, 1950-1969

Size of herd	: 1950	: 1954	: 1959	: 1964	: 1969	: Change
	:	:	:	:	:	:1950-69
	<u>Thousand farms</u>					<u>Percent</u>
1-19 milk cows	3,466	2,713	1,572	872	363	-90
20-49 milk cows	166	221	230	215	157	-5
50-99 milk cows	13	19	28	38	39	+200
100 & over milk cows	3.6	4.7	6.6	8.9	9.9	+175

Although the average number of milk cows per farm has been increasing, total number of cows declined 44 percent between 1950 and 1971 (table 4). During the same period, milk production per cow increased 81 percent. Total milk production in 1950 was almost the same as that for 1969. Milk production in 1971 was 2 percent greater than in 1969, but almost 7 percent less than the peak year 1964.

Geographic Changes in Milk Production

While the Nation's milk production in 1970 was slightly greater than in 1950, it had declined in 30 of the 48 continental States. All regions had some states with increasing and some with decreasing supplies. Generally, it was the largest milk producing States in each region that were gaining a larger share of the Nation's milk production. States with as much as a 0.5 percent gain in their share of total production for the continental 48 States were as follows:

Table 4.--Number of milk cows, milk production per cow, and total milk production, United States, selected years, 1925-1971

Year	: : Number of : cows	:Average produc- : tion per cow	: : Milk : production
	<u>Thousand</u>	<u>Pounds</u>	<u>Million pounds</u>
1925	21,503	4,218	90,699
1930	22,218	4,508	100,158
1935	24,187	4,184	101,205
1940	23,671	4,622	109,412
1945	25,033	4,787	119,828
1950	21,994	5,314	116,602
1955	21,044	5,842	122,945
1960	17,515	7,029	123,109
1961	17,243	7,290	125,707
1962	16,842	7,496	126,251
1963	16,260	7,700	125,202
1964	15,677	8,099	126,967
1965	14,954	8,304	124,173
1966	14,093	8,507	119,892
1967	13,501	8,797	118,769
1968	13,038	8,992	117,234
1969	12,693	9,166	116,345
1970	12,483	9,385	117,149
1971	12,347	9,609	118,640

<u>State</u>	<u>Share of total production</u>		<u>Gain in share of total production</u>
	<u>1950</u>	<u>1970</u> <u>Percent</u>	<u>1950 to 1970</u>
Wisconsin	12.7	15.6	2.9
New York	7.6	8.9	1.3
Minnesota	6.9	8.3	1.4
California	5.1	8.1	3.0
Pennsylvania	4.8	6.1	1.3
Florida	0.5	1.4	0.9

Other States increasing their share of total production included Vermont, Louisiana, Idaho, Washington, Arizona, Maryland, Utah, South Dakota, New Mexico, and Nevada.

This indicates some areas are becoming more highly specialized in milk production. With a growing interest in Grade A milk production, we can expect these areas to seek additional outlets for fluid milk. This underscores the need for unified marketing by farmers in both the surplus producing and in the consuming areas if milk is to be moved efficiently from farms to market.

Conversion to Grade A Milk

More and more of the Nation's milk supply is becoming eligible for fluid use (Grade A). In 1955, 63 percent or 57 billion pounds of the milk sold to plants and dealers was approved for fluid use (table 5). By 1971, the Grade A milk sales had increased to 85 billion pounds or 76 percent of the total. During this 16-year period, Grade A milk sales grew at the rate of 2.3 percent a year. At the same time, total volume sold to plants and dealers rose from 91 billion pounds to 112 billion pounds, an annual rate of 1.3 percent. Non-Grade A milk declined from 34 billion pounds to 27 billion pounds, an average rate of 1.4 percent a year.

Sales of fluid milk products, based on product weight, increased from 48 billion pounds in 1955 to 58 billion pounds in 1966. The yearly rate of increase during this period was 1.7 percent. Since 1966, sales of fluid milk products have remained relatively constant.

The more rapid growth in Grade A milk supplies than in the sales of fluid milk products has resulted in a smaller portion going into fluid uses. For example, in 1955, 84 percent of the Grade A milk was utilized in fluid milk products. By 1971, this utilization had declined to 69 percent.

Table 5.--Total milk marketings, amount approved for fluid use, and amount actually used in fluid milk products, United States, 1955-1971

Year	: All milk sold :		Milk approved		: Fluid milk :		Percent
	Billion lbs.	to plants and : dealers in U.S. :	for fluid use ("Grade A")	for fluid use ("Grade A")	product sales : used in fluid	:(Product weight):milk products	
1955	91	57	63	48	84		
1956	96	61	64	50	82		
1957	98	63	64	51	81		
1958	100	65	65	52	80		
1959	101	66	66	52	78		
1960	104	70	67	53	76		
1961	108	73	67	53	73		
1962	111	74	67	54	73		
1963	111	76	68	55	73		
1964	114	78	68	56	73		
1965	113	78	69	58	74		
1966	110	76	69	58	77		
1967	109	77	70	58	75		
1968	109	76	70	58	77		
1969	109	79	73	59	75		
1970	110	82	74	58	72		
1971	112	85	76	59	69		

Source: Dairy Situation, November and May 1969 and 1970, Economic Research Service, USDA.
Milk Production, Disposition and Income, 1970-71, Da I-2 (72), Statistical Reporting Service, USDA.

Although some non-Grade A milk was produced in 29 States during 1971, 70 percent of the total volume was produced in five States with over a billion pounds each, namely Wisconsin, Minnesota, Iowa, South Dakota, and Idaho. Two States, Wisconsin and Minnesota, supplied more than half of all non-Grade A milk.

There is considerable variation among States in the percentage of milk production eligible for fluid use. For example, in 1971 only 17 percent of South Dakota's milk sold to plants and dealers was Grade A while in 29 States 90 percent or more of the milk sales were Grade A. Of the seven States with less than 60 percent of their milk eligible for fluid use, five were located in the West North Central region. In fact, all States in this region except Kansas and Missouri were in the below 60 percent group. The other two States were Wisconsin with 57 percent Grade A and Idaho with 28 percent.

In many States where all the milk produced is Grade A, substantial quantities are used in manufactured milk products. For example, practically all the milk produced in the North Atlantic States is eligible for fluid use (table 6). However, about 30 percent of this milk was used to produce manufactured products during 1970.

Table 6.--Fluid grade milk as percent of all milk sold by farmers to plants and dealers, by regions, selected years, 1955-71^{1/}

Year	Atlantic		North Central		South	Western	United
	North	South	West	East	Central		States
<u>Percent</u>							
1955	98	87	34	48	67	64	63
1960	99	90	31	55	73	74	67
1961	99	90	30	57	73	75	67
1962	99	91	29	58	74	76	67
1963	99	92	29	60	75	78	68
1964	99	92	28	59	76	82	68
1965	99	93	28	60	78	82	69
1966	99	94	28	61	80	84	69
1967	99	94	29	60	80	84	70
1968	99	95	31	62	81	84	70
1969	99	95	35	66	83	85	73
1970	99	96	38	68	84	85	74
1971	99	97	40	70	85	85	76

^{1/} Percentage eligible for fluid use (Grade A in most states). Includes fluid grade milk used in manufactured products.

One of the major problems the dairy industry faces today is the orderly accommodation of additional supplies resulting from conversion of large quantities of non-Grade A milk to Grade A. Producers of non-Grade A milk are rapidly converting from can to bulk milk assembly. Although the number of producers is declining, those that remain are increasing the size of their herds and upgrading the quality of their milk. A number of States are implementing regulations designed to improve the quality of non-Grade A milk. As additional pressures are exerted to upgrade non-Grade A milk, producers will often find that they can make changes to qualify for Grade A milk production with very little more expense than that required to meet the minimum requirements to produce any milk for sale.

Changes in Demand for Milk and Milk Products

The Nation's demand for milk depends largely on its population and the people's willingness and ability to purchase dairy products. Although there is some demand for dairy products by manufacturers of animal feed and nonfood products, it is not great and serves mainly as an outlet for products not suitable for human consumption.

Table 7 shows factors influencing and indicative of the demand for milk and dairy products during the 1950-71 period. Total population during that period increased 36 percent but growth now has slowed to about 1 percent a year. If per capita consumption of milk had remained constant, total consumption would be up 36 percent. Instead per capita consumption was down by 25 percent on a fat-solids milk equivalent basis, and thereby limited growth in total consumption for the period to 2.7 percent. Per capita consumption declined over the period by all available measures. However, using a solids-not-fat basis or a calcium content basis, the decline is much smaller, 6 percent and 3 percent respectively.

Per capita disposable incomes deflated by the consumer price index in 1971 were up 56 percent from 1950. This leaves out most of the effects of inflation indicating that the decline in per capita consumption did not generally result from people's inability to buy dairy products.

In terms of individual dairy items, per capita consumption increased for low-fat fluid milk, all cheeses, and ice milk. Since 1950, the per capita consumption of American cheese has increased 29 percent; other cheese, 100 percent; and cottage cheese, 68 percent (table 8). Ice milk made dramatic gains during the 1950's and has increased 71 percent since 1960. On the other hand, per capita consumption of butter has declined 50 percent and evaporated and condensed milk 63 percent since 1950.

Table 7.--Factors influencing and indicative of the demand for milk and dairy products, United States, 1950-71^{1/}

Year	Total population July 1 (including Armed Forces overseas)	Total civilian employment	BLS consumer price index 1967=100	Per capita disposable income		Civilian per capita disappearance								
				Million	Million	: Deflated		: Milk equivalent						
						Dollars	Dollars	Pounds	Pounds	: Milk solids				
										Actual	by	Fat solids basis	Calcium content basis	Milk-fat
1950	151.7	58.9	72.1	1,364	1,892	740	507	29.3	43.6					
1955	165.3	62.2	80.2	1,666	2,077	706	525	27.2	44.5					
1960	180.7	65.8	88.7	1,937	2,184	653	512	24.5	43.4					
1961	183.7	65.7	89.6	1,984	2,214	641	505	24.0	43.0					
1962	186.5	66.7	90.6	2,066	2,280	641	505	23.9	43.0					
1963	189.2	67.8	91.7	2,139	2,333	632	503	23.4	42.3					
1964	191.8	69.3	92.9	2,284	2,459	632	505	23.4	42.6					
1965	194.2	71.1	94.5	2,436	2,578	620	503	22.9	42.6					
1966	196.5	72.9	97.2	2,605	2,680	604	503	22.3	42.4					
1967	198.6	74.4	100.0	2,751	2,751	581	494	21.4	41.6					
1968	200.6	75.9	104.2	2,946	2,827	577	497	21.2	41.8					
1969	202.6	77.9	109.8	3,130	2,851	570	494	20.9	41.7					
1970	204.8	78.6	116.3	3,358	2,887	564	492	20.7	40.9					
1971 ^{2/}	207.0	79.0	121.3	3,590	2,960	557	492	20.4	41.1					

^{1/} Includes available data for Alaska and Hawaii beginning 1960.
^{2/} Estimated.

Source: Dairy Situation, November 1971, Economic Research Service, USDA.

Table 8.---Per capita civilian disappearance of all milk and selected dairy products, United States, 1950, 1955, 1960-1971

Year	Pounds													
	Total : use : <u>1/</u>	Fluid : use : <u>2/</u>	Butter :	Ameri- : can : cheese :	Other : cottage : cheese :	Evap. & : cond. : milk :	Dry : whole : milk :	Nonfat : dry : milk :	Ice : cream :	Ice : milk :				
1950	740	304	10.7	5.5	2.2	3.1	20.1	0.3	3.7	17.7	1.2			
1955	706	320	9.0	5.4	2.5	3.9	16.2	0.3	5.5	18.6	2.9			
1960	653	309	7.5	5.4	2.9	4.8	13.7	0.3	6.2	18.8	4.5			
1961	641	303	7.4	5.7	2.9	4.6	13.3	0.3	6.2	18.5	5.0			
1962	641	302	7.3	6.1	3.1	4.6	12.5	0.3	6.1	18.4	5.6			
1963	632	304	6.9	6.1	3.1	4.6	11.6	0.3	5.8	18.5	6.0			
1964	632	304	6.9	6.2	3.2	4.7	11.4	0.3	5.9	18.8	6.3			
1965	620	306	6.4	6.2	3.4	4.7	10.7	0.3	5.6	18.8	6.6			
1966	604	305	5.7	6.2	3.6	4.7	9.7	0.3	5.9	18.4	6.8			
1967	581	298	5.5	6.4	3.7	4.5	9.0	0.3	5.6	18.1	6.9			
1968	577	299	5.7	6.6	4.0	4.7	8.9	0.2	5.8	18.6	7.2			
1969	570	297	5.4	6.7	4.2	4.8	7.9	0.2	5.8	18.3	7.5			
1970	562	292	5.3	7.1	4.4	5.1	7.1	0.2	5.3	18.0	7.9			
1971	557	290	5.1	7.4	4.8	5.2	6.8	0.2	5.5	18.0	7.7			

1/ Total civilian disappearance in milk equivalent on basis of milk fat.
2/ Fluid milk and cream in product pounds.

For fluid milk products, per capita consumption on a product weight basis has declined about 5 percent since the mid-1960's. At the same time the low-fat items have gained in share of total fluid use (table 9).

Table 9.--Sales of individual fluid milk products as a proportion of total fluid sales, selected Federal order markets, July, specified years, 1962-70

Fluid items	July				
	: 1962	: 1964	: 1966	: 1968	: 1970
	<u>Percent</u>				
Whole milk items	87.8	86.5	84.5	81.8	78.0
Skim milk items ^{1/}	7.1	7.3	6.9	7.0	7.4
Low-fat milk items ^{2/}	2.3	3.8	6.4	8.8	12.6
Cream and cream mixtures	<u>2.8</u>	<u>2.4</u>	<u>2.2</u>	<u>2.4</u>	<u>2.0</u>
Total fluid milk and cream	100.0	100.0	100.0	100.0	100.0

^{1/} Includes skim milk, buttermilk, flavored milk drinks, and small quantities of yogurt and cultured specialties.

^{2/} 2-percent milk.

Source: Dairy Situation, July 1971, Economic Research Service, USDA.

Total civilian disappearance in milk equivalent grew during the 1950's and early 1960's to a peak of 120 billion pounds in 1964 (table 10). By 1967, annual volume had declined to less than 114 billion pounds and has since continued at about that level. While total volume of cheese and ice milk made substantial increases, total use of butter and evaporated and condensed milk declined. Changes in use of other major dairy products have followed about the same pattern as for total civilian disappearance of milk.

These changes in no small extent reflect changes in consumer tastes and preferences. For milk fat, changes in preference have been influenced by a general trend toward less animal fat in the diet and by the development of acceptable substitutes such as margarine for butter and nondairy coffee whiteners for cream.

Table 10.--Total civilian disappearance of selected dairy products, United States, 1950, 1955, and 1960-71

Year	:Total :Fluid:		:American :cheese :	:Other :cheese :	:Cottage :cheese :	:Evap. & :Dry :		:Nonfat :dry :milk :	:Ice :cream :	:Ice :milk :	
	: use :	: use : 2/ :				: cond. :milk :	: whole :milk :				
	1/	2/									
Billion lbs.											
1950	111	41	1,614	823	332	462	3,020	42	549	2,659	165
1955	115	48	1,461	870	411	640	2,626	40	889	3,019	495
1960	116	53	1,333	965	524	858	2,447	55	1,106	3,360	798
1961	116	53	1,335	1,027	517	841	2,399	50	1,128	3,355	902
1962	118	54	1,341	1,113	563	853	2,289	61	1,119	3,379	1,034
1963	118	55	1,279	1,142	575	868	2,170	48	1,087	3,446	1,165
1964	120	56	1,297	1,168	593	897	2,157	61	1,119	3,547	1,199
1965	119	58	1,232	1,178	648	901	2,040	59	1,069	3,634	1,270
1966	117	58	1,098	1,200	689	894	1,882	64	1,132	3,606	1,320
1967	113	58	1,076	1,249	720	897	1,757	51	1,085	3,578	1,368
1968	114	58	1,115	1,296	787	928	1,745	46	1,140	3,711	1,429
1969	114	59	1,079	1,339	843	973	1,565	44	1,148	3,674	1,515
1970	113	58	1,061	1,434	886	1,044	1,435	43	1,075	3,662	1,604
1971	114	59	1,031	1,518	976	1,075	1,386	40	1,122	3,707	1,580

1/ Total civilian disappearance in milk equivalent on basis of milk fat.

2/ Fluid milk and cream in product pounds.

In past decades a large portion of nonfat solids were fed to livestock, yet appeared to be in the food supply when consumption of butter was reported on a milk equivalent, fat-solids basis. Today nearly all milk solids produced are delivered to plants for processing and used in the human food supply.

Changes in Foreign Trade

In 1971, imports equivalent to 1.3 billion pounds of milk (fat solids basis) were below those for 1970 (table 11). This decline is attributable to new import quotas during 1971, some scheduling delays among quota holders, the West Coast dock strike, and the sharp drop in world supplies resulting in increases in world prices of dairy products. The latter was particularly significant.

Table 11.--Imports, exports, and shipments of dairy products, United States, 1960-71^{1/}

Year	Imports		Exports		Shipments ^{2/}	
	Quan-	Percent of:	Quan-	Percent of:	Quan-	Percent of:
	tity	production:	tity	production:	tity	production
	Mil. lb.	Percent	Mil. lb.	Percent	Mil. lb.	Percent
1960	604	0.5	776	0.6	253	0.2
1961	760	.6	655	.5	277	.2
1962	795	.6	1,287	1.0	431	.3
1963	915	.7	5,036	4.0	457	.4
1964	830	.7	6,872	5.4	582	.5
1965	923	.7	1,836	1.5	522	.4
1966	2,791	2.3	778	.6	430	.4
1967	2,908	2.4	363	.3	461	.4
1968	1,780	1.5	1,185	1.0	586	.5
1969	1,600	1.4	921	.8	498	.4
1970	1,874	1.6	438	.4	548	.5
1971 ^{3/}	1,342	1.1	2,480	2.1	568	.5

^{1/} Milk equivalent, fat solids basis.

^{2/} To U.S. territories.

^{3/} Preliminary.

Source: Dairy Situation, May 1972, Economic Research Service, USDA.

U. S. exports of milk fat, largely in butter and condensed milk, were up sharply (table 12). The big increase in butter exports did not begin until May 1971. By late December, butter export sales had reached about 120 million pounds and were expected to expand to 150-170 million pounds by the end of the fiscal year, June 1972. The unusual surge in exports resulted from two developments: (1) A drought in New Zealand that reduced its milk production and butter supplies and (2) dairy policies in a number of countries, particularly the European Economic Community countries, were more successful than was anticipated in stabilizing milk production and curtailing the buildup of excess supplies.

About the most the U.S. dairy industry can hope for is to influence development of a national policy that would maintain the volume of dairy imports at about the volume that can be exported so that the effect of foreign trade on domestic prices will be negligible. This will require a well-organized and dedicated group of dairy producers.

Some believe there is opportunity for cooperatives to organize on a broad scale to take a more active role in the export and import trade. Also, it is possible that merchandising efforts abroad may be appropriate. However, dairy farmers may find it advisable to strive for production at levels which the U.S. market will take at satisfactory prices. Dollar markets show no great void into which U.S. dairy surpluses can be pushed.

Changes in Plant Numbers and Size

The trend during recent years has been toward fewer but larger and more specialized milk processing plants. Between 1948 and 1970 the number of plants making butter declined 81 percent, from 3,244 to 619 (table 13). The number of plants processing other dairy products declined by one-half to two-thirds. The largest decline was in the number of relatively small plants operated by "producer-distributor" in processing and packaging fluid milk.

During the 1948-70 period, the average output per plant more than doubled for all manufactured product classifications except evaporated milk. The average output for evaporated milk plants declined after 1963.

From the viewpoint of dairy processing establishments classified according to their primary activity, the trend is downward in number but upward in total volume of shipments except for creamery butter establishments (table 14). Between 1958 and 1967, the total number of dairy processing establishments declined 37 percent. However, the change in number of establishments with 20 or more employees varied by dairy in-

Table 12.--Exports of dairy products, United States, 1960-71

Year and month	Butter : 1/	Cheese	Evap- orated milk	Con- densed milk	Dry whole milk	Nonfat dry milk	Infant and dietetic foods	Milk equiv- alent 2/
Million pounds								
1960	8.0	9.1	101.5	41.9	28.1	446.7	16.3	776
1961	6.7	8.8	92.3	47.3	17.5	734.2	19.1	655
1962	34.9	19.1	66.3	47.7	13.4	873.6	16.0	1,287
1963	192.5	33.6	65.5	56.6	29.8	1,119.2	18.0	5,036
1964	296.5	9.1	37.3	62.8	12.3	1,310.9	18.6	6,872
1965	65.7	6.8	24.7	65.8	18.6	863.4	16.0	1,836
1966	13.7	6.0	38.4	94.3	15.6	387.7	16.5	778
1967	2.9	6.4	33.8	29.2	11.9	409.0	17.2	363
1968	32.2	6.8	32.7	42.5	17.2	397.1	18.5	1,185
1969	20.8	7.2	37.1	52.2	13.9	329.4	16.9	921
1970	1.9	6.7	33.3	16.4	12.6	416.1	18.6	438
1971	93.8	6.5	32.7	35.2	21.9	357.6	25.5	2,480

1/ Includes butter equivalent of butteroil, ghee, and anhydrous milkfat.

2/ Includes milk equivalent of products not shown separately.

Source: Dairy Situation, March 1972, Economic Research Service, USDA.

Table 13.--Number of plants processing dairy products and average volume processed per plant, United States, selected years, 1948-70

Product	Processing plants :					Average output per plant					Change : 1948 : to : 1970 :
	No.	No.	No.	No.	No.	Thou. lb.	Thou. lb.	Thou. lb.	Thou. lb.	Thou. lb.	
Butter	3,224	2,062	1,321	619	-81	375	685	1,075	1,836	+390	
American cheese	1,749	1,194	924	776	-56	486	853	1,200	1,837	+278	
All cheese	2,295	1,603	1,282	963	-58	479	878	1,273	2,288	+378	
Evaporated milk ^{1/}	137	85	63	42	-69	24,693	28,796	30,116	28,998	+17	
Ice cream ^{2/}	3/3,536	3,395	2,476	1,627	4/-54	--	5/179	5/275	5/469	--	
Creamed cottage cheese	1,240	1,654	1,086	584	-53	201	420	732	1,675	+733	
Nonfat dry milk	435	456	406	219	-50	1,567	3,679	5,164	6,588	+320	
Total manufacturing plants	3/9,739	--	6/6,134	3,724	4/-62	3/7/5,622	--	6/7/10,281	7/16,164	4/+188	
Fluid milk processing plants:											
Handlers	8,392	--	8/3,920	--	9/-53	--	--	--	--	--	
Producer-distributors	11,319	--	8/1,677	--	9/-85	--	--	--	--	--	
Total	19,711		8/5,597		9/-72						

1/ Unskimmed case goods. 2/ Regular plants, excluding counter freezers; total plants were 14,241 in 1948 and 11,218 in 1968. 3/ 1944 data. 4/ 1944 to 1970. 5/ In gallons. 6/ 1961 data. 7/ Whole milk equivalent. 8/ January 1965 data. 9/ 1948 to January 1965.

Table 14.--Number of dairy processing establishments and value of shipments, United States, 1958, 1963, and 1967

Industry	Total number of establishments		: Number of establishments : with 20 or more employees		: Change : 1958-67		: Change : 1958-67		: Value of shipments			
	1958	1963	1958	1963	1958	1963	1958	1963	1958	1963		
	No.	No.	No.	No.	Pct.	Pct.	M. DoL.	M. DoL.	M. DoL.	M. DoL.		
Fluid milk ^{1/}	5,828	4,619	3,481	2,239	1,948	1,636	1,636	1,948	6,412	7,026	7,826	+22
Creamery butter	1,058	766	540	228	178	138	138	178	1,024	989	959	-6
Natural and process cheese	1,310	1,138	1,026	195	206	238	238	206	874	1,171	1,708	+95
Condensed and evaporated milk ^{2/}	313	281	291	202	166	169	169	166	821	938	1,263	+54
Ice cream and frozen desserts	1,390	1,081	850	458	387	325	325	387	952	1,076	1,059	+11
Total dairy products	9,899	7,885	6,188	3,322	2,885	2,506	2,506	2,885	3/	3/	3/	3/

^{1/} Includes cottage cheese.

^{2/} Includes dry milk products.

^{3/} If totaled would include duplications.

Source: 1967 Census of Manufacturers, U. S. Department of Commerce, Bureau of the Census.

dustries. For example, in the natural and process cheese industry, the number of establishments with 20 or more employees increased 22 percent while in creamery butter industry they declined 39 percent. Also, the number of condensed and evaporated milk establishments (includes dry milk products) with 20 or more employees declined 16 percent while the total number declined only 7 percent. In all other industries the total number of establishments declined more rapidly than the number with 20 or more employees.

Changes in Milk Processor and Buyer Concentration

The average sales of the 4 and 8 largest dairy companies and all dairy companies in each of the 5 major dairy industries as identified by Bureau of the Census are shown in table 15. Also included are the average sales for all companies computed using 1966 sales, except for creamery butter, and 1963 data on number of companies. Since the number of companies is declining this understates the average sales for all companies, but we do not believe the amount to be significant. The greatest processor concentration was the fluid milk industry where the ratio between dollar sales for the average company and the 4 and 8 largest were 1 to 232 and 1 to 151, respectively. While the condensed and evaporated milk industry had the smallest ratio between average and large companies, the average company had sales 3 to 5 times larger than the average for the other dairy industries.

Table 15.--Average value of shipments by each of the 4 and 8 largest dairy companies in major dairy industries compared with average for all dairy companies, United States, 1966

Industry	: Average : sales : 4 largest	: Average : sales : 8 largest	: Average : sales : all companies
	<u>Dollars</u>		
Creamery butter	<u>1/</u> 27,191,368	<u>1/</u> 23,483,454	<u>1/</u> 1,363,830
Natural and process cheese	170,747,500	98,955,938	<u>2/</u> 1,580,703
Condensed and evaporated milk	123,696,225	81,089,748	<u>2/</u> 6,583,964
Ice cream and frozen desserts	94,233,398	62,822,265	<u>2/</u> 1,267,728
Fluid milk	427,509,165	278,810,325	<u>2/</u> 1,844,899

1/ Based on 1963 data.

2/ Based on 1963 data for number of companies and 1966 data for sales.

Source: "Value of Shipment Concentration Ratios by Industry," M66 (AS), U.S. Department of Commerce, Bureau of the Census, 1966.

Table 16 shows the total value of shipments for selected products and the market share of each product handled by the companies with largest shipments of the product. Generally the 4 and 8 largest companies handling the various products appear to be losing market shares. Exceptions were in ice cream and ices where a small gain was made, and in dry milk products and cottage cheese where they were maintaining position. At the same time the 50 largest companies were generally gaining market shares. Exceptions were in condensed and evaporated milk, dry milk products, and ice cream mix and ice milk mix.

Only a limited significance can be attached to the fact that the concentration ratios appear to have declined. The industries are grouped together in such a way as to obscure most of the subtle relationships. Studies tend to show that the significant happenings were not so much changes in shares of the 4 and 8 largest but, instead, that the companies in between the largest 8 and the largest 50 have become larger and better able to affect the conditions of competition.

While concentration in manufacturing of dairy products is important, it is not the only means of gaining market power. In fact, we believe that concentration among intermediate handlers is of greater importance among dairy industries than is concentration among actual manufacturers.

The following discussion will examine marketing considerations of various dairy industries and food chains.

Butter Industry

Most butter is made as a joint product in milk drying. Butter and powder are major forms of disposal for surplus milk in fluid milk marketing throughout the Nation.

Market shares among butter manufacturing firms are low. In 1963, the four largest companies accounted for only 8 percent and the 20 largest only 25 percent of total butter shipments. While operating as separate butter manufacturing firms, many of the buttermaking cooperatives have attained a degree of horizontal integration through membership in federated cooperative sales organizations. About one-half of the cooperative butter manufacturing firms are members of **sales** agencies.

Market shares of leading intermediate handlers (cooperative sales agencies, specialized jobber-wholesalers, meat packers, large dairy companies, and food chains) have increased in recent years. In 1965, the market share of the 4 largest buyers was 38 percent; the 8 largest, 50 percent; and the 18 largest, 62 percent.

Table 16.--Percent of value of shipments of each class of selected products accounted for by the largest companies: 1963 compared with 1958 and 1954

Class of products and year	Value of shipments				
	Total	Percent accounted for by--			
		4 largest companies	8 largest companies	20 largest companies	50 largest companies
	\$1,000				
Creamery butter:					
1954.....	858,525	14	19	28	(NA)
1958.....	802,316	11	15	24	37
1963.....	820,445	8	14	25	40
Condensed and evaporated milk:					
1958.....	977,939	38	48	58	72
1963.....	1,104,479	33	42	55	70
Dry milk products:					
1958.....	421,145	22	33	49	69
1963.....	504,424	22	30	47	65
Canned milk (shipped in consumer type packages):					
1954.....	341,167	79	86	97	(NA)
1958.....	352,083	78	85	97	99
1963.....	363,045	66	78	93	100
Ice cream mix & ice milk mix:					
1954.....	119,486	24	33	46	(NA)
1958.....	118,475	23	35	56	77
1963.....	157,776	17	26	45	69
Ice cream and ices:					
1954.....	954,337	33	41	52	(NA)
1958.....	1,137,704	35	44	54	62
1963.....	1,210,027	34	43	57	65
Fluid milk:					
1958.....	5,577,006	23	29	37	44
1963.....	6,016,599	22	29	38	46
Bottled milk and cream:					
1958.....	4,110,344	26	32	40	47
1963.....	4,285,066	25	32	42	50
Cottage cheese (including baker's cheese, pot cheese, and farmers cheese):					
1958.....	185,266	32	44	58	70
1963.....	189,149	32	45	58	72

Source: "Value of Shipment Concentration Ratios by Industry" M66 (AS), U.S. Department of Commerce, Bureau of the Census, 1963.

With the exception of vertically integrated firms, product differentiation at the manufacturing level is not important. Also, the importance of intermediate handlers' brands has been declining due to the growing sales of private-label (retailer) brands of butter.

Cheese Industry

Cheese production is dispersed among many factories of which a large number are small family-type operations. Yet most of the cheese output is channeled through a few intermediate handlers. In fact, over 70 percent of the U.S. output of American cheese is handled by four buyers (large dairy companies and meat packers). They are in a position to brand the product and benefit from development of the consumer franchise.

Demand for cheese is increasing more rapidly than for any other major dairy product. Also, economies of scale in cheesemaking are increasing. The stirred curd and other technology appear to permit sharp reductions in cost with large operations, especially in labor cost. These conditions point up opportunities in cheesemaking for regional cooperatives that can put together large quantities of milk. Such cooperatives could choose alternative courses of action such as: (1) Establish their own large-scale plants and build the consumer franchise for their cheese through expensive advertising; or (2) develop advantageous arrangements with large intermediate handlers who have well-known brands. Such arrangements include various combinations such as an agreement for the cooperative to furnish the required quantities of milk to a plant operated by the intermediate handler, or an agreement for the cooperative to make the cheese under specifications as to types, qualities, and quantities. Even joint sharing of facilities could be mutually advantageous to the cooperative and the intermediate handler. However, considerations would need to be given to legal aspects of the joint venture to assure that it did not violate antitrust legislation.

Evaporated Milk Industry

The canned milk industry has sharply declined due to reduced consumer demand. The value of shipments is highly concentrated. In 1963, the four largest companies accounted for two-thirds of total shipments and the eight largest had 78 percent.

Since margins are low and consumer demand is declining, it is unlikely that entry into the industry would be sought by other firms.

Dry Milk Industry

Since World War II, generally one-third to one-half of all powder produced has been sold to the Government under the price support program. About two-thirds of the remainder is sold directly to industrial users and food chains. The rest is sold largely through brokers or cooperative sales organizations. Efforts on the part of these cooperative sales agencies to provide price leadership appear to be only partially effective due to a lack of the necessary conditions.

Nearly 30 percent of domestic commercial sales is now in the form of instant powder for direct household use. Production of instant powder requires special equipment that few of the usual drying plants have. It can be made directly from the fluid skim or it can be made by re-processing low heat spray powder.

For practical purposes, instant powder can be viewed as a separate segment of the dry milk industry. The brand name of the packaged product sold to households appears quite important. Brand names which carry premiums are those of the big national dairy companies. The big food chains have well-established brands. The opportunity for attractive margins by dairy cooperatives is limited because of advertising cost. When the product is made and packaged for private-label sales to food chains, the expected margins are likewise low because these companies can readily obtain supplies of powder and do their own instantizing, and for other reasons.

Fluid Milk and Ice Cream Industries

Fluid milk and ice cream are viewed by the trade as separate industries, although they have many similarities. We are treating them together since any economic analysis of one has a parallel in the other. They differ from the other dairy industries in that they are what might be called "distributive trades." There is no wholesale market into which these products may be sold but instead they must be distributed directly to household consumers, institutions, retail stores, and the like.

The size of the market is prescribed by the perishable characteristics of the product and by the geographic area in which the firm can develop and maintain personal relationships with customers. Retail prices vary more from market to market than do retail prices for other dairy products.

Since the early 1950's dealers have sold increasing amounts of fluid milk and ice cream to supermarkets usually grouped into chains of one type or another. The economic significance of this change is that the dealers now face a few large buyers in contrast to many small independent buyers a few years ago.

The number of fluid milk and ice cream dealers has declined rapidly in the last two decades and the technology of manufacture and distribution is now such that the decline in numbers may be even greater in the future.

Generally, when a fluid milk or ice cream firm acquires the operations of another, it does so for the sales outlet. When a manufacturing firm acquires the operations of another, it does so for the supply from farmer patrons in order to add volume and so reduce average manufacturing costs. In either type of acquisition, the acquiring firm seldom is particularly interested in the physical facilities of the one acquired.

The organization of fluid milk and ice cream markets is generally considered to be more complex than markets for the hard products. This is because markets for fluid milk and ice cream are local as well as regional and in some respects even national. The competitors in these markets may be viewed in terms of who operates in the markets and how much market power they have. Competitive behavior of dealers is usually related to size and market shares.

Available statistics show several important relationships between size of market and market share of handlers, for example:

1. The larger the market the smaller the share of total sales controlled by the largest four firms. Market shares of the four largest firms in Federal milk order markets during 1964 ranged from 52 percent to 89 percent within markets arranged by size.
2. The larger the market the larger the number of both small and large dealers in the market.
3. Market shares of the largest firms have grown constantly since 1950.
4. In the larger markets the four largest dealers are most likely to be national or regional firms.
5. National or regional firms nearly always are the ones operating establishments with monthly sales of over 3 million pounds.

Food Chain Buyers

Food chains include corporate chains, voluntary buying groups, and cooperative chains. The important thing is that most grocery buying is now done by large central organizations instead of small individual stores, as was the custom before World War II. Also milk and ice cream are sold largely through food chains. Only a decade or so ago most milk was sold directly to households and ice cream was distributed through locally operated drug stores.

By 1969 home-delivered milk in Federal order markets had declined to 19 percent of total fluid milk sales (table 17). The use of paper and plastic containers had risen to 87 percent of total. The trend was toward gallon containers which increased by two-thirds between 1963 and 1969. The changes in type and size of containers favor distribution through food chains.

Food chains are important to dairy cooperatives. They are substantially in the business of processing and manufacturing dairy products and as such are buyers of raw milk. They furnish outlets for advertised brands of dairy products and products packed with their private labels. Thus, cooperatives must use them as an outlet for packaged products. Frequently food chains have more effect on dairy prices at all levels than the largest dairy manufacturers and handlers.

Examination of statistics regarding food chains reveals:

1. Among 147 food chains, 14 percent manufactured their own ice cream; 10 percent processed their own homogenized milk; and 23 percent manufactured their own bulk natural cheese. Cottage cheese, butter, and evaporated milk were also processed by some.
2. Large food chains, in terms of annual sales, were more likely to manufacture packaged dairy products than the smaller food chains.
3. The three largest food chains were engaged in fluid milk and ice cream operations.
4. With the exception of butter and natural cheese, dairy products shipped by the 40 largest food chains increased greatly in value between 1958 and 1963.
5. The proportion of food chains of various types handling private labels may be as high as 70 percent.
6. Private labels as a percentage of total fluid milk sales by food chains have amounted to 40 to 70 percent in recent studies.
7. While food chains operating plants package less than 10 percent of all fluid milk, their proportion of the total is growing rapidly.

The significance of the trends toward milk processing and private label handling by food chains is suggested by the reasons they gave the National Food Commission for these operations. These are:

1. State milk control--by processing and distributing through their retail stores they were able to retain a built-in margin.

Table 17.--Proportion of fluid milk sales, by type and size of container and distribution method, selected Federal order markets, November, 1963-69

Item	1963	1964	1965	1966	1967	1969
	<u>Number</u>					
Federal order markets	68	67	68	68	71	65
Distribution method:						
Wholesale	70	72	72	75	77	81
Home-delivered	$\frac{30}{100}$	$\frac{28}{100}$	$\frac{28}{100}$	$\frac{25}{100}$	$\frac{23}{100}$	$\frac{19}{100}$
Total						
Type of container:						
Glass	31	30	28	24	20	11
Paper	64	64	66	68	71	77
Plastic	$\frac{1}{100}$	3	4	6	7	11
Other ^{2/}	$\frac{5}{100}$	$\frac{3}{100}$	$\frac{2}{100}$	$\frac{2}{100}$	$\frac{2}{100}$	$\frac{1}{100}$
Total						
Size of container:						
Gallon	13	16	16	17	19	24
Half-gallon	55	53	53	52	52	49
Quart	16	13	13	11	10	8
Pint	2	2	2	2	2	2
Half-pint	9	10	10	11	11	10
Other	$\frac{3}{100}$	1	1	1	1	1
Bulk: ^{4/}						
5-10 quarts	$\frac{5}{100}$	1	1	1	1	1
Over 10 quarts	$\frac{5}{100}$	$\frac{4}{100}$	$\frac{4}{100}$	$\frac{5}{100}$	$\frac{4}{100}$	$\frac{5}{100}$
Total						

1/ Not available. 2/ Metal cans and plastic bag-in-box containers, 1963, and metal cans, 1964-69. 3/ Less than 0.5 percent. 4/ Metal cans and plastic bag-in-box containers. 5/ Included in over 10-quart size containers.

2. Quality control--difficulty in procuring sufficient products of desirable quality.
3. Better margins--they could process dairy products at costs below the prices independent suppliers charged.
4. Lower distribution costs--primarily due to paying drivers on an hourly basis rather than the usual salary plus commission for regular dealers. (During recent years dealers have obtained some cost reductions for large-volume deliveries.)
5. Greater flexibility in delivery--could commingle all perishable products by locating the dairy plant near the central warehouse.

The reasons for private labeling are:

1. Permits the development of consumer loyalty to a line exclusive to the store. Thus, store has greater flexibility in obtaining milk supplies.
2. Private label products are priced lower than advertised brands of regular dealers, thus improving the store's competitive position.
3. Greater profit from private label products due to a substantially lower price charged stores for these products.

The marked increase in processing by food chains may be the most important development in the fluid milk industry in recent years. Its competitive impact on regular dealers of all sizes is profound, partly because of the food chains' cost structure. Regular dealers have had to compete with each other for their shrinking share of the market. Profit returns among regular dealers appear lower than in the past and the attrition rate is high.

Centralization in fluid milk processing by both food chains and large dairy firms has changed the structure of fluid milk markets. This has often caused dairymen to have to ship their milk to a more distant centralized plant or find an alternative nearby outlet. Also dairymen have had to expand their cooperative marketing programs to include several metropolitan areas in an effort to maintain bargaining strength.

Some argue that the public could be better served with one or more large fluid milk processing plants in each metropolitan area rather than having plants that serve several metropolitan areas. Since raw whole milk can be transported more cheaply than packaged, reduced inter-area movement of packaged milk should help minimize overall transporting costs.

If centralization of processing and packaging of fluid milk is to develop on a metropolitan area basis, it would likely be done by dairy cooperatives. They are in a position to obtain benefits from more efficient movement of raw milk supplies. Cooperatives in many markets have demonstrated their ability to operate an efficient plant system in the disposal of surplus Grade A milk. Centralized processing by cooperatives would mean that dealers would bargain for packaged products instead of raw milk. It could help equalize distributors' costs for packaged products and improve overall marketing efficiency. However, the larger and more efficient dealers would generally oppose the cooperative's expansion into fluid milk processing and packaging.

Changes in Structure and Operations of Dairy Cooperatives

Many of the fluid milk marketing cooperatives were formed to serve dairymen shipping milk to relatively isolated markets. With the assistance of Federal milk marketing orders they developed reasonably effective marketing programs. By the late 1940's, cooperatives in some markets were able to obtain over-order prices.

Many of the earlier over-order prices occurred during tight milk supply situations. For example, handlers were somewhat responsive to raising prices up to the cost of obtaining milk from alternative sources when it appeared that a substantial amount of out-of-area milk would be needed during the short supply season. Over-order prices thus assured equal buying prices to all handlers in the market and encouraged a build-up in local supplies which would reduce future needs for outside milk. Over-order prices prior to 1956 were generally seasonal and often short lived.

During the 1950's cooperatives primarily engaged in bargaining found it necessary to handle at least part of the surplus milk in order to assure members a market for their milk. For some handlers the shift to bulk assembly had resulted in producers greatly expanding their milk supplies. Where handlers were unable to obtain the Class II price plus handling cost for unneeded milk, they often turned supplies back to the associations. As a result, the bargaining associations took steps to gain control over their full milk supply and improve their bargaining positions. For some associations this meant that they began handling producer payrolls, directing milk assembly trucks from farms to delivery points, operating supply equalization plants, and manufacturing the surplus Grade A milk.

In some of the larger markets in the Midwest where cooperatives were already manufacturing the surplus, over-order prices were obtained by unified action of the cooperatives through federated organizations.

The concept of separate fluid milk markets was shattered during the 1950 and 1960 periods by technological improvement and by the courts. Improvements in transportation, milk hauling, milk processing, and product distribution greatly increased potential benefits to large-scale handlers. The courts struck down both local and State health regulations used to isolate markets. Also, the Supreme Court held invalid certain Federal milk order provisions concerning compensatory payments that the court concluded were unneeded and tended to be barriers to free movement of milk between Federal order markets.

Some of the more aggressive cooperatives sought ways to ship milk not needed locally to more distant outlets. The increased ability to move milk created opportunities for fluid milk handlers to play one cooperative against another in an effort to obtain cheaper milk. Often the benefits gained from the direct shipment of local suppliers to out-of-area outlets proved to be of short-run benefit, as the displaced milk in the out-of-area outlets could also seek their out-of-area outlets. Such shipments could eventually lead to the initial area being partly supplied with out-of-area milk.

During the early 1960's, milk supplies increased while prices declined (table 18). The growing cost-price squeeze led to the establishment of two large regional federations in the central part of the Nation. One served dairy cooperatives east of the Mississippi River and the other served those located largely west of the Mississippi River.

Table 18.--Milk production and average prices received by farmers for milk of 3.5 percent butterfat content, United States, 1950, 1955, and 1960-71

Year	: Milk : : production : <u>Billion lbs.</u>	: Class I	: Grade A	: All milk	: Manufac- : turing
			<u>Dollars a hundredweight</u>		
1950	116.6	4.86	4.07	3.58	2.82
1955	122.9	5.18	4.30	3.80	2.92
1960	123.1	5.48	4.52	4.04	3.07
1961	125.7	5.43	4.49	4.06	3.18
1962	126.3	5.35	4.39	3.95	3.04
1963	125.2	5.31	4.38	3.98	3.06
1964	127.0	5.35	4.45	4.03	3.13
1965	124.2	5.39	4.48	4.09	3.21
1966	119.9	5.82	5.02	4.66	3.82
1967	118.8	6.20	5.28	4.87	3.91
1968	117.2	6.50	5.54	5.12	4.09
1969	116.3	6.70	5.74	5.36	4.32
1970	117.1	6.94	5.92	5.59	4.58
1971	118.6	7.12	6.07	5.71	4.71

Besides coordinating milk marketing activities, cooperatives made efforts to improve the milk pricing structure of the North Central Federal order markets. With reduced milk supplies, there was a turn-around in milk prices. Through the regional bargaining federations, cooperatives were able to obtain over-order prices for many of the markets in the Central regions.

By working together, cooperative leaders helped develop a common understanding of the marketing problems cooperatives faced in different areas. Cooperatives serving high Class I utilization markets had generally assumed responsibility for supplying market needs and manufacturing the surplus. Producers in several of the high Class I markets had established association base programs designed to discourage production of milk for manufacturing purposes; yet, they were obligated to produce more than the markets needed to assure the handlers an adequate supply.

Many cooperatives in Iowa, Minnesota, and Wisconsin were serving producers of manufacturing Grade milk who wished to shift to Grade A market. Yet, the loss of volume for manufacturing would be a burden to the manufacturing cooperative.

A reserve standby pool was established to the benefit of both the fluid milk marketing cooperatives and the manufacturing cooperatives. The fluid milk marketing cooperatives agreed to contribute to the standby pool an amount based on their Class I sales for the assurance of additional Grade A milk as needed. The manufacturing cooperatives received payment from the standby pool for maintaining their Grade A milk available for shipment to fluid markets as needed. The manufacturing cooperatives were thus able to share benefits from the Grade A markets without having to ship milk to a distant market.

For milk shipped to the fluid milk markets, the manufacturing cooperatives received additional payments to cover their handling costs and the loss from reduced manufacturing operations. When no additional supplies were needed in the fluid milk markets, the manufacturing cooperatives were able to retain their Grade A milk for manufacturing.

The turnaround in milk production during the mid-1960's created a favorable environment for the large regional bargaining federations. Other bargaining federations were established on the East Coast and in the Mountain region. Also, large food chains shifted to private label distribution and some added or expanded fluid milk packaging operations. Large fluid milk packaging and distributing firms began restructuring their plants for large-scale multimarket operations.

Fearful that the large bargaining federations in the Central regions might not be able to maintain marketing gains, a number of cooperatives began a major effort to form consolidated organizations in their respective areas. This merger activity was initially concentrated in the South and Southwest and expanded to the North.

Although the emerging large centralized cooperatives primarily market Grade A milk, they have emphasized a total market concept and have solicited participation by manufacturing cooperatives. Where manufacturing cooperatives have experienced benefits of unified marketing, as in the operation of standby pool plants, the response has generally been favorable. Many other manufacturing cooperatives face a growing cost-price squeeze and a declining volume of manufacturing grade milk. By merging with one of the large centralized organizations, members gain potential entry to fluid milk markets. Also, in a combined organization, unneeded and obsolete plant facilities can be restructured into a system of modern, efficient plants with the benefits and burdens shared by all.

Table 19 shows the average pay price and margins for selected small dairy manufacturing cooperatives in Minnesota and Wisconsin. While the average pay price for the Minnesota cooperatives was equal to the average for the State, their average margin of less than 1 cent a hundredweight did not provide adequate capital to maintain facilities and revolve members' investments. Although the Wisconsin cooperatives had average margins of 9 cents a hundredweight, their average pay price was 5 cents a hundredweight less than the State average. The higher prices in Wisconsin compared with Minnesota may be partly accounted for by a higher percentage of milk assembled in bulk. Also, Wisconsin plants utilized a higher percentage of their milk in making cheese which provided higher returns than production of butter and powder.

Table 19.--Average price paid for manufacturing grade milk, selected cooperatives and all plants and dealers, Minnesota and Wisconsin, 1970

Item	:	Minnesota	:	Wisconsin
Selected dairy cooperatives ^{1/}				
Number		37		14
Average annual volume in million lbs.		12.2		13.1
Average producer price ^{2/}		\$4.560		\$4.678
Average margin (dairy operations)		\$0.008		\$0.091
State average producer price ^{2/}		\$4.56		\$4.73

^{1/} A sample of cooperatives receiving less than 25 million pounds of milk a year, all manufacturing grade, fiscal year ending Dec. 31, 1970.

^{2/} Dollars a hundredweight, adjusted to 3.5 percent butterfat using 8 cents a point butterfat.

By 1971, a large portion of the milk produced in the Central regions was being marketed through six cooperatives, four of which were formed during the late 1960's.

In December 1970, 86 percent of the producers shipping milk to Federal order markets were members of cooperatives. In six of the Federal order regions more than 90 percent of the producers were members of cooperatives. Memberships by regions were as follows:

<u>Federal order region</u>	<u>Cooperative membership</u> <u>Percent</u>
New England	95
Middle Atlantic	72
South Atlantic	99
East North Central	89
West North Central	95
East South Central	95
West South Central	92
Mountain	97
Pacific	72
All regions	86

For cooperatives to negotiate over-order prices with handlers, it is generally necessary for a high percentage of the market supply to be represented by one cooperative, either a centralized organization or a federation. Over-order prices expanded from 4 percent of the markets in 1956 to 65 percent in 1970. They have occurred largely in the South and Central regions. In 1971, over-order payments were made in 35 of the 46 markets (76 percent) stretching from Georgia to the Texas Panhandle and from the Gulf to Canada.

With increased distribution of private-label milk through food chains, milk processing firms have cut back on the amounts spent to promote and advertise. Food chains generally view milk as one of many items handled and have not been willing to give it special advertising. Thus, farmers find they can no longer depend on milk processors and distributors to adequately advertise and promote dairy products. To meet this challenge, dairymen have developed new approaches to the problem and have greatly increased their expenditures for advertising, promotion, nutrition education, and research and development. United Dairy Industry Association was established to fund and coordinate activities of American Dairy Association, National Dairy Council, and Dairy Research, Inc.

BENEFITS OF MERGER

For years dairymen have benefited from mergers of their cooperatives. Merger is used here in a broad sense to include the various methods of unification such as federation, acquisition, merger, and consolidation. The trend, however, is toward large centralized cooperatives. This suggests the desirability of cooperatives examining opportunities for further merger including the development of a large centralized association to serve all dairymen.

Further merger, for example, might enable cooperatives to benefit from increased bargaining strength, economies in operating efficiency and reductions in other costs. While this report does not make a detailed analysis of various benefits, sufficient data have been assembled, when combined with current dairy industry observations, to indicate the nature and to some degree the extent of these savings and other benefits.

As a background for examining potential benefits from further merger of the Nation's dairy cooperatives, it will be helpful to briefly summarize some of the trends and marketing conditions in the dairy industry and outline some of the activities likely to be performed by a unified cooperative.

- The shift from can to bulk assembly in Grade A milk is essentially completed and this change is well established for manufacturing Grade milk.
- The change to Grade A milk production has reached 75 percent of total supply and is increasing sharply.
- Cooperative membership among producers of Grade A milk is estimated to be above 80 percent.
- Much of the field service, supply management, and disposal of surplus Grade A milk (volume not needed for fluid use and related products) is done by cooperatives.
- In disposal of surplus Grade A milk, cooperatives have concentrated their efforts in areas where plants can be automated and the products are storable such as butter and powder and to a lesser extent cheese. Plant margins on these products are generally low.
- With the growing demand for cheese and improved cheese prices, cooperatives are believed to be increasing their share of cheese production.

- Cooperatives package only about 10 percent of fluid milk products and do not appear to be increasing their share of total production.
- Food chains are distributing increasing amounts of dairy products packaged under their own labels.
- Although food chains package less than 10 percent of the fluid milk products they distribute, the amount is increasing rapidly.
- A growing number of fluid milk plants are distributing milk to several metropolitan areas. As a result, fluid milk marketing is becoming regional with some national characteristics.
- Advertising, promotion, and development of new dairy products is increasingly being left to dairy farmers.
- Pricing milk on a classified basis according to use continues to be an effective means of providing market stability at reasonable price levels and to be in the public interest. Government regulations are necessary to assure participation of all handlers and producers in classified pricing and pooling systems. Otherwise handlers with a high Class I utilization could obtain milk supplies from independent producers at a flat price to their mutual advantage but this would undermine the classified pricing system.
- In its effort to maximize returns to members for their milk, a unified cooperative would have greater opportunity and increased responsibility for developing a most efficient marketing program. We would expect it to handle those marketing services that could be best performed by the cooperative and leave to others those services that they could best perform.
- Cooperatives are the only existing organizations in a position to develop and manage a least-cost milk-hauling program. Although many cooperatives regularly designate the delivery point for haulers, they have not generally participated in laying out milk assembly routes except for the relatively few served by their own trucks. Decisions on which contract hauler picks up a farmer's milk have been left largely to the farmers and haulers.
- Both a reduction in the number of plants and the number of days they operate a week tends to increase potential benefits available to cooperatives for restructuring milk-assembly routes and directing milk movement on a least-cost hauling basis.

- Shifts in milk supplies between outlets raises problems of how the resulting changes in hauling costs would be shared among producers and how haulers would be paid. For years the dairy industry has accepted the pooling of Grade A milk so that each producer received a blend-price reflecting his appropriate share of the higher classes of utilization without regard to how his milk was actually used. It would seem that producers would stand to benefit from the implementation of a milk hauling pool whereby each producer paid into the pool amounts based on a system of rates that reflected his share of the area's overall milk hauling costs without regard to the actual hauling of his milk. Each hauler could be paid from the pool according to the hauling services he performed rather than being paid the milk-hauling deductions made from the producers on his routes.
- A system of milk-hauling rates that would reflect each producer's share of the overall costs for a marketing area (such as a Federal order milk marketing area) could be determined as follows: (1) Establish a basic schedule of milk-hauling rates reflecting farm-to-plant hauling costs for different distances; (2) determine the volume of milk supplies located nearest each fluid milk outlet; (3) using supplies nearest each outlet and milk utilization at the outlet, determine which outlets would have surplus above the average for the total marketing area and which outlets would need additional supplies; (4) estimate the cost of transporting the above average amounts of surplus to the nearest outlet needing additional supplies and determine a charge in addition to basic rate to cover cost; (5) assign producers to the outlet reflecting lowest hauling costs including the basic rate and surplus hauling charge. Although we would expect producers to be charged amounts that would permit allocation of surplus milk supplies equally among outlets, the actual hauling would be less because much of the surplus would be manufactured in plants near the production area. Amounts not paid to haulers could be returned pro rata to producers.
- A unified cooperative would be in a position to effectively operate a pooled milk hauling program since this would complement the field service, quality inspections, and other producer-related work already being performed.
- Unless producers fully understand and support the pooled milk hauling program, the cooperative could face difficulties. For example, in areas where milk supplies are greater than the local needs, producers may seek to market their milk independently to local handlers in an effort to avoid paying their share of costs for hauling some of the milk to more distant outlets. It is expected that the cooperative would develop a way to discourage producers from such action, or possibly seek some type of Government assistance in operating the hauling pool.

In summary, we view a unified cooperative as being uniquely able to: (1) Minimize the costs of transporting milk from farm to plants; (2) supply handlers with raw whole milk according to their needs; and (3) manufacture basic storable dairy products such as butter, powder, and cheese.

Bargaining Benefits

Potential benefits from bargaining are often more alluring and often may be achieved more quickly than gains in operating efficiency.

Included in bargaining benefits are increased milk prices obtained through over-order prices paid by handlers and through changes in Federal milk orders, State regulations, and the Government price support program. While changes in regulated milk prices and the price support level may not be bargaining in the sense of negotiations between buyer and seller, it is important that producers' views be presented to the appropriate authorities for their consideration along with the views presented by handlers and other interested parties.

Since 1965 cooperatives have made substantial gains in all areas of bargaining. Weighted average over-order prices in the Central and Southern regions have ranged from 20 cents to 46 cents a hundredweight. At the same time, the Class I price in Federal order markets has risen \$1.13 a hundredweight, and the price support level for manufacturing milk has increased \$1.69 a hundredweight.

A major part of these changes is believed to have resulted from changing supply-demand conditions. For example, milk production declined from the record high of 127 billion pounds in 1964 to 116 billion pounds in 1969, and has since increased to 118 billion pounds in 1971. Present production trends indicate that milk supplies may increase moderately for the next few years.

The bargaining strength of cooperatives is in marketing of milk for fluid use. Their strength has been based on unity among producers shipping milk to the various markets and their ability to channel supplies into manufacturing milk uses. In many markets they are able to price milk at levels approximately equal to the cost for alternative supplies while assuring farmers a market even if handlers obtained alternative supplies.

If dairymen were to fully unify their cooperatives, they would handle sufficient volume in most markets to permit them to establish a reasonable level of over-order prices. Yet, if a number of producers should choose to market their milk independently, they could undermine any over-order prices established by the cooperative. Even without the marketing threat of independent milk supplies, the cooperative is

prevented from monopolizing or restraining trade to the extent that it unduly enhances the price of milk by fear of being charged with violating the Capper-Volstead Act. If ordered to cease and desist from monopolization and restraint of trade, under the provisions of the Act, this would all but destroy the cooperative's bargaining power.

With a unified cooperative marketing program, it is possible that fluid milk marketing would more quickly take on characteristics of a national market. If the cooperative adopted pooled milk hauling as discussed earlier, the use of a uniform Class I price would simplify supply management and increase the income to dairymen.

Under the present milk pricing system, Class I prices in areas of surplus milk are generally established lower than those in metropolitan areas to encourage delivery of milk to outlets according to need. With a uniform Class I price and pooled milk hauling, dairymen would assume the responsibility of delivering milk to handlers and would share hauling costs according to their individual farm locations in relation to market outlets and the supply needs of the outlets. Handlers would be encouraged to locate plants so as to minimize their milk distributing costs rather than to seek locations for low-cost milk. Thus, both the cooperative and handlers would be encouraged to improve their efficiency in transporting milk from farm to consumers. Prices to consumers would be relatively uniform.

With a uniform Class I price of \$8 a hundredweight for milk of 3.5 percent butterfat content in all Federal order markets during the month of January 1972, instead of the prevailing prices averaging \$7.18 (weighted average), producer income would have increased \$28.8 million for the month or 50 cents a hundredweight in Federal order markets. For the entire year of 1970, with an assumed decline in Class I use of 1 percent because of the higher Class I price, we estimated that the annual increase in producer-income would have amounted to \$325 million or almost 50 cents a hundredweight for all Federal order producer milk.

Assuming that the total Class I utilization would remain relatively constant, a 10-cent-a-hundredweight increase in the Class I price would increase producer income in Federal order markets by \$61.5 million a year or about 6.1 cents a hundredweight of producer milk. However, since higher prices would tend to reduce consumption and increase milk production, the price question for a unified organization becomes one of determining what price level is in the best interest of dairymen, immediately or in the long run as they might choose. Additional milk supplies would result in increased volumes of manufactured products, especially butter, powder, and cheese. A surplus of these products would generate pressure for lower Government price supports.

Thus, if a unified organization is to gain bargaining benefits, producers must keep milk production in balance with market demands at the desired price levels.

Efficiency Benefits

This analysis on gains from increased marketing efficiency is based on the premise that a unified cooperative would supply handlers with Grade A milk for Class I products and related uses and retain the surplus Grade A and manufacturing grade milk for its own use in making butter, powder, and cheese. Major benefits would come from a more efficient milk-hauling system and from operating larger and more efficient plants.

Milk Hauling Benefits

During 1967 the Nation had 3,481 fluid milk establishments (plants). Of the 1,857 manufacturing establishments, 540 were engaged primarily in making butter; 1,026, cheese; and 291, condensed and evaporated milk including powder. Another 850 establishments primarily made ice cream and frozen desserts. Many of these plants, especially those in smaller towns, receive milk directly from farmers. Generally, the entire load is delivered to the same plant. Overlapping truck routes often gives producers considerable choice in how and where they will market their milk.

To assess hauling savings, we examined some bulk routes assumed to be typical for fluid milk markets. We concluded that potential savings could be made largely through: (1) Reduction in the milk assembly miles (route miles between farm stops), (2) possible use of larger trucks, and (3) reduced transport miles (route miles between assembly area and delivery point). The milk assembly miles are the more expensive on a route, and by picking up all milk in an area the average distance between farms could possibly be reduced 50 percent. Use of a larger truck would reduce transport route miles and lower the hundredweight cost for transport miles, waiting at plant, unloading, and clean-up. Transport miles could also be reduced by allocating milk supplies among plants according to need in a manner that would minimize hauling distances.

We estimated that savings from reducing farm assembly miles and using larger trucks would amount to 4 to 5 cents a hundredweight. For the Nation this would amount to about \$45 million a year.

We further estimated that savings gained through management of milk supplies using a least-cost system in determining delivery points would be sufficient to offset the higher cost of delivering to fewer and larger manufacturing plants.

Plant Savings

During 1970, 619 dairy plants used the equivalent of 24.5 billion pounds of milk in making 1.1 billion pounds of butter. The average plant used the butterfat from 40 million pounds of milk and produced 1.8 million pounds of butter. A large number of plants made relatively small volumes of butter.

Nonfat dry milk, spray process for human food, was made by 203 plants. Together they used 16 billion pounds of skim milk in the production of 1.4 billion pounds of powder, an average of 7 million pounds per plant. We estimate that more than half the powder was made in plants using less than 100 million pounds of milk a year.

An overall look at the geographic locations of plants making butter and those making powder indicated potential gains in efficiency from further concentration of buttermaking and milk drying. While our analysis was not adequate to determine the optimum number and location of plants, it appeared that the industry could be best served with 30 to 50 butter plants and 50 to 75 powder plants. Estimated costs of making butter and powder with these plants, compared with estimated costs with present plants and their 1970 production levels, indicated average savings of almost 15 cents a hundredweight of milk processed. Total savings for restructured butter and powder industries were estimated in the range of \$25 million to \$30 million a year.

Assuming that cooperative plants were about average in size and efficiency, a unified organization could expect a proportional share of the potential gains according to volumes of butter and powder produced.

During 1970, 963 dairy plants used 19.6 billion pounds of milk in producing 2.2 billion pounds of natural cheese. We estimate that more than 80 percent of the plants made less cheese than the average plant volume of 2.3 million pounds a year. Together these small-volume plants made almost half the total volume.

An overall look at the geographic location of cheese plants indicated that the industry could be adequately served with fewer than 200 modern plants. Estimated costs using these plants compared with estimated costs with present-sized plants indicated potential gains of about 20 cents a hundredweight of milk processed or approximately \$40 million a year.

At present cooperatives probably make less than 30 percent of the total cheese. However, with increased demand for cheese, cooperatives are expanding their production. A unified cooperative could greatly improve plant operations in the cheese industry.

Cooperatives process and package slightly less than 10 percent of all fluid milk products. Although cooperatives have combined a number of their fluid milk packaging plants during recent years, opportunities for further gains remain. Examination of operations in a few areas indicates potential savings of as much as 40 cents a hundredweight in processing and distributing costs. Even if potential benefits averaged 25 cents a hundredweight of packaged milk, savings for a fully unified cooperative would be in the range of \$12 million to \$15 million a year.

Marketing Processed Products

In a combined organization, dairymen would be able to market manufactured products more effectively than they now do through a number of separate cooperatives. By specializing in the production of butter, powder, and cheese the unified organization possibly could gain a limited amount of market power. At least distress-selling could be avoided. Sales could be centralized and product merchandising improved. Market outlets could be supplied in a manner that would minimize shipping costs.

As cooperatives might come together, they would bring various marketing arrangements and product brands. With a phased shift to a single brand the unified organization would gain through volume purchases of cartons and more efficient product handling. Also, the effectiveness of its advertising expenditures would be greatly increased. However, efforts to sell the cooperative's brand of products should not be permitted to weaken the overall sales effort. For example, if the cooperative should refuse to distribute private-label products, the results could be an overall reduction in sales.

Large food chains are increasingly distributing products under their own labels. Their need to purchase and the cooperatives' need to sell large volumes of dairy products suggests a considerable area of mutual interest. The unified cooperative could custom package products for food chains or could agree to some type of joint packaging operation.

Food chains are integrating into the processing and packaging of fluid milk and certain related products. Plants are generally located to serve several metropolitan areas. It would appear that a unified cooperative could operate plants strategically located to serve the various food chains more efficiently than they could operate separate plants to serve their own stores. Confronted with the choice of bargaining with the cooperative for raw milk supplies or for processed products, food chains might logically choose to procure products if the cooperative could demonstrate ability to deliver high quality products as needed for less than the cost to the chains for operating their own plants and distribution system.

As a step in developing a unified organization, cooperatives could combine their marketing of "hard" dairy products in a federated organization. The use of dairy sales federations have proved effective in various areas. During recent years two federated sales cooperatives have been merged into large regionals. Another sales federation has taken steps toward becoming a centralized cooperative. A number of regional cooperatives market their hard dairy products.

By combining the marketing of hard dairy products into a sales federation, dairymen could gain some of the benefits expected in this activity from a fully unified organization. For example, they could gain bargaining strength, reduce transportation costs, use staff more effectively, improve merchandising ability, make more efficient use of advertising and promotion expenditures, and reduce warehousing costs. A system would need to be developed to assure that products had a standardized quality and were available in the amounts needed. Also, a means should be provided to encourage the production at preferred plant locations.

Other Cost Savings

A unified cooperative could institute a uniform accounting system. Operating costs at each plant could be readily compared with costs at others. Problem areas could be more readily pinpointed than if the plants were operated by separate organizations. Mislocated and inefficient plants could be readily phased out or modified since the combined membership would share the burdens and benefits of appropriate changes.

Uniform office forms could be used permitting lower costs from quantity purchases or possibly the operation of cooperative printing facilities.

Accounting could be more automated. Although savings in labor costs would be partly offset by increased computer costs, records could be designed so information would be more complete and more timely than that generally prepared by separate organizations.

The large cooperative would offer a challenge to outstanding management.

With centralized purchasing, the unified organization would have greater buying power in procuring plant supplies and whatever farm supplies it might choose to sell to members. Also centralized management of supplies would permit a reduction in inventory compared with that required for separate organizations.

Centralized management of money would permit a reduction in the amount of working capital needed, and should improve the ability to borrow needed capital.

With fewer people handling money, costs of bonding employees would be reduced.

Insurance would probably be handled by a single firm permitting lower administrative costs and possibly lower rates.

We would expect field service and milk quality checks to be increased to a desired uniform level. However, there should be some gains in operating efficiency since overlapping service areas of fieldmen would be eliminated.

While the unit cost of preparing an organization magazine should be greatly reduced, we would expect savings to be largely offset by increased use of area newsletters.

DISTRIBUTION OF PROCEEDS

Earlier we discussed some of the merits of a uniform Class I price to all handlers with producers sharing hauling costs for all milk deliveries. We recognize that independent producers would tend to undermine such a pricing and pooling plan with the present system of Federal milk marketing orders. Thus we shall first discuss distribution of proceeds from a theoretical concept and then from a practical point of view.

The dairy industry has long recognized the merits of pricing milk uniformly to handlers on a classified basis according to use, and pooling returns uniformly to producers without regard to how milk from individual producers was used.

If we accept the merits of uniform class prices to all handlers, it follows that producers should accept the responsibility for all hauling costs associated with their regular milk deliveries. Milk produced near fluid market outlets requires lower hauling costs and has a higher farm value than milk more distantly located. However, if more milk is produced in an area than is needed for fluid use, then the additional milk must be used in manufacturing or must be transported to distant fluid milk outlets. Assuming that all producers in the area would share in returns based on utilization of the area's milk, benefits of nearby deliveries, and burdens of distant deliveries, then production of milk in addition to the area's fluid needs would tend to lower the farm value of milk in the area.

As a matter of fairness and equity among producers, each producer should be associated with the supply area that would provide him the highest returns after appropriate deduction for hauling. Although milk hauling deductions should reflect hauling costs to fluid milk outlets, the actual hauling done would be based on a least-cost system of milk deliveries.

We visualize a primary milk supply area for most major metropolitan areas with some secondary supply areas to reflect benefits to producers for local fluid milk deliveries. If the Class I utilization in a major supply area for St. Louis, Mo., was high enough to offer the largest net returns to certain producers located in Wisconsin, then they should be included in the St. Louis supply area. They should be paid the St. Louis area price less hauling cost, but their milk would not be hauled to St. Louis except as needed. Milk hauling savings, producer hauling deductions less hauler payments based on services performed, could be returned to producers uniformly or they could be added to the pool and included in the following month's price.

An automatic method could be established for shifting producers between major milk supply areas so that each producer received the highest price based on his farm location in relation to fluid milk outlets and their demands. While all milk supply areas would be tied together, price changes resulting from changes in demand would be greatest at the point of occurrence. That is, changes in prices would initially effect a change in the geographic supply area and tend to change the price relationship between areas. Later, production responses in the area to the change in demand could return the supply area to its original size.

Together the various supply areas would in effect form a type of common pool for the total Federal milk marketing order system with location price differentials for producers. The effect of the price location differentials would be based on the combined influence of hauling cost, demand for fluid milk, and producer supplies.

Practical market considerations prevent immediate implementation of a uniform Class I price and a milk hauling pool as here discussed. However, a unified cooperative could work toward the objective of a uniform Class I price. It could also work to combine certain Federal milk marketing orders to establish more appropriate pooling areas. In lieu of Government assistance in the operation of a milk hauling pool, the cooperative might choose to obtain a system of producer price location differentials between the basic pricing point or points and other milk delivery points. Thus, independent producers would be paid on the basis of where they delivered their milk and would be less able to undermine the cooperative's over-order pricing program in an effort to obtain preferential milk delivery points.

While a unified cooperative would likely prefer to operate its own Class I base program in an effort to keep milk production in balance with demand, some type of Government base program probably would become necessary. Otherwise its base program could be undermined by independent producers. The unified cooperative would seek recognition and treatment under the order as a combined group of producers rather than as individual producers insofar as possible. It would want to maintain a great deal of freedom in decisions on what farms' milk supplies would be used to supply the needs of the various market outlets.

Although this report has dealt with cooperative marketing of dairy products from a national point of view, many of the plans discussed could be implemented on an area basis. In fact most of the program could be implemented in the Central and Southern regions if the cooperative had strong member support.

Table 19--Added facilities--Margins 5¢ and 7¢: Pro forma income statement and repayment ability at various volume levels for first year's operation for a 300,000 bushel concrete annex costing \$215,000 and rail siding for 25 cars costing \$90,000, 10 year repayment, 1973.

Item	Margin 5¢/bu.			Margin 7¢/bu.		
	2,200	3,000	4,500	2,200	3,000	4,500
Volume handled (1,000 bu.)						
Income:						
Merchandising	\$110,000	\$150,000	\$225,000	\$154,000	\$210,000	\$315,000
Drying 1/	44,000	60,000	90,000	44,000	60,000	90,000
Other 2/	15,400	21,000	22,500	15,400	21,000	22,500
Total	169,400	231,000	337,500	213,400	291,000	427,500
Operating expenses:						
Elevator operation	82,700	88,700	96,700	82,700	88,700	96,700
Siding costs 3/	11,900	11,900	11,900	11,900	11,900	11,900
Total	94,600	100,600	108,600	94,600	100,600	108,600
Net saving (loss)	74,800	130,400	228,900	118,800	190,400	318,900
Repayment ability:						
Net savings (loss)	74,800	130,400	228,900	118,800	190,400	318,900
Add: Depreciation	10,900	10,900	10,900	10,900	10,900	10,900
Less: Cash patronage refund 4/	15,000	26,100	45,800	23,800	38,100	63,800
Available for loan repayment	70,700	115,200	194,000	105,900	163,200	266,000
Loan obligation:						
Principal-facility 5/	21,500	21,500	21,500	21,500	21,500	21,500
Principal-rail siding 5/	9,000	9,000	9,000	9,000	9,000	9,000
Class "C" stock 6/	4,500	4,500	4,500	4,500	4,500	4,500
Total	35,000	35,000	35,000	35,000	35,000	35,000
Over (under) loan	\$35,700	\$80,200	\$159,900	\$70,900	\$128,200	\$231,000

Table 16--Model Y: Margins 5¢ and 7¢: Pro forma income statement and repayment ability at various volume levels for first year's operation after constructing a 500,000-bushel concrete elevator costing \$624,000 and rail siding for 25 cars costing \$90,000, 10 year loan, 1973.

Item	Margin 5¢/bu.			Margin 7¢/bu.		
	2,200	3,000	4,500	2,200	3,000	4,500
Volume handled (1,000 bu.)						
Income:						
Merchandising	\$110,000	\$150,000	\$225,000	\$154,000	\$210,000	\$315,000
Drying 1/	44,000	60,000	90,000	44,000	60,000	90,000
Other 2/	15,400	21,000	22,500	15,400	21,000	22,500
Total	169,400	231,000	337,500	213,400	291,000	427,500
Operating expenses:						
Elevator operation	217,900	225,200	241,200	217,900	225,200	241,200
Siding costs 3/	11,900	11,900	11,900	11,900	11,900	11,900
Total	229,800	237,100	253,100	229,800	237,100	253,100
Net saving (loss)	(60,400)	(6,100)	84,400	(16,400)	53,900	174,400
Repayment ability:						
Net savings (loss)	(60,400)	(6,100)	84,400	(16,400)	53,900	174,400
Add: Depreciation	34,600	34,600	34,600	34,600	34,600	34,600
Less: Cash patronage refund 4/	---	---	18,700	---	11,000	36,700
Available for loan repayment	(25,800)	28,500	100,300	18,200	77,500	172,300
Loan obligation:						
Principal-facility 5/	62,400	62,400	62,400	62,400	62,400	62,400
Principal-rail siding 5/	9,000	9,000	9,000	9,000	9,000	9,000
Class "C" stock 6/	9,200	9,200	9,200	9,200	9,200	9,200
Total	80,600	80,600	80,600	80,600	80,600	80,600
Over (under) loan	\$(106,400)	\$(52,100)	\$ 19,700	\$(62,400)	\$(3,100)	\$ 91,700
				-----Percent-----		
I.R.R. 7/	-2.7	7.8	21.8	7.0	17.4	34.9

Table 13--Model A: Margins 5¢ and 7¢: Pro forma income statement and repayment ability at various volume levels for first year's operation after constructing a 300,000-bushel concrete elevator costing \$496,000 and rail siding for 25 cars costing \$90,000, 10 year loan, 1973.

Item	Margin 5¢/bu.			Margin 7¢/bu.		
	2,200	3,000	4,500	2,200	3,000	4,500
Volume handled (1,000 bu.)						
Income:						
Merchandising	\$110,000	\$150,000	\$225,000	\$154,000	\$210,000	\$315,000
Drying 1/	44,000	60,000	90,000	44,000	60,000	90,000
Other 2/	15,400	21,000	22,500	15,400	21,000	22,500
Total	169,400	231,000	337,500	213,400	291,000	427,500
Operating expenses:						
Elevator operation	184,300	191,600	207,600	184,300	191,600	207,600
Siding costs 3/	11,900	11,900	11,900	11,900	11,900	11,900
Total	196,200	203,500	219,500	196,200	203,500	219,500
Net saving (loss)	(26,800)	27,500	118,000	17,200	87,500	208,000
Repayment ability:						
Net savings (loss)	(26,800)	27,500	118,000	17,200	87,500	208,000
Add: Depreciation	28,100	28,100	28,100	28,100	28,100	28,100
Less: Cash patronage refund 4/	---	5,500	23,600	3,400	17,500	41,600
Available for loan repayment	1,300	50,100	122,500	41,900	98,100	194,500
Loan obligation:						
Principal-facility 5/	49,600	49,600	49,600	49,600	49,600	49,600
Principal-rail siding 5/	9,000	9,000	9,000	9,000	9,000	9,000
Class "C" stock 6/	6,800	6,800	6,800	6,800	6,800	6,800
Total	65,400	65,400	65,400	65,400	65,400	65,400
Over (under) loan	\$(64,100)	\$(15,300)	\$ 57,100	\$(23,500)	\$ 32,700	\$129,100
				-----Percent-----		
I.R.R. 7/	3.6	13.8	30.0	12.9	24.8	45.8

