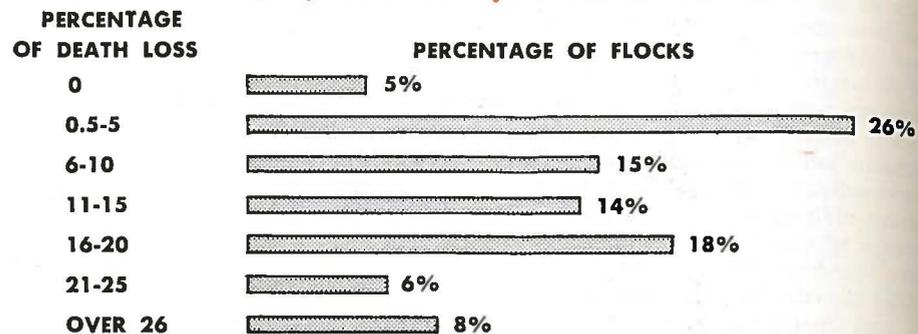


EFFECT OF NEWCASTLE DISEASE ON LAYING HENS

(The results of a survey of what happened in 100 farm flocks affected with Newcastle disease)

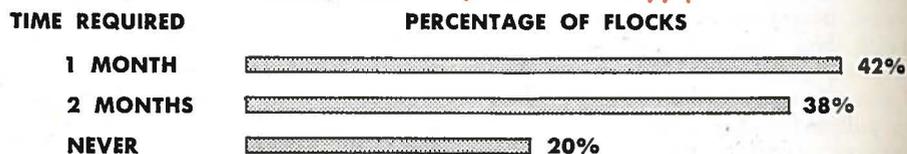
What was the range of death losses from Newcastle disease?



What effect did Newcastle disease have on egg production?



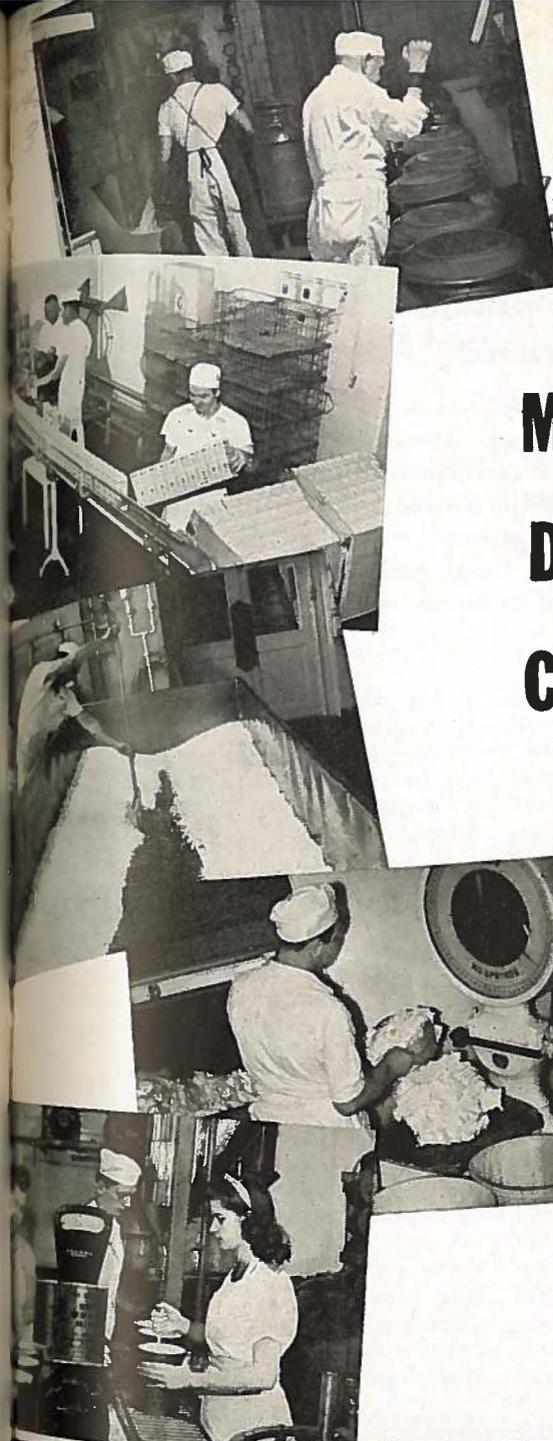
How long did it take a flock to regain normal egg production?



What effect did the disease have on shell quality such as misshapen, off-color, or soft-shelled eggs?



The survey reported here was conducted in Minnesota during 1949-50 by the School of Veterinary Medicine, University of Minnesota.



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MINNESOTA DAIRY COOPERATIVES

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 UNIVERSITY OF MINNESOTA

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Submitted for publication March 11, 1953

7M-5-53

Minnesota Dairy Cooperatives

T. W. Manning, E. Fred Koller, and O. B. Jesness¹

DAIRY cooperative managers, directors, and members are faced with problems of organization, finance, and operation. While significant progress has been made in dealing with these problems, there still can be improvement. In this analysis of some of the special problems encountered by dairy cooperatives, special attention is given to factors affecting operational and financial success or failure.

Dairying provided a cash income to Minnesota farmers of \$233 million in 1951, or 18.1 per cent of total cash income. It rose from a low of \$50 million in the depression year of 1933 to a peak of \$260 million in 1948. While milk production has been maintained at a high level, other lines have expanded and this, together with some lag in dairy prices, has resulted in a shift in the relative importance of dairying. At present dairying ranks below hogs, cattle and calves, and crops marketed as a source of cash farm income.

This shift in farm production poses some special problems for dairy cooperatives. Plants with small volumes can expand only at the expense of others; and to do this they must be more efficient. Facing fixed volumes and rising costs relative to income, dairy cooperatives must either improve efficiency, merge with others, enter new lines, or go out of business. Many dairy cooperatives have added poultry and merchandise lines. A few mergers and

a considerable number of dissolutions have occurred in the past decade.

Farmers' cooperatives have consistently increased their share of the Minnesota dairy business since early in the century. Total cooperative butter production increased from 75 million pounds in 1913 to 196 million pounds in 1949, a proportional increase from 61 per cent to 75 per cent of the state's total output.² The number of cooperatives manufacturing butter increased from 614 in 1913 to 671 in 1928, then declined to 544 in 1949. Average butter output per plant increased from 122,044 pounds in 1913 to 360,358 in 1949. These figures reveal a favorable trend in increasing volume per plant.

Cooperatives have also progressed in handling other dairy products. There has been a marked growth in whole milk and cream sales since 1940. Increases in population and the growth of markets for fluid products caused some shifts in the dairy industry. One result has been the growth of large-scale milk handling and processing associations. Dry milk production increased from 2.4 million pounds in 1921 to about 190

¹ The authors acknowledge with appreciation the excellent cooperation of the managers and other officials of dairy cooperatives in Minnesota who supplied the basic data used in this study. The assistance of C. Curtis Cable, Jr., of the Department of Agricultural Economics, University of Minnesota, who assisted in various phases of the work, is gratefully acknowledged.

² *Bulletin of Information*, 1915 through 1950, Department of Agriculture, Dairy and Food, St. Paul, Minnesota.

million pounds in 1949.³ The largest share of this growth resulted from the wartime demand for dry milk during the early 1940's. By 1949 about four-fifths of the state's dry milk was produced by cooperatives. Cooperative cheese manufacturing rose from 2.4 million pounds in 1913 to 20 million in 1949. But at the same time it decreased relative to total cheese production in Minnesota from 74 per cent to 36 per cent.⁴

SOURCE OF DATA AND SCOPE OF STUDY

The Department of Agricultural Economics made a survey of all farmers' marketing, supply, and business service cooperatives in Minnesota in 1950.⁵ The survey enumerated a total of 1,341 cooperatives, of which 538 were engaged primarily in the marketing of dairy products, 470 in marketing other farm products, 300 in handling farm supplies, and 33 in furnishing related farm business services.

The dairy cooperatives were classified on the basis of the value of products handled and services performed into three groups—butter, milk and cream, and cheese.⁶ In most cases the commodity group ranking first in value was used as the basis of classification. Where no single commodity group accounted for 40 per cent of the total, a more general classification, such as "mixed dairy," was used. In cases where the largest single commodity group comprised less than 50 per cent of total receipts while a different general type amounted to 50 per cent or more, the

³ The Minnesota Dry Milk Industry, by E. Fred Koller, Univ. of Minn. Agr. Exp. Sta. Bul. 372, p. 6.

⁴ Figures compiled by the Minnesota Department of Agriculture, Dairy and Food, and the University of Minnesota Department of Agricultural Economics.

general type was used for classification. Thus, an association whose receipts were 40 per cent from eggs, 35 per cent from milk and cream, and 25 per cent from butter was classified as a *mixed dairy association*. If the receipts were 40 per cent from butter and 60 per cent from various farm supplies, the association was classified as a *mixed farm supply association*.

Of the 538 dairy cooperatives, 434 were classified as butter, 69 as milk and cream, 16 as cheese, and 19 as mixed dairy associations. Four of these associations were large-scale regional associations, while the remaining 534 were local associations and minor federations. With the exception of the section on commodity analysis of business, and the section on regional associations, this report concerns only local associations and minor federations.

In addition to the 538 dairy associations, 20 other cooperatives handled dairy products to the extent of 10 per cent or more of their business. Eighteen of these handled primarily poultry and eggs, one farm supplies, and the other was a trucking association. Most of these associations were originally organized as dairy plants, but their operations had shifted until receipts from dairy products were a minor source of income. These associations are not included in this report.

LOCATION OF DAIRY COOPERATIVES

Dairy cooperatives were located in 84 of the 87 counties in Minnesota in 1949 (figure 1). The leading counties

⁵ The results of this survey were presented in detail in *Statistics of Farmers' Cooperatives in Minnesota, 1950*, by E. Fred Koller, T. W. Manning, and O. B. Jesness, Univ. of Minn. Agr. Exp. Sta. Bul. 412.

⁶ All dairy products except butter, cheese, buttermilk, and whey were classified under the heading of "milk and cream."

in numbers of dairy cooperatives were Stearns, 25, and Steele and Otter Tail, 19 each. In general, the location of dairy cooperatives closely followed the concentration of dairy production. How-

ever, in southeastern Minnesota the concentration of cooperatives was low relative to the concentration of milk production, while in the south-central area the opposite was true.

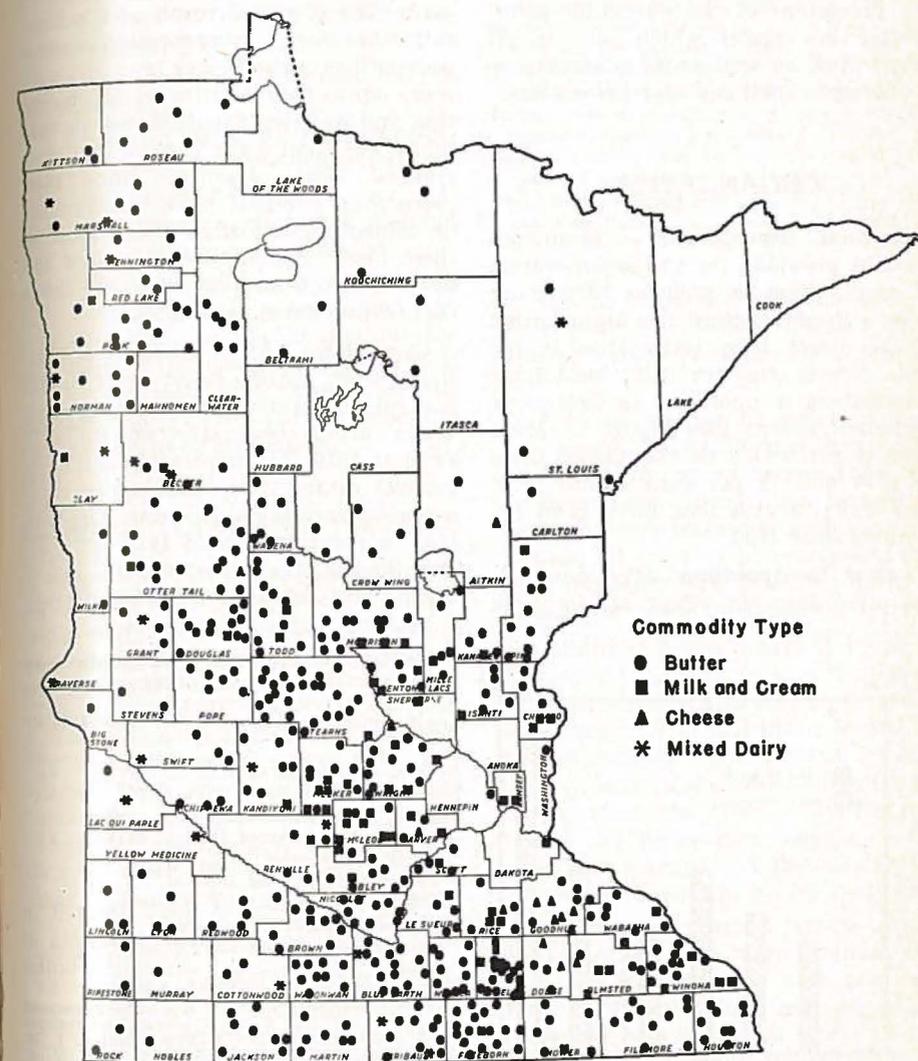


FIG. 1. Location of dairy cooperatives in Minnesota by commodity type, 1949.

Organizational Characteristics

The organizational characteristics of cooperatives are determined largely by the provisions of the particular cooperative law under which each is incorporated, as well as its adherence to cooperative methods and principles.

ORGANIZATION

Original organization—Minnesota statutes provided for the incorporation of cooperatives as early as 1870, more than a decade before the organization of the oldest dairy cooperative in the state. Nearly one-fifth of the local dairy associations in operation in 1949 were organized before 1900 (figure 2). More than 40 per cent were established prior to 1910 and 70 per cent before 1920. Few dairy associations have been organized since 1930.

Latest incorporation—Minnesota cooperative laws in effect at the time

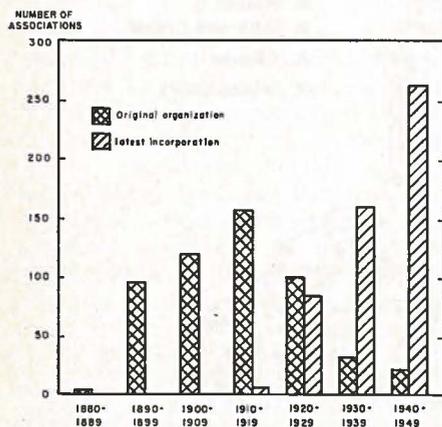


FIG. 2. Minnesota dairy cooperatives by periods of original organization and latest incorporation, 1949.

the study was made limited the length of the period of incorporation to 50 years. The principal result of this limitation has been reincorporation of older associations under newer laws and with more up-to-date articles of incorporation and by-laws. Figure 2 reveals that while less than 5 per cent of the associations were organized since 1940, more than one-half have incorporated or reincorporated since then. Most of them have amended their articles and by-laws to correspond with the latest cooperative developments.

Legal status—All of the dairy associations were incorporated, four under general corporation laws and the rest under various cooperative acts (table 1). Prior to 1919, the cooperative acts were general rather than specific regarding many organizational features. The general cooperative acts of 1919 and 1923 and the cooperative marketing act of 1923, with subsequent amendments,

Table 1. Minnesota Dairy Cooperatives by Legal Status, 1949

Legal status	Associations	
	number	per cent
General corporation laws	4	0.8
Early cooperative laws	24	4.5
General cooperative act, (chapter 382, Laws of 1919)	25	4.7
General cooperative act, as amended (chapter 326, Laws of 1923)*	445	83.3
Cooperative marketing act, as amended (chapter 264, Laws of 1923)†	13	2.4
Unknown	23	4.3
Total	534	100.0

* The amended general cooperative act is now designated as Minnesota Statutes, Sections 308.05 to 308.18, and 308.42.

† The amended cooperative marketing act is now designated as Minnesota Statutes, Sections 22.01 to 22.34.

specified these features in greater detail. Over 83 per cent of the associations in 1949 were incorporated under the general cooperative act. The major features of the general cooperative act are:

1. Each member shall be restricted to one vote in the affairs of the association.
2. Members may vote by mail but not by proxy.
3. Shares of stock shall be transferable only with the consent of the board of directors.
4. Dividends on capital stock shall not exceed 6 per cent annually.
5. Net income in excess of dividends and additions to reserves and surplus shall be distributed on the basis of patronage, and the records of the association may show the interest of patrons and members in the reserves and surplus.

COOPERATIVE CHARACTERISTICS

Most of the local dairy cooperatives operate in close accordance with the more important cooperative principles. All but five of the associations reporting followed the one-man one-vote principle (table 2). Four of these permitted voting by shares of stock held, and the other based voting on patronage volume. Only one association charged nonmember patrons more than member patrons for marketing services, another charged more for supplies, and two made some discrimination in allocating patronage refunds. The rest treated all patrons alike.

Income tax exemption—Rather general observance of cooperative principles is indicated by the fact that over four-fifths of the cooperatives had letters of exemption from the Bureau of Internal Revenue and the Minnesota State Income Tax Division (table 2). This indicates that they had met the re-

Table 2. Minnesota Dairy Cooperatives by Conformity to Certain Cooperative Specifications, 1949

Cooperative specification	Number of associations conforming	Percentage of all dairy associations reporting
Voting based on membership (one-man one-vote)	523	99.1
Equal treatment of members and nonmembers	530	99.4
Exempt from paying federal income taxes	436	82.1
Exempt from paying state income taxes	436	82.0
Articles and by-laws require all net margins to be allocated (except dividends on stock)	205	40.3

quirements of federal and state income tax laws in this respect. These specifications include, among other things, that

- (1) the association be operated on a cooperative basis;
- (2) membership be held largely by farmer-patrons;
- (3) members and nonmembers be treated equally with respect to patronage refunds;
- (4) reserves be reasonable and in conformity with law; and
- (5) dividends on stock be limited.

In addition, it was generally required that all net margins in excess of dividends on stock be allocated on the basis of patronage. The fact that one-fifth of the associations were not tax exempt does not indicate that they did not meet the specifications. There was little difference in cooperative character between the exempt and the nonexempt associations except in a very few cases.

Dividends on capital stock—About one-half of the associations limited dividends on capital stock to 6 per cent (table 3). Fourteen per cent allowed a maximum of 8 per cent, while 15 per cent had no provisions for paying dividends. Nearly one-half of the associations paid no dividends in 1949. Four and 6 per cent were the most common rates for those which paid dividends.

Table 3. Minnesota Dairy Cooperatives by Maximum Dividend Rate Permitted and Dividend Rate Paid on Common Stock, 1949

Dividend rate	Maximum dividend rate permitted		Dividend rate paid in 1949	
	number	per cent	number	per cent
None	74	14.7	240	47.8
1	0	0.0	4	0.8
2	0	0.0	20	4.0
3	2	0.4	40	8.0
4	42	8.4	79	15.7
5	14	2.8	27	5.4
6	283	56.4	84	16.7
7	3	0.6	3	0.6
8	69	13.7	4	0.8
Unknown	15	3.0	1	0.2
Total	502	100.0	502	100.0
Nonstock	32		32	
GRAND TOTAL	534		534	

Patronage refunds—Most dairy cooperatives made payments for milk and cream on a pooling basis, paying patrons once a month or oftener. Many of them can estimate closely the amount needed for operating expenses and other purposes. They pay out currently the balance of the receipts to the patrons. In view of this, patronage refunds are less significant in dairy cooperatives than in many other types. In order to preserve their cooperative nature, amounts retained for capital purposes should be allocated to the patrons on the books of the association with a view to future repayment.

Of the 534 dairy associations, 205 allocated all additions to reserves on a patronage basis (table 2). More than one-half distributed patronage refunds in either cash or equities during each of the years 1945 through 1949 (table 4). Eighteen per cent distributed no refunds, and the rest made one to five distributions during this period. These distributions included refunds in cash, allocations to reserves, certificates of interest, stock credits, and other accounts.

Table 4. Minnesota Dairy Cooperatives by Number of Patronage Refund Distributions Made during the Period 1945-1949

Number of patronage refund distributions	Associations	
	number	per cent
None	94	17.6
1	15	2.8
2	19	3.6
3	30	5.6
4	75	14.0
5	290	54.3
Unknown	11	2.1
Total	534	100.0

MEMBERSHIP AND PATRONAGE

Total membership of the 534 local dairy cooperatives was 121,399 in 1949 and total patronage was 121,598 (table 5). Of these, 102,171 were both members and patrons. About 84 per cent of the members were patrons and 84 per cent of the patrons were members. The average numbers of members and patrons of all dairy cooperatives were 227 and 228, respectively. These averages varied widely among the different types of associations. There was an average of 36 members who were not patrons and 37 patrons who were not members for all dairy cooperatives. The largest proportions of member-nonpatrons were generally associated with associations which had declining business volumes; while the largest numbers of nonmember-patrons were among the associations which were expanding their operations.

Requirements for membership—Requirements for attaining and maintaining membership are very important in keeping control and interest in the cooperative among the patrons. Most associations provided an easy means of acquiring membership by crediting patronage refunds to nonmembers in the form of shares of stock or stock credits.

Table 5. Membership and Patronage of Minnesota Dairy Cooperatives, 1949

Commodity type	Number of associations	Total			Average per association				Proportion of		
		Members	Member-patrons	Patrons	Members	Member-patrons	Members, not patrons	Patrons	Patrons, not members	Members who were patrons	Patrons who were members
Butter	433	100,592	84,500	97,762	232	195	37	226	31	84.0	86.4
Milk and cream	66	13,089	11,118	13,706	198	168	30	208	40	84.9	81.1
Cheese	16	2,311	1,915	2,150	144	120	24	134	14	82.9	89.1
Mixed dairy	19	5,407	4,638	7,980	285	244	41	420	176	85.8	58.1
Total	534	121,399	102,171	121,598	227	191	36	228	37	84.2	84.0

Those associations having lower par values on voting stock or membership provided the most rapid access to membership. Over three-fourths had memberships or voting stock of \$10 or less per share (table 6). Less than 5 per cent had membership requirements of \$50 or more.

Table 6. Minnesota Dairy Cooperatives by Financial Requirements for Membership, 1949

Financial requirement for membership	Number of associations	Percentage of grand total
Amount of capital stock required:		
\$ 1.00	97	18.1
5.00	123	23.0
10.00	163	30.5
12.50	18	3.4
15.00	2	.4
20.00	3	.6
25.00	70	13.1
50.00	15	2.8
100.00	8	1.5
Unknown	1	.2
Total	500	93.6
Amount of membership fee required		
\$ 0.50	2	.4
1.00	20	3.7
2.00	2	.4
Total	24	4.5
Requirement unknown	2	.4
No financial requirement	8	1.5
GRAND TOTAL	534	100.0

In addition to the financial requirements, the articles or by-laws of two-thirds of the associations specified that membership could be granted only to farmers; and one-fifth further required that new members be current patrons. In practice, few associations extended membership to nonfarmers or nonpatrons. However, less than one-half promptly terminated membership when a member quit farming or ceased patronizing the association (table 7). About one-third took prompt action by retiring voting stock or membership. Failure to terminate the membership of nonpatrons may easily lead to control of cooperatives by retired farmers. Thus the goal of improving returns to patrons may be neglected in favor of in-

Table 7. Minnesota Dairy Cooperatives by Action Taken When Members Quit Farming or Patronizing the Association, 1949

Action taken when members quit farming or patronizing the association	Number of associations	Percentage of total
Retire stock or membership promptly	196	36.7
Convert stock to nonvoting equities promptly	5	.9
Terminate voting rights promptly	29	5.5
No prompt action taken	297	55.6
Unknown	7	1.3
Total	534	100.0

creasing dividends to stockholders. It may also lead to poor financing and operating practices.

The problem of nonpatron membership was not serious in most cases. Substantially all of the members were farmers in over four-fifths of the associations (table 8). This is quite significant from the standpoint of control of the affairs of the association.

Proportion of business with members—Less than two-thirds of the associations did 90 per cent or more of their

Table 8. Minnesota Dairy Cooperatives by Percentage of Members Who Were Farmers, 1949

Percentage of members who were farmers	Number of associations	Percentage of total
Less than 50	5	.9
50-59	1	.2
60-69	9	1.7
70-79	9	1.7
80-89	49	9.2
90-100	451	84.4
Unknown	10	1.9
Total	534	100.0

Financing

Dairy cooperatives, like other business ventures, require large amounts of capital to finance their various needs. Making adequate provision for these requirements is one of the most important problems of these organizations.

USES OF CAPITAL

Total assets of the 534 local dairy cooperatives averaged \$87,374 (table 10). Nearly one-half of this total, or \$40,663, consisted of fixed assets including land, buildings, and equipment. Approximately 30 per cent was represented by current assets including receivables, cash, and inventories. Another 20 per cent of total capital was invested in other cooperatives, principally the central marketing organizations through which their products were sold.

Table 9. Minnesota Dairy Cooperatives by Percentage of Total Business with Members, 1949

Percentage of total business with members	Number of associations	Percentage of total
Less than 50	11	2.1
50-59	5	.9
60-69	18	3.4
70-79	53	9.9
80-89	120	22.5
90-100	320	59.9
Unknown	7	1.3
Total	534	100.0

total business with members (table 9). A smaller proportion of business with members was often a reflection of poor membership policies. Ninety-seven per cent of the associations did 90 per cent or more of their business with farmers. This indicates that a large proportion of the business with nonmembers was with farmers who were eligible for membership. This result was often due to not crediting patronage refunds toward the purchase of voting stock. Some was undoubtedly due to inertia and restrictive membership policies.

Total capital used by individual associations ranged from a few thousand to more than one million dollars each. Almost two-thirds of the butter and cheese associations had total assets less than \$70,000 each, and one-half of them had total assets less than \$50,000 each (table 11). In comparison, only 60 per cent of the milk and cream associations

Table 10. Average Assets of Local Dairy Cooperatives in Minnesota, by Commodity Type, Fiscal Year Ended 1949*

	All associations		Commodity type							
			Butter		Milk and cream		Cheese		Mixed dairy	
	dollars	per cent	dollars	per cent	dollars	per cent	dollars	per cent	dollars	per cent
Current assets										
Cash	8,560	9.9	7,388	9.5	17,061	13.8	7,063	4.8	7,000	5.8
Government bonds	476	.5	508	.6	348	.3	375	.3	263	.2
Receivables:										
Notes receivable	88	.1	67	.1	167	.1	62	†	316	.2
Accounts receivable—general	9,640	11.0	8,069	10.3	19,515	15.8	12,750	8.6	8,526	7.0
Accounts receivable—patrons	2,079	2.4	1,855	2.4	1,924	1.6	2,188	1.5	7,632	6.3
Less: Reserve for bad debts	146	.2	125	.2	121	.1	0	0.0	842	.7
Net receivables	11,661	13.3	9,866	12.6	21,485	17.4	15,000	10.1	15,632	12.8
Inventories	4,753	5.4	4,205	5.4	5,288	4.3	9,312	6.3	11,526	9.5
Other current assets	301	.4	319	.4	288	.2	0	0.0	211	.2
TOTAL CURRENT ASSETS	25,751	29.5	22,286	28.5	44,470	36.0	31,750	21.5	34,632	28.5
Investments										
Investments in other cooperatives	17,509	20.1	16,776	21.5	21,636	17.5	19,125	12.9	18,526	15.2
Other investments	114	.1	134	.2	16	†	0	0.0	105	.1
TOTAL INVESTMENTS	17,623	20.2	16,910	21.7	21,652	17.5	19,125	12.9	18,631	15.3
Fixed assets										
Land	1,221	1.4	1,180	1.5	1,000	.8	1,187	.8	2,947	2.4
Depreciable assets:										
Building and equipment	64,393	73.7	58,961	75.4	78,636	63.7	114,062	77.0	96,895	79.7
Less: Reserve for depreciation	24,951	28.6	23,732	30.3	30,697	24.8	21,812	14.7	35,421	29.1
Net depreciable assets	39,442	45.1	35,229	45.1	47,939	38.9	92,250	62.3	61,474	50.6
TOTAL FIXED ASSETS	40,663	46.5	36,409	46.6	48,939	39.7	93,437	63.1	64,421	53.0
Other assets										
Prepaid expenses	2,884	3.3	2,414	3.1	5,485	4.4	3,688	2.5	3,895	3.2
Miscellaneous assets	453	.5	113	.1	2,909	2.4	62	†	0	0.0
TOTAL OTHER ASSETS	3,337	3.8	2,527	3.2	8,394	6.8	3,750	2.5	3,895	3.2
TOTAL ASSETS	87,374	100.0	78,132	100.0	123,455	100.0	148,062	100.0	121,579	100.0
Number of associations	534		433		66		16		19	

* For the liabilities and net worth section of the balance sheet see table 12.

† Less than 0.05 per cent.

and 21 per cent of the mixed dairy cooperatives had total assets under \$70,000.

The average capital invested in Minnesota dairy cooperatives has increased significantly since 1934. In 1934 the av-

erage total assets of a sample of 146 cooperative creameries was \$26,229.⁷ In comparison, the average capital of 433

⁷ E. Fred Koller and O. B. Jesness, *Organization and Operation of Minnesota Cooperative Creameries*, University of Minnesota Agr. Exp. Sta. Bul. 333, September, 1937, p. 22. (Out of print.)

Table 11. Minnesota Dairy Cooperatives by Total Assets and Commodity Type. Fiscal Year Ended 1949

Total assets dollars	Commodity type			
	Total Butter	Milk and cream	Cheese	Mixed dairy
	number of associations			
Less than 10,000	15	13	1	0
10,000-29,999	118	106	6	0
30,000-49,999	105	84	18	2
50,000-69,999	98	77	15	4
70,000-99,999	74	53	12	9
100,000-149,999	57	50	2	4
150,000-299,999	47	39	7	1
300,000 and over	20	11	5	3
Total	534	433	66	19

butter associations was \$78,132 at the outset of 1950. The assets of 66 associations which had shifted to the marketing of milk and cream rather than butter averaged \$123,455 at the midcentury point. Among the factors which accounted for these increases were: (1) inflationary influences; (2) additional investment required as several hundred plants shifted from a cream to milk basis of operation; (3) gradual modernization of plants; and, (4) changes required to meet rising sanitary requirements.

Current Assets

Maintenance of an adequate supply of currently available funds is one of the more difficult financing problems confronting dairy cooperatives. There must be sufficient liquid assets to pay patrons for milk and cream, to meet the demands of creditors, to pay employees, to buy needed supplies, and for other purposes.

Total current assets of all the dairy associations averaged \$25,751, or 29.5 per cent of total assets (table 10). About one-third of the current assets, an average of \$8,560, was held in cash form.

Accounts receivable—General accounts receivable consisting of amounts due from buyers of their products av-

eraged \$9,640, or a little over a third of the current assets. Accounts receivable from patrons averaged a little over \$2,000 and included principally amounts due on various sideline supplies sold to patrons. The need for a reserve for bad debts was not great for most dairy associations. General accounts receivable were almost entirely collectible, and most of the patrons' accounts receivable could be charged off against the patrons' accounts payable. In the case of diversified cooperatives which had many sideline supply patrons who were not also marketing patrons, uncollectible accounts were more of a problem. This was revealed by the mixed dairy cooperatives which had made larger provisions for bad debts.

Inventories—The inventories of these associations were only 5.4 per cent of total assets at the end of the 1949-50 fiscal year. Local dairy associations do not maintain large inventories of their products since these usually are shipped at frequent intervals—once a week or oftener. The largest inventories were held by the dairy associations which carried a line of farm supplies for sale to their patrons. In general, the problem of inventory control was small among dairy cooperatives with the exception of those which sold a large volume of farm supplies. Inventories of fuel and other supplies to be used in processing its products were classified as prepaid expenses under other assets.

Investment in Other Cooperatives

Some dairy cooperatives have found it advisable to own and control marketing facilities further along the marketing channels extending from producers to consumers. Most of this expansion has been accomplished through the organization of federated cooperative associations of various types. While the investments reported were largely in regional federations, some were in small

FIG. 3. Cheddaring is one of the stages in the manufacture of cheese.



local area federations, and some were in local cooperatives from which supplies and services were obtained.

Investments in other cooperatives averaged \$17,509, or about 20 per cent of the total assets of the local associations (table 10). Many butter associations had a larger investment in their regional cooperative than they had in their physical facilities. The combined investments in other cooperatives were \$9,350,000, most of which was in the form of preferred stock, certificates of interest, and allocated reserves. These investments largely represented accumulated savings from marketing farm products and purchasing farm supplies rather than cash outlays.

In 1934 the average investment of a sample of 146 Minnesota creamery associations in other cooperatives was about \$1,400 each, or about 5.3 per cent of total assets.⁵ In 1950 the investments 433 butter associations had in other cooperatives averaged \$16,776, or 21.5 per cent of total assets. The increase may be explained in part by more adequate financing of the federated marketing organizations with which the local associations were affiliated. Another major factor was that many local creameries had made large new invest-

ments in central milk drying plants during the war and postwar years.

Fixed Assets

The fixed assets of dairy cooperatives are the land, buildings, equipment, and similar physical facilities used in their operations. These cooperatives had an average of \$64,393 per association invested in buildings and equipment (table 10). This was the original cost of these facilities. The original cost of buildings and equipment in 433 butter associations averaged \$58,961 and in the milk and cream associations \$78,636. In 1934 the original cost of buildings and equipment in a sample of 146 creamery associations in the state averaged only \$22,673. The major shift from the cream basis of operation to a milk basis which occurred in many plants in this period plus the greatly increased cost of new facilities were among the principal factors responsible for this large increase.

The average net value of the physical facilities of all dairy associations in the state was \$39,442. This was the amount which remained after subtracting accumulated depreciation of \$24,951 from the original cost. The accumulated depreciation is shown in the reserve for depreciation account.

⁵ Op. cit., p. 21.

Provision for depreciation enables an association to retain assets in the business equal to the cost value of the expired plant and is a means of protecting its capital against dissipation. The availability of these assets to make replacements of the plant depends on financial policies followed by the management. Most of the dairy cooperatives in the state made some provision for depreciation; however, in many cases it was not adequate. Where depreciation was understated or not provided for, operating costs of the association were likewise understated. In consequence, net margins either were overstated or the patrons were paid more for their products than current operating results warranted. On the balance sheet the under-depreciation of the facilities had the effect of overstating the value of the fixed assets and likewise overstating the equity of the patrons in the business.

Other Assets

The other assets consisted principally of prepaid expenses such as inventories of fuel, packaging supplies, chemicals, and office supplies. The amounts involved were relatively small, averaging only 3.8 per cent of the total assets (figure 4). There were a few miscellaneous assets which included principally long-term notes receivable.

SOURCES OF CAPITAL

The general sources from which dairy cooperatives may obtain capital may be classified into two broad groups: (1) creditor and (2) owner (net worth) sources. In cooperatives the owner capital is supplied principally by the members and patrons. Owner or net worth capital is distinguished from creditor capital by the fact that owner capital does not include promises of a definite interest return or a fixed maturity date.

Total capital of the 534 local dairy associations averaged \$87,374, of which \$25,322, or 29 per cent, was from creditor sources and \$62,050, or 71 per cent, from owner sources (table 12). In 433 butter associations 28 per cent of all capital was obtained from creditor sources and 72 per cent from owners. In 1934 a sample of 146 butter associations in the state obtained 26 and 74 per cent of total capital from creditor and owner sources, respectively.

Creditor Sources

Of the creditor capital obtained by dairy cooperatives an average of \$21,054, or 24.1 per cent of total assets, was in the form of current liabilities due in a year or less (table 12). Long-term liabilities were the source of only \$4,268, or slightly less than 5 per cent of all capital. The proportion of long-term liabilities varied considerably from 2.3 per cent of total assets in the milk and cream associations to 16.5 per cent in the cheese cooperatives and 19.5 per cent in the mixed dairy associations.

Accounts payable—patrons—The largest suppliers of credit to these dairy associations were the farmer patrons who delivered milk or cream under various pooling arrangements. In most cases patrons were paid once or twice a month after the association had processed and sold the products and actual costs were deducted. Credit supplied in this way (accounts payable—patrons) averaged \$13,249 for each association, which represented over one-half of all their liabilities. Associations which shorten their pooling period or shift to a cash basis of payment forego some of this source of credit. In these cases additional credit must be obtained elsewhere, or more equity capital must be obtained, usually at some additional cost.

Other current payables—A small volume of credit, \$2,264 for each association, was obtained on open account (ac-

counts payable—general) from various wholesalers and manufacturers from whom dairy plant supplies or farm supplies intended for resale were purchased. The mixed dairy association with larger farm supply departments had a larger volume of book credit, \$5,684 on the average, which was supplied by the general creditors. The item "other current liabilities" con-

sisted largely of accrued payables for wages, taxes, and other items.

Borrowed funds—Dairy cooperatives relied in varying degrees on borrowed funds (written promises to pay) as a source of capital. An average of \$2,966 per association was obtained on short-term notes maturing in a year or less and \$3,963 on long-term notes, mortgages, or bonds payable (table 12).

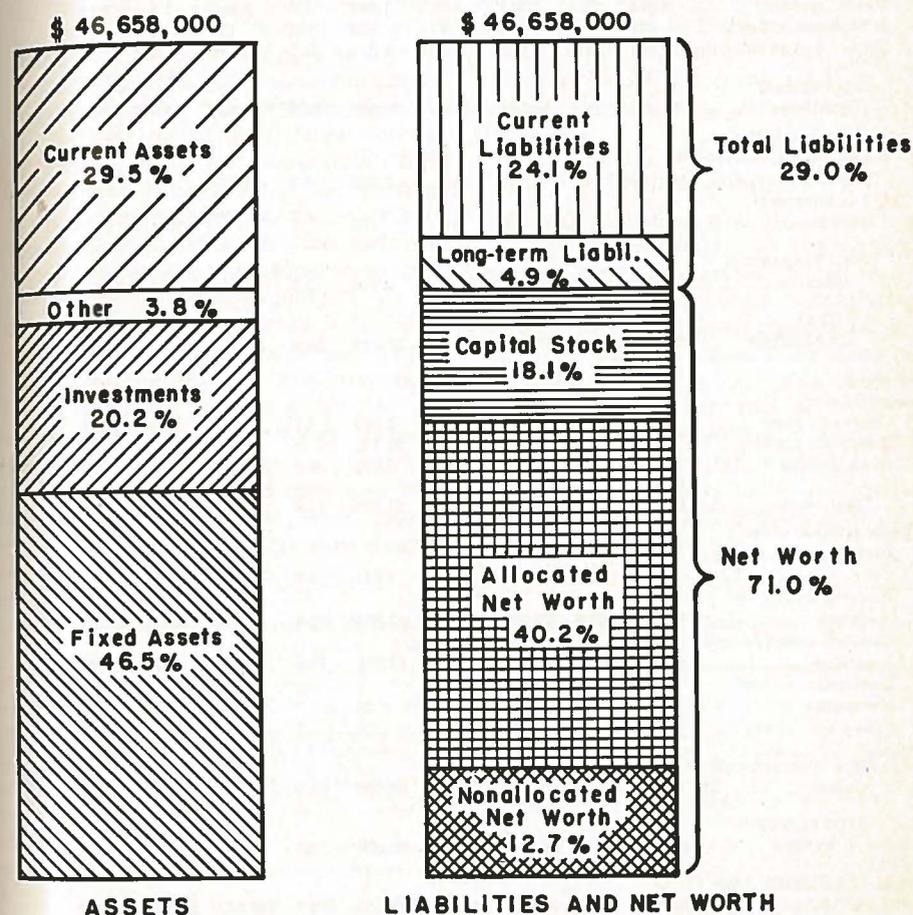


FIG. 4. Financial status of 534 Minnesota dairy cooperatives at the close of the fiscal year, 1949.

Table 12. Average Liabilities and Net Worth of Minnesota Dairy Cooperatives, by Commodity Type, Fiscal Year Ended 1949*

	All associations		Commodity type							
	dollars	per cent	dollars	per cent	dollars	per cent	dollars	per cent	dollars	per cent
Liabilities										
Current liabilities										
Accounts payable—										
general	2,264	2.6	1,688	2.2	4,712	3.8	3,687	2.5	5,684	4.7
Accounts payable—										
patrons	13,249	15.2	12,171	15.6	19,728	16.0	25,000	16.9	5,421	4.4
Notes payable	2,966	3.4	2,912	3.7	1,985	1.6	2,687	1.8	7,842	6.4
Patronage refunds	601	.7	642	.8	424	.3	125	.1	684	.8
Other current liabilities	1,974	2.2	1,672	2.1	3,212	2.6	2,188	1.4	4,369	3.6
Total current liabilities	21,054	24.1	19,085	24.4	30,061	24.3	33,687	22.7	24,000	19.7
Long-term liabilities										
Notes, bonds, mortgages payable	3,963	4.5	2,901	3.7	2,500	2.0	24,375	16.5	16,053	13.2
Other long-term liabilities	305	.4	0	0.0	288	.3	0	0.0	7,579	6.3
Total long-term liabilities	4,268	4.9	2,901	3.7	2,788	2.3	24,375	16.5	23,632	19.5
TOTAL LIABILITIES	25,322	29.0	21,986	28.1	32,849	26.6	58,062	39.2	47,632	39.2
Net worth										
Capital stock										
Common stock	6,708	7.7	6,734	8.6	4,591	3.7	4,000	2.7	15,737	13.0
Preferred stock	7,307	8.4	4,984	6.4	18,530	15.0	28,375	19.2	3,526	2.9
Stock credits	1,781	2.0	1,416	1.8	4,576	3.7	625	.4	1,368	1.1
Total stock	15,796	18.1	13,134	16.8	27,697	22.4	33,000	22.3	20,631	17.0
Reserves and other										
Certificates of equity, etc.	2,066	2.4	1,353	1.7	5,621	4.6	0	0.0	7,684	6.3
Patrons' equity reserves	33,103	37.8	30,670	39.3	43,955	35.6	54,000	36.5	33,263	27.3
General reserves and surplus	11,028	12.6	10,954	14.1	13,076	10.6	3,000	2.0	12,369	10.2
Undistributed net margins	9	†	7	†	30	†	0	0.0	0	0.0
Other net worth	50	.1	28	†	227	.2	0	0.0	0	0.0
Total reserves and other	46,256	52.3	43,012	55.1	62,909	51.0	57,000	38.5	53,316	43.8
TOTAL NET WORTH	62,052	71.0	56,146	71.9	90,606	73.4	90,000	60.8	73,947	60.8
TOTAL LIABILITIES AND NET WORTH	87,374	100.0	78,132	100.0	123,455	100.0	148,062	100.0	121,579	100.0
Number of associations	534		433		66		16		19	

* For the assets section of the balance sheet see table 10.

† Less than 0.05 per cent.

Only 247, or 46 per cent, of the dairy associations used borrowed funds during 1949. The average borrowing of this group of associations at their peak was \$16,060 per association (table 13). The average year-end balance of outstanding obligations was \$13,310. The difference of \$2,750 was the net amount paid off by the associations during the year.

The 247 associations which used borrowed funds had a total of 445 loans outstanding in 1949, many of which were carried over from previous years (table 13). About two-fifths of the 445 loans were obtained from commercial banks, one-third from individuals, one-tenth from the St. Paul Bank for Cooperatives, and the remainder from other sources. In terms of the amounts of funds about 31 per cent was obtained from commercial banks, 26 per cent from individuals, and 16 per cent from the Bank for Cooperatives.

Seventy per cent of the loans were facility loans (for the purchase of plant and equipment), and the remainder were operating capital loans (to pay farmers for products, to pay labor, to buy supplies, etc.).

About 55 per cent of the loans were long-term (one year or more) and 35 per cent were short-term (one year or

less). The remainder were payable on demand.

Forty-five per cent of the loans were not secured, and the remainder were backed almost equally by chattel mortgages and real estate mortgages. More than one-half of the loans were repayable on a lump sum basis, two-fifths in fixed periodic payments, and the remainder in periodic payments based on some measure of business volume. Most of the last group of loans were made by the St. Paul Bank for Cooperatives.

The most common (modal) rate of interest was 4 per cent paid on 168 notes, followed by 5 per cent paid on 102 notes.

Owner Sources

Sound financing requires that cooperatives, like other business enterprises, have a large proportion of net worth or owner capital in their capital structure. This capital is important in providing a cushion against business adversities. It is also desirable that the current patrons of the organization supply it with the largest proportion of its capital. This is important if control of the association is to be maintained in the hands of those most concerned with its operation.

Table 13. Average Borrowing of Minnesota Dairy Cooperatives, by Commodity Type, Fiscal Year Ended 1949

Commodity type	Number of associations reporting	Number of associations borrowing	Number of loans*	Average borrowing per association			
				Average maximum size of loan†	Maximum amount†	Year-end balance	Amount paid off
				dollars			
Butter	433	202	377	7,151	13,346	10,863	2,483
Milk and cream	66	25	39	9,921	15,476	10,764	4,712
Cheese	16	8	11	39,655	54,525	53,925	600
Mixed dairy	19	12	18	24,878	37,317	32,725	4,592
Total	534	247	445	8,914	16,060	13,310	2,750

* In most cases an individual note was considered a loan. Several associations had a number of small notes each, mostly from individuals, which were identical in all respects except face amount. In each such case, these notes were added together and tabulated as a single loan.

† The maximum size of loan was the face amount for loans made in 1949, and the amount outstanding at the beginning of the year for loans made prior to 1949.

The total net worth or owner capital in the local dairy cooperatives of the state averaged \$62,052, or 71 per cent of total assets (table 12). The net worth or owner capital of these cooperatives included various combinations of common stock, preferred stock, certificates of equity, patrons' equity reserves (book credits), net worth reserves, and other items.

Capital stock—Of the capital supplied from owner sources \$15,796, or about 18 per cent of total assets, was in the form of capital stock and stock credits. Of this amount \$6,708 was in common stock. Five hundred of the 534 local associations obtained some funds from the sale of common stock. In many cases the funds derived from the sale of common stock were only of nominal importance. In these cases only enough common was sold to qualify patrons as voting members, and the large bulk of owner capital was obtained by issuing other types of equities. This practice appears to be increasing.

The use of preferred stock in financing dairy cooperatives in the state has increased in recent years. A total of

112 local associations used preferred stock in their financial structure. For all of the local dairy associations preferred stock was the source of 8.4 per cent of total capital. A factor in its increased use is that since it does not carry voting rights it can be sold more widely than common stock and can be held by nonpatrons without endangering the tax-exempt status of the association.

Stock credits appeared on the statements of many associations. These credits usually resulted when the association distributed patronage refunds in common or preferred stock credits, or in cases where per unit product retains (butterfat deductions) were applied toward the purchase of stock.

It should be noted that very little of the owner capital of local dairy cooperatives was acquired by the outright purchase of stock. A large proportion of owner capital was acquired by making butterfat deductions from patrons.

These deductions were applied to the purchase of stock or were included in the reserves. Much owner capital also was obtained by retaining net margins



FIG. 5. Filling cans with 40 per cent cream for out-of-state shipment. Fluid milk, condensed milk, and ice cream mix also are shipped by many plants.

(savings) in the business. In cooperative organizations it is important that product retains (butterfat deductions) and net margins retained be allocated to the credit of the patrons who supplied them.

Certificates of equity—On the average a little over \$2,000 of owner capital was obtained by the issue of various types of certificates of equity including certificates of interest, revolving fund certificates, and others. Most of these certificates were issued by associations affiliated with the large central marketing cooperatives. Revolving certificates and other noncash patronage refunds received from the central organization often were allocated to the credit of local patrons by the local associations and evidenced by similar certificates.

Patrons' equity reserves—Patrons' equity reserves were used extensively in the owner financing of dairy cooperatives in the state. These reserves averaged \$33,103 and represented the largest single source of capital (table 12). Patrons' equity reserves represent patronage refunds retained in the business in the form of book credits to the accounts of individual patrons. It was usually the intent that these credits would be held for a period of years and then paid in cash on a revolving capital plan. Other net worth reserves which were allocated on a patronage basis and which carried other names were included in this grouping. Increasing care in the handling of patrons' book credits is strong evidence of the cooperative character of these associations.

General reserves and surplus—The Minnesota cooperative law requires that 10 per cent of the annual net margins be set aside as surplus (general reserve) until this account equals 50 per cent of the paid-in capital. Formerly this reserve was not allocated, but a 1949 ruling of the attorney general of the state holds that allocation of this

reserve to the patrons is permissible. The average balance in general reserves and surplus was \$11,028, none of which was allocated.

Revolving Capital Financing

Many Minnesota dairy cooperatives have adopted the revolving capital plan of financing. Under this plan funds are obtained from patrons by keeping patronage refunds in the business or by means of product retains (per unit product deductions). These retains are continued until the amount of capital has reached a desired level. When this stage is reached the oldest capital increments are returned to the patrons each year at the same time that new retains are made in a continuing process. The plan has many advantages, including the fact that patrons help finance the association in proportion to the use they make of it and in installments which usually are not burdensome.

At midcentury 294 out of 534 local dairy associations (55 per cent) had adopted the revolving capital plan. It was found that a larger proportion of the associations with a large volume of total assets used the revolving plan (table 14). Less than one-half of the small associations with assets under \$30,000 were using the plan.

The average balance in revolving accounts at the end of the fiscal year was \$62,119 (table 15). During the year the associations using the plan added an average of \$6,622 to their revolving accounts and paid out an average of \$2,245. This indicates that, in general, the plans were still in the accumulation phase.

Approximately one-half of the associations had not retired any of their capital by the end of the 1949 fiscal year. Among the plants which had reached the revolving stage, a revolving period of three to eight years in length was most popular. Associations

Table 14. Minnesota Local Dairy Cooperatives Using Revolving Capital Accounts, by Total Assets, Fiscal Year Ended 1949

Total assets dollars	Number of associations reporting	Number of associations using revolving accounts	Percentage of associations using revolving accounts
Less than 10,000	15	0	0
10,000-29,999	118	23	19.5
30,000-49,999	105	54	51.4
50,000-69,999	98	63	64.3
70,000-99,999	74	55	74.3
100,000-149,999	57	47	82.5
150,000-199,999	23	16	69.5
200,000-299,999	24	18	75.0
300,000 and over	20	18	90.0
Total	534	294	55.0

using this plan of financing should consider the danger that patrons may lose faith in a plan in which the repayments are delayed for too long a period. In only eight cases was the revolving period fixed in advance. In the remainder the length of the period was left to the discretion of the board of directors.

Some of the associations revolved more than one account. Most of the 306 accounts revolved were patrons' equity reserves, but there were also 21 preferred stock, 17 certificates, and 12 common stock accounts revolved. A majority of the revolving accounts were set up from 1935 through 1944. In over

Table 15. Additions, Retirements, and Year-End Balances in Revolving Capital Accounts, by Commodity Type, Minnesota Dairy Cooperatives, Fiscal Year Ended 1949

Commodity type	Number of associations reporting	Number of associations using revolving accounts	Number of capital accounts revolved	Average amount per association using revolving accounts		
				Added in 1949	Retired in 1949	Year-end balance
Butter	433	237	246	5,713	1,873	53,152
Milk and cream	66	35	36	10,486	5,086	104,057
Cheese	16	6	7	19,000	833	167,000
Mixed dairy	19	16	17	7,000	2,062	63,875
Total	534	294	306	6,522	2,245	62,119

80 per cent of the cases no interest or dividends were ever paid on capital in the revolving accounts.

FINANCIAL RATIOS

Analysis of the relationship (ratio) between certain balance sheet items is useful in determining the relative solvency and financial strength of these associations.

Current ratio—Probably the most widely used of the ratios of financial condition is the current ratio, or the ratio of the current assets to the current liabilities. This ratio is a measure of the current solvency, that is, the current debt-paying ability of the business. To be currently solvent an association should have current assets at least equal to its current liabilities. For most business organizations a current ratio of 2 to 1, \$2 of current assets to each \$1 of current liabilities, is considered a desirable minimum by financial analysts. Cooperative dairy associations which pay their patrons on a monthly or bimonthly pooling plan may operate with a current ratio slightly below this level without too much trouble.

The current ratio for all dairy associations averaged 1.22 to 1, which falls considerably short of the desired 2 to 1 relationship (table 16). Table 17 shows that 218 associations, about two-fifths,

Table 16. Average Financial Ratios of Minnesota Dairy Cooperatives by Commodity Type, Fiscal Year Ended 1949

Commodity type	Number of associations	Current assets to current liabilities	Net worth to net fixed assets plus investments	Net worth to total assets
Butter	433	1.44	1.05	60.8
Milk and cream	66	1.17	1.28	71.9
Cheese	16	1.48	0.80	73.4
Mixed dairy	19	0.94	0.89	60.8
Total	534	1.22	1.06	71.0

Table 17. Minnesota Dairy Cooperatives by Commodity Type, and Current Assets to Current Liabilities Ratio, Fiscal Year Ended 1949

Commodity type	Current assets to current liabilities ratio					
	Total	Less than 0.50	0.50-0.99	1.00-1.49	1.50-1.99	2.00 and over
		number of associations				
Butter	433	43	141	116	38	78
Milk and cream	66	3	19	21	7	13
Cheese	16	3	4	3	1	2
Mixed dairy	19	0	5	6	4	4
Total	534	49	169	146	50	97

had current ratios below the 1 to 1 level. Such a ratio allows for no emer-

gencies and may be considered dangerously low.

Net worth ratios—The ratio of net worth to total assets indicates to what extent the association is financed by owner capital and to what extent with borrowed capital. A high ratio reveals a favorable financial condition in that the association is financed primarily by the owners and the debt burden is low in consequence. For all of the dairy associations this ratio averaged 0.71 to 1, or 71 per cent. A 70 per cent ownership is considered to be desirable. About one-half of the associations fell below this level. About 14 per cent had ratios of less than 50 per cent, which reflects a weak financial condition.

A common rule of sound finance for this type of business is that the fixed assets plus investments should be financed by owner capital. The ratio of net worth to fixed assets plus investments should be at least 1 to 1. For all associations this averaged 1.06 to 1 (table 16).

Many dairy cooperatives need to obtain additional capital from their members to protect themselves against financial difficulties in the years ahead. Many smaller associations in areas of declining dairy volume face particularly difficult financial problems which may in time require drastic action or failure will result.

Operations

The success of dairy cooperatives is largely dependent upon and measured in terms of operating results. The important factors affecting these results are receipts and operating costs. The difference between these is the amount available for distribution to patrons in payment for their products. Dairy associations vary in organization, size of business, products handled, and methods of operation. These variations and

their relationships with one another affect any conclusions that may be drawn regarding the causes of success or failure.

VOLUME OF BUSINESS

Total receipts (net sales plus service income) of the 534 local dairy cooperatives were \$193,145,000 in 1949, an average of \$361,669 per association (table

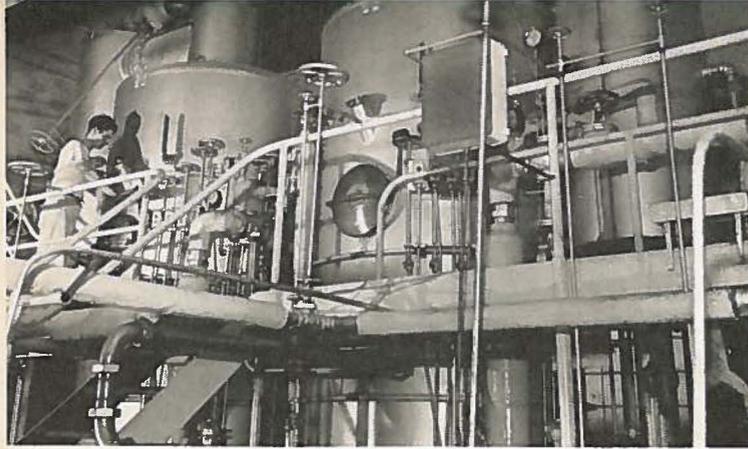


FIG. 6. Vacuum pans, or evaporators, are used to remove much of the moisture in milk before it is dried. Vacuum pans also are used in manufacture of many other dairy products.

18). These receipts were derived chiefly from dairy products, followed by farm supplies, farm products other than dairy, and farm business services. There were wide variations in business volume among all of the commodity types. The most common (modal) groups of butter and cheese associations had business volumes less than \$200,000 in 1949 (table 19). The modal groups for milk and cream and mixed dairy associations had larger volumes. The more diversified associations were generally larger than the specialized ones. Most of the highly specialized butter and cheese associations were small country plants.

Net sales—Average net sales varied from a low of \$330,520 for the butter associations to \$502,879 for the mixed dairy associations (table 18). Milk and cream associations, with average sales of \$456,536, were consistently larger than the butter associations. The associations which handled milk and cream often were the larger volume dairy plants before the shift to milk occurred. During much of the 1940's the associations on a milk basis were able to pay relatively better prices and attracted additional patronage. In contrast the plants which remained on a cream basis and made only butter tended to lose volume to milk plants. Some of the milk plants handled milk for bottling use and obtained relatively higher re-

turns for their products. Included in the milk and cream group was a number of milk drying plants which must have a relatively large volume of milk to warrant such processing.

Source of income—The sources of sales income varied in importance among the different commodity types. Cheese cooperatives led with 99.4 per cent of their sales income from dairy products (figure 7). Mixed dairy cooperatives obtained only 50.3 per cent of their income from this source, butter associations 89.0 per cent, and milk and cream associations 94.2 per cent. Butter associations handled proportionally more farm supplies than did milk and cream cooperatives. Over one-fifth of

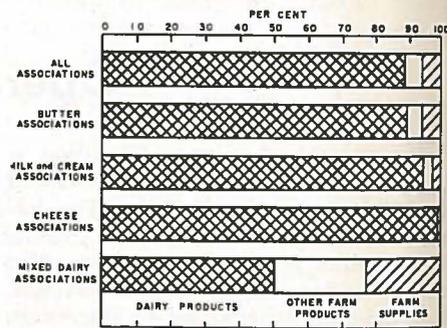


FIG. 7. Sources of sales income of Minnesota dairy cooperatives, by commodity type, fiscal year ended 1949.

Table 18. Average Operating Statement of Minnesota Dairy Cooperatives by Commodity Type, Fiscal Year Ended 1949

	All associations			Commodity type							
				Butter		Milk and cream		Cheese		Mixed dairy	
	dollars	per cent	per cent	dollars	per cent	dollars	per cent	dollars	per cent	dollars	per cent
Net sales	356,830	100.0	330,520	100.0	465,536	100.0	447,331	100.0	502,879	100.0	
Cost of sales:											
Purchases from patrons	293,700	82.3	276,402	83.6	374,100	80.4	389,312	87.0	328,405	65.3	
Other purchases and net inventories	20,832	5.8	18,915	5.7	12,648	2.7	(-612)	(-0.1)	110,900	22.1	
Total cost of sales	314,532	88.1	295,317	89.3	386,748	83.1	388,700	86.9	439,305	87.4	
GROSS MARGIN ON SALES	42,298	11.9	35,203	10.7	78,788	16.9	58,631	13.1	63,574	12.6	
Service income	4,839	1.3	4,608	1.4	3,873	0.8	6,081	1.4	12,468	2.5	
TOTAL GROSS MARGIN	47,137	13.2	39,811	12.1	82,661	17.7	64,712	14.5	76,042	15.1	
Operating expenses:											
Wages and salaries:											
Plant and sales	11,921	3.4	9,455	2.8	22,254	4.8	19,744	4.4	25,637	5.1	
Management	4,038	1.1	3,977	1.2	4,492	1.0	3,631	0.8	4,195	0.9	
Office	1,745	0.5	1,580	0.5	2,074	0.4	1,406	0.3	4,668	0.9	
Total wages and salaries	17,704	5.0	15,012	4.5	28,820	6.2	24,781	5.5	34,500	6.9	
Taxes:											
Real estate and personal property	1,017	0.3	931	0.3	1,411	0.3	1,331	0.3	1,342	0.3	
Social security	313	0.1	258	0.1	518	0.1	444	0.1	732	0.1	
Total taxes	1,330	0.4	1,189	0.4	1,929	0.4	1,775	0.4	2,074	0.4	
Other operating expenses	22,865	6.4	18,737	5.7	44,703	9.6	34,612	7.8	31,200	6.2	
Total operating expenses	41,899	11.8	34,998	10.6	75,452	16.2	61,168	13.7	67,774	13.5	
NET OPERATING MARGIN	5,238	1.4	4,873	1.5	7,209	1.5	3,544	0.8	8,268	1.7	
Other income (less other expenses)	608	0.2	658	0.2	485	0.1	637	0.1	(-284)	(-0.1)	
NET MARGIN	5,846	1.6	5,531	1.7	7,694	1.6	4,181	0.9	7,984	1.6	
Number of associations	534		433		66		16		19		

Table 19. Minnesota Dairy Cooperatives by Volume of Business and Commodity Type, Fiscal Year Ended 1949

Volume of business dollars	Total	Commodity type			
		Butter	Milk and cream	Cheese	Mixed dairy
Less than 100,000	57	47	3	6	1
100,000- 199,999	130	120	5	3	2
200,000- 299,999	110	86	17	2	5
300,000- 399,999	88	69	17	0	2
400,000- 499,999	54	41	9	1	3
500,000- 599,999	30	22	6	0	2
600,000- 699,999	11	8	1	0	2
700,000- 799,999	13	11	0	2	0
800,000- 899,999	6	5	1	0	0
900,000- 999,999	8	8	0	0	0
1,000,000-1,499,999	16	11	4	0	1
1,500,000-1,999,999	5	3	1	1	0
2,000,000 and over	6	2	2	1	1
Total	534	433	66	16	19

the income of mixed dairy cooperatives was from farm supplies.

Butter associations, in particular, were suffering from reduced butterfat volume in many cases. Some turned to sidelines to help bear overhead expenses. Several of the mixed dairy cooperatives were formerly butter associations and had added farm supply and poultry and egg sidelines. Many of the milk and cream associations were also butter plants originally, but they had diversified by adding other milk processing services. In other cases they had ceased manufacturing butter and turned to direct sale of milk and cream to other plants. These changes in operations were determined largely by the market alternatives available under their particular circumstances.

Location was an important factor affecting source of income. The southeastern dairy region (type-of-farming area 1) led with 97.5 per cent of sales income from dairy products (table 20). Cooperatives in the Red River valley and northern cut-over regions (areas 7 and 8) received 78.4 per cent of their income from dairy products. The west-central grain and livestock region (area 4) had the lowest proportion with 72.7 per cent. These associations received a

large part of their income from the sale of poultry and eggs, which accounts for most of the 19.6 per cent of income from other farm products for the area. Those in the southwestern and Red River valley regions (areas 3 and 7) also received a relatively large proportion of their income from other farm products. The northern cut-over region associations led in the proportion of sales of farm supplies, followed by those in the Red River valley and northwest areas.

Table 20. Source of Income of Minnesota Dairy Cooperatives by Type-of-Farming Area, Fiscal Year Ended 1949

Type-of-farming area	Number of associations	Source of income		
		Dairy products	Other farm products	Farm supplies
		per cent of total sales		
1	72	97.5	0.3	2.2
2	172*	93.7	2.2	4.1
3	52	84.0	10.2	5.8
4	45	72.7	19.6	7.7
5	59	92.1	1.0	6.9
6	81	83.6	8.1	8.3
7	24	78.4	12.6	9.0
8	28	78.4	6.7	14.9
Total	533	88.3	5.4	6.3

* A butter shipping association was excluded because it purchased only butter and did no processing.

Service income—Many dairy cooperatives performed various business services for their patrons, including chiefly trucking and frozen food locker services. Service income averaged \$4,839 per association (table 18). This represented a direct addition to gross margins since no cost of sales was involved. Average service income varied from \$12,468 for mixed dairy to \$3,873 for milk and cream associations.

Butterfat purchases—A total of 190,643,820 pounds of butterfat was handled by Minnesota dairy cooperatives in 1949 (table 21). Seventy-nine per cent of this was handled by the 432 associations whose primary business was butter manufacturing. Cheese associations had the highest average volume, 457,598 pounds of butterfat. Mixed dairy was lowest with 287,204 pounds per association.

OPERATING EXPENSES

Total operating expenses averaged \$41,899 for the 433 dairy associations in 1949 (table 18). Milk and cream associations had the highest average expenses with \$75,452, while butter associations averaged only \$34,938. There was less variation when these were expressed as a percentage of net sales, but milk and cream associations were still highest with 16.2 per cent and butter asso-

Table 21. Butterfat Purchased by Minnesota Dairy Cooperatives by Commodity Type, Fiscal Year Ended 1949

Commodity type	Number of associations	Butterfat purchased	
		Total	Average per associations
		pounds	
Butter	432*	150,869,005	348,771
Milk and cream	66	27,196,380	412,066
Cheese	16	7,321,560	457,598
Mixed dairy	19	5,456,875	287,204
Total	533	190,643,820	357,681

* A butter shipping association was excluded because it purchased only butter and did no processing.

ciations lowest with 10.6 per cent. This difference was due to the greater amount of processing performed by the milk and cream associations.

Wages and salaries—Wages and salaries averaged \$17,704 for the 534 dairy cooperatives (table 18). This amounted to 5.0 per cent of net sales and 42.2 per cent of total operating expenses. Total wages and salaries relative to net sales were highest for mixed dairy with 6.9 per cent, and lowest for butter associations, 4.5 per cent.

Plant, sales, and milk and cream assembly labor costs averaged \$11,921, while managerial salaries averaged \$4,038, and office salaries \$1,745 per association. The most common number of full-time employees (including managers) was two or three. And more than one-half of the dairy associations employed the equivalent of fewer than five full-time employees. However, the overall average was slightly more than seven on a full-time equivalent basis. Mixed dairy led with an average of 13.5 employees, while butter associations were lowest with an average of six.

The cost of management varied from an average of \$3,631 for cheese associations to an average of \$4,492 for milk and cream associations. These figures include payments to both managers and assistant managers. Actual compensation of managers varied from less than \$1,000 to more than \$9,000 per person (table 22). The most common rates were \$3,000 to \$4,000. Eighteen associations paid managers less than \$2,000 and 28 paid \$6,000 or more. The average amount received by managers was \$3,787, of which \$2,595 was salary, \$1,182 commissions, and the remainder bonuses.

Taxes—Real estate and personal property taxes averaged \$1,017 per association in 1949 (table 18). Social security taxes averaged \$313. Average

Table 22. Minnesota Dairy Cooperatives by Commodity Type and Total Compensation of Manager, Fiscal Year Ended 1949

Total compensation of manager	Commodity type				
	Total	Butter	Milk and cream	Cheese	Mixed dairy
dollars					
Less than 1,000	10	6	3	1	0
1,000-1,999	8	3	4	0	1
2,000-2,999	100	88	7	3	2
3,000-3,999	221	183	25	7	6
4,000-4,999	114	96	12	1	5
5,000-5,999	46	34	6	1	5
6,000-6,999	19	13	5	1	0
7,000-7,999	4	4	0	0	0
8,000-8,999	1	1	0	0	0
9,000 and over	4	1	2	1	0
Unknown	7	4	2	1	0
Total	534	433	66	16	19

taxes paid by butter associations were much lower than those for other types due to the prevalence of small country butter plants.

Other expenses—Operating expenses other than wages and salaries and taxes averaged \$22,865 (table 18). The most important elements of these expenses were fuel, packing and general supplies, depreciation, and trucking expenses. Other expenses relative to net sales were lowest for the butter associations with 5.7 per cent and highest for milk and cream associations, averaging 9.6 per cent. These expenses averaged slightly more than one-half of total operating expenses for each type of association.

NET MARGINS

Net margins of dairy cooperatives as compared to those of other commodity types are usually quite low, since most dairy cooperatives pay out a larger proportion of their net proceeds each month. This leaves little to be distributed at the end of the year. Net margins for the 534 dairy cooperatives averaged

\$5,846, 1.6 per cent of net sales, in 1949 (tables 18 and 23). Mixed dairy led in absolute amount with a \$7,984 average, while cheese associations were lowest with \$4,181.

Minnesota dairy cooperatives used a variety of methods of distributing net margins in 1949. The averages shown in table 23 are for all associations. Since most associations divided their margins among only a few accounts the average amount allocated to each account was considerably larger than the overall averages shown. Some associations had net losses in 1949, and most of them

Table 23. Average Net Margin Statement of Minnesota Dairy Cooperatives, Fiscal Year Ended 1949

	All associations	
	dollars	per cent
Patronage refunds:		
Cash or currently payable	714	12.2
Payable as a long-term liability	37	0.6
Stock and stock credits	633	10.8
Certificates of interest, etc.	161	2.8
Patrons' equity reserves	3,781	64.7
Total allocated to patrons	5,326	91.1
Dividends:		
Dividends on capital stock	320	5.5
Dividends on reserves and certificates	47	0.8
Total dividends	367	6.3
Unallocated reserves:		
General reserves and surplus	96	1.6
Educational reserve	7	0.1
Undistributed net margins	22	0.4
Total unallocated	125	2.1
Income taxes:		
Federal income tax	35	0.6
State income tax	4	0.1
Total income tax	39	0.7
Adjustments*	(-11)	(-0.2)
TOTAL NET MARGIN	5,846	100.0
Number of associations	534	

* In a few cases operating statements were not available for a full year's operations. The statements covering periods less than one year were adjusted to a 12-month basis. This figure represents the differences between the actual net margins reported and the adjusted net margins.

charged such losses to unallocated general reserves and surplus, undistributed net margins account, or to patrons' equity reserves. As a result the average net amount placed in some of the accounts was quite small.

Patronage refunds—All amounts allocated to patrons' accounts on the basis of patronage were classified as patronage refunds. They accounted for 91 per cent of the net margins in 1949 (table 23). Almost two-thirds of the total net margins were allocated to patrons' equity reserves. One-eighth was paid in cash or set aside for cash payment, and 10.8 per cent was distributed in stock and stock credits. Butter associations distributed a much higher proportion of net margins in cash than did other types. In general, those associations in more active stages of growth placed most of their refunds in permanent or revolving accounts and paid very little in cash.

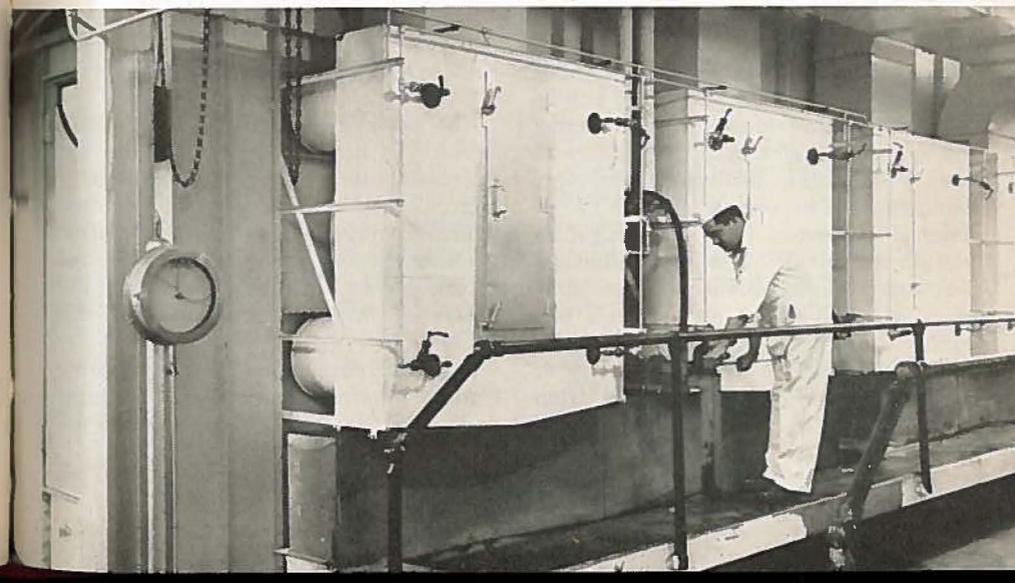
Dividends on stock—Slightly more than one-half of the capital stock associations declared dividends on stock in 1949. A few paid dividends on certificates of interest and patrons' equity

reserves. Dividends on stock averaged \$320 per association, or 5.5 per cent of net margins. The average per association paying dividends was about \$600. The most common rates paid on common stock were 6 and 4 per cent (table 3).

Unallocated reserves—General reserves and surplus were the major unallocated accounts. Few dairy associations added to these accounts in 1949. Since most losses were charged to unallocated accounts the net addition, an average of \$125, was comparatively small.

Income taxes—Federal income taxes averaged \$35 per association in 1949 (table 23). But, since only 67 associations paid income taxes, the average per association paying was \$284. Forty-five of these paid less than \$250 each and one paid more than \$2,000. Very few associations paid more than \$25 in state income taxes. About 30 of the non-exempt cooperatives paid no income taxes. Some had net losses while the others allocated all net margins to patrons, leaving no income to be taxed. Most of the nonexempt associations

FIG. 8. Front view of one type of spray drier used in drying milk. Milk is sprayed in a fine mist into a heated drying chamber and dries as it falls.



operated in such a manner that taxable income was a minimum. They distributed most of their net margins on a patronage basis.

Methods of allocating patronage refunds—More than one-half of the 383 associations which allocated net margins (or losses) to their patrons in 1949 distributed them on the basis of units of product handled (table 24). The usual basis for this method was butterfat alone with no refunds on other products or supplies handled. Value of prod-

ucts handled and supplies sold was used by 105 associations paying refunds. Two or more bases of allocation, including both physical unit and value methods, were used by 34 associations. The larger associations with departmentalized accounting often paid different rates on products handled in different departments. Many smaller associations paid on butterfat alone because they handled little else or handled everything else at as near cost as was possible.

Table 24. Minnesota Dairy Cooperatives by Commodity Type and Method Used in Allocating Patronage Refunds, Fiscal Year Ended 1949

Commodity type	Method used in allocating patronage refunds					
	Total	Percentage of value of product	Per unit of product	Both percentage of value and per unit of product	Method not known	No patronage refunds allocated
				number of associations		
Butter	433	78	164	29	37	125
Milk and cream	66	15	22	3	8	18
Cheese	16	2	4	0	4	6
Mixed dairy	19	10	4	2	1	2
Total	534	105	194	34	50	151

Operating Efficiency

Operating efficiency has two components—*marketing efficiency*, the ability to obtain high returns for products; and *processing efficiency*, the ability to handle products at low cost. Their combined effect is measured in terms of net returns to patrons. The following discussion is limited to 294 highly specialized associations because of the difficulty of comparing those which had widely divergent activities. Each of these 294 associations received 95 per cent or more of its sales income from dairy products.

MARKETING EFFICIENCY

The net price received for a product is one measure of marketing efficiency. However, this measure is influenced by factors, such as distance from market, which are not concerned with efficiency. Another measure of efficiency is the net return per unit of input. Net return per pound of butterfat was used in this analysis.

The most important factor affecting returns was the form in which products were sold. Table 25 shows that 235 as-

Table 25. Average Operating Statement per Pound of Butterfat Handled for 291 Specialized Minnesota Dairy Cooperatives by Commodity Type, Fiscal Year Ended 1949*

	All associations		Commodity type					
			Butter		Milk and cream		Cheese	
	cents per lb./bf.	per cent of total sales	cents per lb./bf.	per cent of total sales	cents per lb./bf.	per cent of total sales	cents per lb./bf.	per cent of total sales
Net sales:								
Dairy products	88.08	98.8	84.72	98.8	100.83	98.8	97.70	99.6
Other farm products	0.05	0.1	0.01	0.0	0.25	0.3	0.00	0.0
Farm supplies	0.98	1.1	1.04	1.2	0.93	0.9	0.35	0.4
Total net sales	89.11	100.0	85.77	100.0	102.01	100.0	98.05	100.0
Cost of sales:								
Purchase from patrons	77.68	87.2	75.43	87.9	85.63	83.9	85.53	87.2
Other purchases and net inventories	0.80	0.9	0.82	1.0	1.20	1.2	(-0.53)	(-0.5)
Total cost of sales	78.48	88.1	76.25	88.9	86.83	85.1	85.00	86.7
Gross margin on sales	10.63	11.9	9.52	11.1	15.18	14.9	13.05	13.3
Service income	0.94	1.1	0.94	1.1	0.77	0.7	1.33	1.4
Total gross margin	11.57	13.0	10.46	12.2	15.95	15.6	14.38	14.7
Operating expenses:								
Wages and salaries	4.19	4.7	3.75	4.3	5.85	5.7	5.49	5.6
Other operating expenses	6.00	6.7	5.29	6.2	8.66	8.5	8.03	8.2
Total operating expenses	10.19	11.4	9.04	10.5	14.51	14.2	13.52	13.8
Net operating margin	1.38	1.6	1.42	1.7	1.44	1.4	0.86	0.9
Other income (less other expenses)	0.15	0.1	0.14	0.1	0.10	0.1	0.14	0.1
Net margin	1.53	1.7	1.56	1.8	1.54	1.5	1.00	1.0
Number of associations		291		235		43		13
Average amount of butterfat per association (pounds)		382,619		369,068		411,633		531,618

* Specialized dairy cooperatives included all associations that received 95 per cent or more of their sales income from dairy products. However, three dry milk plants were excluded because they handled little or no butterfat.

sociations received most of their income from butter, 43 from milk and cream, and 13 from cheese. Three milk drying associations were excluded because they handled little or no butterfat. Milk and cream associations had the highest receipts with 100.8 cents per pound of butterfat, followed by cheese associations with 97.7 cents, and butter associations with 84.7 cents. These figures reflect differences in value of butterfat received in addition to differences in value added by processing. Many butter associations received all butterfat in

the form of cream, while other associations received mostly whole milk.

Receipts from butterfat varied directly with volume of business. Associations with business volumes less than \$200,000 received an average of about 78 cents per pound of butterfat, while associations with more than \$1,000,000 of business averaged \$1.20 per pound (table 26). This difference was due partly to processing of by-products, such as dry skim and buttermilk, and partly to handling higher value products by the larger associations.

Table 26. Average Operating Statement per Pound of Butterfat Handled for 291 Specialized Minnesota Dairy Cooperatives by Volume of Business, Fiscal Year Ended 1949*

	All associations	Volume of business										
		Less than \$100,000	\$100,000- \$199,999	\$200,000- \$299,999	\$300,000- \$399,999	\$400,000- \$499,999	\$500,000- \$599,999	\$600,000- \$699,999	\$700,000- \$799,999	\$800,000- \$899,999	\$900,000- \$999,999	\$1,000,000 and over
Net sales:												
Dairy products	88.08	78.35	78.09	81.46	81.76	81.87	81.73	89.71	90.02	89.57	95.00	119.97
Other farm products	0.05	0.00	0.00	0.01	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.28
Farm supplies	0.98	1.08	0.94	0.88	1.01	0.85	1.38	0.76	0.32	1.69	0.33	1.35
Total net sales	89.11	79.43	79.03	82.35	82.81	82.73	83.11	90.47	90.34	91.26	95.33	121.60
Cost of sales:												
Purchases from patrons	77.68	70.00	76.70	72.92	74.79	74.34	73.09	78.44	79.23	79.45	80.44	92.70
Other purchases and net inventories	0.80	0.98	(5.08)	1.48	1.12	1.03	1.62	1.17	0.29	1.86	(-0.03)	4.38
Total cost of sales	78.48	70.98	71.62	74.40	75.91	75.37	74.71	79.61	79.52	81.31	80.41	97.08
Gross margin of sales	10.63	8.45	7.41	7.95	6.90	7.36	8.40	10.86	10.82	9.95	14.92	24.52
Service income	0.94	0.39	0.45	0.80	0.75	0.85	1.24	1.08	0.85	2.54	0.24	1.87
Total gross margin	11.57	8.84	7.86	8.75	7.65	8.01	9.64	11.94	11.67	12.49	15.16	26.39
Operating expenses:												
Wages and salaries	4.19	3.85	3.18	3.47	2.97	2.94	3.75	3.77	4.36	4.48	4.42	8.86
Other operating expenses	6.00	5.40	4.01	4.45	4.05	3.87	4.33	5.61	6.18	6.34	8.27	14.19
Total operating expenses	10.19	9.25	7.19	7.92	7.02	6.81	8.08	9.38	10.54	10.82	12.69	23.05
Net operating margin	1.38	(-0.41)	0.67	0.83	0.63	1.20	1.56	2.56	1.13	1.67	2.47	3.34
Other income (less other expenses)	0.15	0.20	0.08	0.14	0.14	0.14	0.08	0.14	0.14	0.48	0.10	0.15
Net margin	1.53	(-0.21)	0.75	0.97	0.77	1.34	1.64	2.70	1.27	2.15	2.57	3.49
Number of associations	291	32	79	64	41	32	11	6	6	4	5	11
Average butterfat per association (pounds)	382.619	94.111	181.930	300.294	414.764	528.974	664.288	693.328	830.780	920.803	976.896	1,435.212

* Specialized dairy cooperatives included all associations that received 95 per cent or more of their sales income from dairy products. However, three dry milk plants were excluded because they handled little or no butterfat.

PROCESSING EFFICIENCY

Costs per pound of butterfat—Operating expenses per pound of butterfat averaged 10.2 cents for 291 specialized dairy cooperatives (table 25). Butter associations had the lowest costs with 9.0 cents, cheese followed with 13.5 cents, and milk and cream associations averaged 14.5 cents. These figures should be compared to average gross margins because they are the costs of adding value to the raw products by processing. Total gross margins per pound of butterfat averaged 16.0 cents for milk and cream, 14.4 for cheese, and 10.5 for butter associations. Net operating margins (gross margins less operating expenses) averaged 1.4, 0.9, and 1.4 cents for milk and cream, cheese, and butter associations, respectively. These figures show no significant variation because differences in net receipts were adjusted for in the initial payments to patrons for butterfat.

Average operating costs varied considerably by volume of business. Costs per pound of butterfat decreased from 9.2 cents for associations with less than \$100,000 of business to 6.8 cents for those with business from \$400,000 to \$500,000 (table 26). Above \$500,000 of business, costs were directly related to volume, reaching 23.0 cents for associations with \$1,000,000 or more of business. This increasing cost with volume was due to the relatively higher costs of processing by-products by the larger associations. The large associations handled more bottle milk, ice cream, dry milk, and other high-value, high-cost products. Net operating margins varied consistently with business volumes, from an average loss of 0.4 cents per pound for the smallest associations to a gain of 3.3 cents for the largest associations.

Management also influences costs. Two managerial factors, experience

and salary, were analyzed. However, no significant results were obtainable due to the complication of other factors. Managerial salaries were closely related to volume of business.

Costs per pound of butter—The 240 associations that utilized 50 per cent or more of their butterfat in the production of butter were selected for this analysis. In computing costs per pound of butter, all butterfat handled by these associations was considered in terms of butter equivalent because costs of manufacturing butter were not segregated from other costs. Operating expenses in three-fourths of these associations ranged from four to eight cents a pound of butter (table 27). Forty-eight associations had costs of eight cents a pound and over.

There was no significant relationship between costs per pound of butter and volume of business or volume of butter equivalent handled. With the exception of the associations that handled 800,000 pounds or more, costs were about the same for all groups (table 27). A larger proportion of the large associations had high costs per pound of butter for reasons previously mentioned.

Operating expenses were also closely related to the assets' turnover ratio. Gross fixed assets were more closely related to costs per pound of butter than were total assets. Ninety per cent of the associations with fixed asset turnover ratios of 10.0 or more had costs less than 6.0 cents per pound of butter, while only 25 per cent of those with ratios under 4.0 had such low costs (table 28). More than one-half of the associations with costs of 10.0 cents and over had turnover ratios less than 4.0. Since fixed costs were almost directly proportional to the investment in fixed assets, the extent to which those assets were utilized was a major factor of operating costs.

Table 27. Specialized Minnesota Dairy Cooperatives by Operating Expenses per Pound of Butter and Volume of Butter Equivalent, Fiscal Year Ended 1949*

Volume of butter equivalent	Operating expenses per pound of butter (cents per pound)					
	Total	Less than 4.0	4.0-5.9	6.0-7.9	8.0-9.9	10.0 and over
pounds						
		number of associations				
Less than 200,000	48	3	26	11	2	6
200,000-399,999	86	12	41	21	6	6
400,000-599,999	53	8	24	13	3	5
600,000-799,999	23	2	13	6	2	0
800,000-999,999	13	2	2	2	4	3
1,000,000 and over	17	0	4	2	2	9
Total	240	27	110	55	19	29

* Only those associations that utilized 50 per cent or more of their butterfat in the production of butter were included.

Table 28. Specialized Minnesota Dairy Cooperatives by Operating Expenses per Pound of Butter and Gross Fixed Assets' Turnover, Fiscal Year Ended 1949*

Gross fixed assets' turnover ratio†	Operating expenses per pound of butter (cents per pound)					
	Total	Less than 4.0	4.0-5.9	6.0-7.9	8.0-9.9	10.0 and over
		number of associations				
Less than 4.0	40	1	9	11	2	17
4.0-5.9	74	4	23	26	13	8
6.0-7.9	64	7	40	12	2	3
8.0-9.9	23	5	13	3	2	0
10.00 and over	39	10	25	3	0	1
Total	240	27	110	55	19	29

* Only those associations that utilized 50 per cent or more of their butterfat in the production of butter were included.

†Gross fixed assets' turnover ratio was computed by dividing gross fixed assets into total receipts for each association.

Labor costs—Wages and salaries were more closely related to volume of business than were total costs. Labor costs averaged 3.5 per cent of total receipts for associations with business volumes of \$400,000 to \$500,000 (table 29). Labor costs were inversely related to volume of business for smaller associations but directly related for the larger associations. It was mentioned before that higher costs among the larger associations were attributable to the higher proportion of by-products processed. Since this processing required a large amount of labor relative to the value of the products, high labor costs were not necessarily an indication of inefficiency.

Table 29. Percentage That Wages and Salaries Were of Total Receipts of Specialized Minnesota Dairy Cooperatives by Volume of Business, Fiscal Year Ended 1949

Volume of business	Number of associations	Percentage that wages and salaries were of total receipts
dollars		
Less than 100,000	32	4.8
100,000-199,999	79	4.0
200,000-299,999	64	4.2
300,000-399,999	41	3.6
400,000-499,999	32	3.5
500,000-999,999	32	4.5
1,000,000 and over	11	7.2
Total	291*	4.7

* Three dry milk plants were not included because they handled little or no butterfat.

Table 30. Specialized Minnesota Dairy Cooperatives by Volume of Business and Total Receipts per Employee, Fiscal Year Ended 1949

Volume of business	Total receipts per employee (dollars)					
	Total	Less than 40,000	40,000-59,999	60,000-79,999	80,000-99,999	100,000 and over
dollars						
		number of associations				
Less than 100,000	31	8	12	8	3	0
100,000-199,999	79	10	18	23	11	17
200,000-299,999	64	6	18	16	13	11
300,000-399,999	41	3	10	7	14	7
400,000-499,999	32	1	9	4	13	5
500,000-999,999	33	5	10	8	4	6
1,000,000 and over	12	6	2	3	1	0
Total	292*	39	79	69	59	46

* Total receipts per employee were unknown for two associations.

A big factor in relative labor costs and a measure of labor efficiency was total receipts per employee, which were related to volume of business. Table 30 shows the distribution of 292 of the specialized associations according to volume of business and receipts per employee. While there were both high and low ratios in all size groups, a larger proportion of the associations with volumes from \$300,000 to \$500,000 had high receipts per employee. One-half of the associations with business of \$1,000,000 or more had receipts per employee less than \$40,000.

RETURNS TO PATRONS

Net returns to patrons (the initial payment plus patronage refunds) are determined by the degree of efficiency in both marketing and processing. As a measure of operating efficiency, net returns per pound of butterfat suffers the shortcoming of not allowing for the value of skim milk where butterfat was purchased as cream. Net returns averaged 87.17 cents for milk and cream, 86.53 cents for cheese, and 76.99 cents per pound of butterfat for butter associations.⁹ The figure for butter as-

sociations was largely the result of purchasing a larger proportion of butterfat as cream.

Average initial payments varied from 70.0 cents per pound of butterfat for associations with business of less than \$100,000 to 92.7 cents for those with business of \$1,000,000 or more (table 26.) Net margins (and patronage refunds) varied in the same manner. The smallest associations averaged a net loss of 0.2 cents per pound and the largest averaged a net gain of 3.5 cents. Combining these figures, the range of net returns was from 69.8 to 96.2, or 26.4 cents per pound of butterfat. Since the small associations received mostly cream and the large ones received mostly whole milk, this represented the equivalent of at least 98.6 cents per hundred pounds of skim milk.¹⁰

However, cream also contains some skim milk, so the returns to farmers

⁹ These figures are the sums of the average purchases from patrons and net margins shown in table 25. Since patronage refunds averaged 90 per cent of net margins, these figures are reasonable estimates of true net returns. Purchases for patrons included payments for skim milk as well as butterfat. A very small amount of other farm products was also included.

¹⁰ This was computed on the basis of 3.6 per cent butterfat milk.

for the additional skim milk in whole milk was \$1.08 per hundredweight.¹¹ The estimated value of skim milk fed to hogs was 62 cents per hundredweight in 1949.¹² The large dairy associations paid their patrons an average of 46 cents per hundredweight more for their skim milk than its feeding value, if the value of butterfat is assumed to be that paid by the small associations. Con-

Commodity Analysis

This discussion of business statistics includes the four regional dairy associations in addition to the 534 local dairy cooperatives in Minnesota. The regional associations are Land O'Lakes Creameries, Inc., the Twin City Milk Producers Association, Rochester Dairy Cooperative, and North Star Dairy Cooperative.

SUMMARY OF BUSINESS

Minnesota dairy cooperatives had a total business volume of \$337,294,088 in 1949 (table 31). Nearly 92 per cent of this was farm products marketed, 7 per cent farm supplies sold, and 1 per cent farm business services. Duplications arising from interassociation transactions plus business for patrons in other states amounted to \$95,668,080 of the total business, leaving a net of \$241,626,008 transacted for Minnesota patrons.

About 73 per cent of the total business was done by butter, 22 per cent by milk and cream, 2 per cent by cheese, and 3 per cent by mixed dairy

¹¹ This was computed on the basis of 30.0 per cent butterfat cream.

¹² This figure was based on the value of seven pounds of tankage (\$6.00 per cwt.) and one-fifth bushel of corn (\$1.00 per bu.). It might be more or less on any particular farm depending on feeding practices and feed prices.

sidered on a whole milk basis, patrons of the large dairy associations netted about 44 cents per hundredweight more for their milk as compared with patrons of the small associations, disregarding differences in costs of producing milk. This indicates that the large associations were considerably more efficient than the small associations in their overall operations.

associations. The proportions of net Minnesota business handled by the different types were about the same as for total business. Marketing receipts constituted over 90 per cent of the business of each type except mixed dairy, where it accounted for 75 per cent.

Although farm supplies and services accounted for only 8 per cent of total receipts, 478 of the dairy associations handled farm supplies and 326 performed farm business services. There was considerable evidence among the dairy cooperatives of a tendency toward diversification. Many of the butter associations had turned to sideline operations to offset the effects on costs of declining dairy business. In some cases the addition of sidelines was due primarily to patron demand for the additional services. Poultry and egg marketing was the leading sideline, followed by farm production supplies. Other sidelines were of minor importance as a whole.

MARKETING FARM PRODUCTS

Dairy products—Total receipts from dairy products marketed by Minnesota dairy cooperatives amounted to \$284,921,355 in 1949 (table 32). This was 84 per cent of all receipts and 92 per cent of the receipts from marketing of these

Table 31. Summary of Business, 538 Minnesota Dairy Cooperatives by Commodity Type, Fiscal Year Ended 1949

Commodity type and type of business	Number of associations handling	Total business	Interassociation transactions and business done in other states	Net Minnesota business
dollars				
Butter associations:				
Farm products marketed	434	224,457,706	69,297,029	155,160,677
Farm supplies sold	389	20,807,015	9,084,186	11,722,829
Services performed	267	2,259,765	82,415	2,177,350
Total	434	247,524,486	78,463,630	169,060,856
Milk and cream associations:				
Farm products marketed	69	70,709,109	12,958,090	57,751,019
Farm supplies sold	59	1,097,223	0	1,097,223
Services performed	41	916,872	0	916,872
Total	69	72,723,204	12,958,090	59,765,114
Cheese associations:				
Farm products marketed	16	7,111,459	1,764,872	5,346,587
Farm supplies sold	11	45,873	0	45,873
Services performed	6	97,388	0	97,388
Total	16	7,254,720	1,764,872	5,489,848
Mixed dairy associations:				
Farm products marketed	19	7,371,263	1,693,106	5,678,157
Farm supplies sold	19	2,183,500	788,382	1,395,118
Services performed	12	236,915	0	236,915
Total	19	9,791,678	2,481,488	7,310,190
All dairy associations:				
Farm products marketed	538	309,649,537	85,713,097	223,936,440
Farm supplies sold	478	24,133,611	9,872,568	14,261,043
Services performed	326	3,510,940	82,415	3,428,525
Total	538	337,294,088	95,668,080	241,626,008

associations. Net business for Minnesota patrons was \$204,082,374.

Butter was the leading dairy product. It was handled by some 500 of the 538 associations. A total of 271,532,753 pounds of butter was marketed for \$164,524,559. Net receipts for butter amounted to \$119,329,664 after removal of duplications and out-of-state business. Shipped butter was 81 per cent of the net total, butter sold locally was 12 per cent, and the balance was sold to patrons.

Wholesale milk was second in value of sales. A total of 35,459,423 pounds of butterfat was sold as wholesale milk for \$33,370,969, of which \$26,077,976 was net Minnesota business. Dried skim milk ranked third with a gross of 219,-

257,608 pounds sold for \$26,691,241. Cheese sales were fourth, 58,800,607 pounds marketed for \$20,132,282. Wholesale cream, fluid skim milk, and retail whole milk also were important sources of receipts.

Poultry and eggs—The marketing of poultry and eggs has become an important sideline in many dairy associations. Particularly in southwestern Minnesota, dairy cooperatives turned to poultry and eggs to maintain volume as their dairy business declined. Many of them already had some of the necessary facilities and were able to make the adjustment easily as the pattern of farm output changed. A large part of the shift from dairy to poultry occurred during World War II. In some 18 cases,

Table 32. Farm Products Marketed by 538 Minnesota Dairy Cooperatives, Fiscal Year Ended 1949

Farm products marketed	Number of associations handling	Total units handled*	Total value of products handled	Interassociation transactions	Business done in other states	Net Minnesota business
dollars						
Dairy products						
Butter, local	491	22,896,357 lb.	14,467,168	4,492	0	14,462,676
Butter, patrons	494	13,770,932 lb.	8,593,911	0	0	8,593,911
Butter, shipped	496	234,865,464 lb.	141,463,480	29,155,473	16,034,930	96,273,077
Buttermilk, dried	32	12,306,337 lb.	1,141,889	147,611	127,427	866,851
Buttermilk, fluid	468		928,010	404,150	0	523,860
Cheese	21	58,800,607 lb.	20,132,282	1,855,593	10,741,218	7,535,471
Cottage cheese	13	781,718 lb.	136,370	0	0	136,370
Cream, dried	†	82,200 lb./bf.	50,629	26,623	0	24,006
Cream, retail	254	1,240,228 lb./bf.	1,477,276	16,168	0	1,461,108
Cream, wholesale	151	15,275,152 lb./bf.	12,260,289	1,755,855	0	10,504,434
Ice cream	9	800,599 gal.	1,242,180	0	0	1,242,180
Ice cream mix	3	3,430,685 lb.	503,800	23,876	0	479,924
Milk, condensed	5	10,810,398 lb.	1,066,583	881	0	1,065,702
Milk, dried	4	12,211,950 lb.	4,645,375	3,570	0	4,641,805
Milk, evaporated	†	16,570,066 lb.	1,966,379	0	1,247,443	718,936
Milk, retail	160	3,852,196 lb./bf.	6,049,841	68,316	0	5,981,525
Milk, wholesale	220	35,459,423 lb./bf.	33,370,969	7,292,993	0	26,077,976
Skim milk, condensed	4	10,333,782 lb.	675,986	18,098	0	657,888
Skim milk, dried	35	219,257,608 lb.	26,691,241	3,478,324	3,610,302	19,602,615
Skim milk, fluid	238		6,769,891	4,706,557	2,274	2,061,060
Whey, dried	2		158,420	3,451	0	154,969
Whey, fluid	19		268,328	89,169	0	179,159
Other dried products	4		488,042	24,187	0	463,855
Other fluid products	17		373,016	0	0	373,016
Total dairy	538		284,921,355	49,075,387	31,763,594	204,082,374
Poultry and eggs						
Chickens, dressed	11	7,935,220 lb.	2,888,875	103,170	761,113	2,024,592
Chickens, live	62	3,606,250 lb.	781,810	70,926	0	710,884
Ducks and geese	3		1,761	775	0	986
Turkeys, dressed	6	7,332,595 lb.	3,612,578	143,371	926,833	2,542,374
Turkeys, live	4	20,800 lb.	7,667	217	0	7,450
Eggs, dried	†	1,525,115 lb.	1,952,302	0	0	1,952,302
Eggs, frozen	†	1,802,060 lb.	650,307	0	0	650,307
Eggs, shell	87	965,363 case	13,654,504	847,339	1,879,820	10,927,345
Total poultry and eggs			23,549,804	1,165,798	3,567,766	18,816,240
Vegetables			459	0	0	459
Grain			87,806	0	0	87,806
Livestock			429,047	95,715	0	333,332
Meat and hides			294,402	44,837	0	249,565
Miscellaneous			366,664	0	0	366,664
GRAND TOTAL	538		309,649,537	50,381,737	35,331,360	223,936,440

* Total includes interassociation transactions and business done in other states.
 † Less than three associations.

associations organized as dairy cooperatives shifted to the extent that they could no longer be classified as dairy cooperatives. In 1949, about 100 dairy

associations handled \$23,549,804 of poultry and eggs, of which \$18,816,240 was the net for Minnesota farmers. Eighty-seven associations handled



FIG. 9. A dairy plant laboratory. Dairy products are carefully tested for quality and other characteristics at various stages in the production process.

965,363 cases of eggs for total sales of \$13,654,504. Six associations sold 7,332,595 pounds of dressed turkeys for \$3,612,578. Dressed chickens and dried eggs were important products.

Other farm products—Other products marketed by the dairy cooperatives included livestock, meat, hides, grain, potatoes, and timber products. These products were important for only a few associations, and their combined sales were \$1,178,378.

FARM SUPPLIES

The farm supply business of Minnesota dairy cooperatives was \$24,133,611 in 1949 (table 33). Almost \$10,000,000 of this was interassociation and out-of-state business. All but 60 of the associations handled farm supplies in 1949.

Production supplies—The sales of production supplies, such as feed, seed, fertilizer, and machinery accounted for

\$20,392,408, or 84 per cent of all supplies handled by dairy cooperatives. Feed, handled by 272 associations, led in sales with \$11,028,145 for 128,881 tons. Machinery and implements, including dairy plant equipment sold by one of the federations, ranked second with \$3,837,666. Nearly one-half of the total sales of production supplies were interassociation and out-of-state transactions. This indicates that a large share of these supplies was handled cooperatively at the wholesale, as well as the retail, level.

Petroleum products and auto supplies—Dairy cooperatives handled a total of \$1,463,260 of these products in 1949. Few dairy associations entered this line, probably because it did not fit in with their major operations as well as other supply lines.

General merchandise—Except for the large number of associations handling cheese for patrons, few dairy coopera-

Table 33. Farm Supplies Sold by 478 Minnesota Dairy Cooperatives, Fiscal Year Ended 1949.

Supplies sold	Number of associations handling	Unit	Total units handled	Total value of supplies handled	Interassociation transactions and business done in other states	Net Minnesota business
						dollars
Petroleum products and auto supplies:						
Gasoline	23	gallon	3,800,344	937,937	246,367	691,570
Kerosene and fuel oil	17	gallon	1,798,628	279,473	160,663	118,810
Lubricating oil	19	gallon	76,044	63,456	19,799	43,657
Grease	17			11,497	2,982	8,515
Tires and tubes	10			31,795	0	31,795
Accessories and parts	15			105,315	0	105,315
Other auto supplies	11			33,787	9,490	24,297
Total				1,463,260	439,301	1,023,959
Production supplies:						
Feed	272	cwt.	2,577,617	11,028,145	4,715,847	6,312,298
Seeds	78	cwt.	74,596	1,533,517	956,616	576,901
Fertilizer	56	ton	28,549	1,578,926	1,271,078	307,848
Other crop supplies	54			158,983	0	158,983
Machinery and implements	18			3,837,666	1,102,067	2,735,599
Hardware	18			36,716	0	36,716
Dairy supplies	152			315,916	0	315,916
Building materials	5			2,230	0	2,230
Total				16,933,409	1,038,578	654,831
Miscellaneous production supplies:						
Automobiles and trucks	†			206,900	0	206,900
Total				206,900	0	206,900
General merchandise:						
Coal	18			171,404	0	171,404
Groceries (incl. cheese)	390			2,056,757	349,081	1,707,676
Electrical appliances	4			3,284	0	3,284
Dry goods and clothing	†			35,561	0	35,561
Other general merchandise	5			10,937	0	10,937
Total				2,277,943	349,081	1,928,862
GRAND TOTAL	478			24,133,611	9,872,568	14,261,043

* Sixty dairy cooperatives handled no farm supplies.

† Less than three.

tives handled general merchandise. The total business volume was \$2,277,943 in 1949, of which more than \$2,000,000 were accounted for by groceries (including cheese).

FARM BUSINESS SERVICES

Services performed for patrons amounted to \$3,510,940 in 1949 (table

34). This was a relatively large volume since this value is comparable to gross margins rather than sales of farm products and supplies. Whereas services amounted to only 1 per cent of total receipts, they accounted for 7.5 per cent of the total gross margins in 1949.

The most important business service performed was milk and cream haul-

ing. Two hundred and one dairy associations performed trucking services for their patrons, and the total trucking receipts exceeded \$2,000,000. This did not include contract hauling. The second most important service was

frozen food locker operations, totaling \$939,433 for 108 associations. Some associations rented out their plants and facilities, and this also was an important source of revenue for these associations.

Regional Cooperatives

Four large regional dairy cooperatives are located in Minnesota. These organizations differ from local associations in that they serve dairy producers in a much larger supply area. Each of the four serves dairymen in at least one other state. Usually the regional cooperatives also differ from the local associations in that they emphasize the performance of some or all of the marketing functions needed after a product leaves the local processing plant and until it reaches the consumer.

Land O'Lakes Creameries, Inc.—The largest of the regional dairy cooperatives in the state is Land O'Lakes Creameries, Inc., of Minneapolis, which was incorporated June 7, 1921. This organization is owned by and provides various marketing and purchasing services for about 460 local dairy associations including creameries, cheese factories, other dairy plants, and breeding associations in Minnesota, Wisconsin, North and South Dakota. The local associations have a membership of about 100,000 farmers. Land O'Lakes itself owns and operates 18 milk drying plants, 12 poultry and egg processing plants, 8 hatcheries, 6 frozen food locker plants, 5 ice cream plants and 4 miscellaneous milk plants.

Land O'Lakes' business volume totaled \$102,000,000 in 1949 and \$112,000,000 in 1952 (table 35). About three-fourths of the total business volume consisted of dairy products. These products and related lines of egg and poultry products were marketed in all parts

of the United States, principally through the association's branch distribution offices in 20 cities. Sales of dairy equipment, dairy supplies, feeds, seeds, and fertilizers through its member cooperatives constituted over 10 per cent of the total business volume.

Total assets of Land O'Lakes at the midcentury point were \$28,796,563 (table 38). Of this total over \$13,000,000, or 46 per cent, were obtained from member and patron sources in the form of capital stock, certificates of interest, and various net worth reserves.

Twin City Milk Producers Association—The leading fluid milk marketing cooperative in the state is the Twin City Milk Producers Association (St. Paul), which was incorporated January 2, 1917.

Table 34. Farm Business Services Performed by 326 Minnesota Dairy Cooperatives, Fiscal Year Ended 1949

Service performed	Number of associations	Amount of business
dollars		
Locker rentals	108	551,801
Slaughtering	31	66,827
Cutting, wrapping, freezing	68	293,032
Grinding, curing, smoking	24	27,773
Total locker service	108	939,433
Trucking	201	2,020,506
Warehousing	4	59,398
Grain cleaning	*	1,269
Feed grinding and mixing	12	30,694
Auto and machinery repair	*	19,825
Gasoline station services	10	9,381
Commissions	20	36,262
Rentals and others	130	394,172
GRAND TOTAL	326	3,510,940

* Less than three.

In 1949 this cooperative had 6,635 members located within a radius of about 40 miles of the Twin Cities. This cooperative arranges for the sale of the milk of its patrons to fluid milk distributors in the Twin Cities' market area and processes milk not needed in fluid form into various manufactured dairy products.

The total value of dairy products sold by the association in the fiscal years 1949 and 1952 was \$22,264,050 and \$26,288,771, respectively (table 36). About 80 to 90 per cent of the total sales consisted of various fluid milk and cream items. The remainder represented the value of manufactured products including principally dried milk, condensed milk, and butter.

Table 35. Type and Value of Products Sold by Land O'Lakes Creameries, Inc., Minneapolis, Minnesota, 1949 and 1952

	1949	1952
	dollars	
Dairy products:		
Butter	44,992,778	45,761,160
Dried milks	13,217,366	15,149,231
Cheese	13,736,378	10,524,805
Other	6,165,722	10,369,350
	78,112,244	81,804,546
Egg and poultry products	12,145,977	13,140,012
Feed, seed, and fertilizer	7,097,193	12,221,293
Dairy equipment and supply sales	3,673,558	4,089,620
Miscellaneous	1,313,296	1,193,284
TOTAL	102,342,268	112,448,755

Table 36. Type and Value of Products Sold by Twin City Milk Producers Association, St. Paul, Minnesota, 1949 and 1952

	1949	1952
	dollars	
Whole milk-fluid	12,161,308	16,505,799
Cream and ice cream	5,551,754	6,145,047
Skim milk and buttermilk	431,340	495,080
Dried milks	1,555,045	1,179,667
Butter	1,439,679	674,976
Condensed products	1,124,924	1,288,202
TOTAL	22,264,050	26,288,771

At the close of its 1949 fiscal year the association had \$4,389,139 of assets. Two-thirds of this amount was supplied by members and patrons (table 38).

Rochester Dairy Cooperative—Rochester Dairy Cooperative was incorporated as a cooperative in December, 1941, but had started in the dairy business as a general corporation some 15 years earlier. At the close of 1949 the association's membership totaled 2,681 dairy farmers. In addition to the milk of these producers the association processed the milk received by 16 member cooperative creameries. The area served includes 24 counties in Minnesota, Iowa, and Wisconsin.

The association's sales for the fiscal years 1949 and 1952 totaled \$14,309,469 and \$16,228,000, respectively (table 37). This included a diversified line of fluid and manufactured dairy products. Manufactured products including dried milks of various types, butter, condensed milks, and ice cream made up about 80 per cent of the 1949 sales. Large quantities of fluid milk and cream are shipped principally to consuming areas in the East and South.

At the midcentury point, Rochester Dairy Cooperative had \$5,783,222 of assets of which 48 per cent were supplied from owner (net worth) sources (table 38).

Table 37. Type and Value of Products Sold by Rochester Dairy Cooperative, Rochester, Minnesota, 1949 and 1952

	1949	1952
	dollars	
Dried milks	5,600,455	5,421,284
Butter	4,252,502	3,166,790
Condensed products	1,130,666	1,819,432
Ice cream and mix	626,635	898,094
Fluid milk and cream:		
Local sales	621,772	982,934
Shipped sales	2,077,439	3,939,798
Total	14,309,469	16,228,332

Table 38. Condensed Balance Sheets of Four Regional Dairy Cooperatives in Minnesota, Fiscal Year Ended 1949

	Land O'Lakes Creameries, Inc. Dec. 31, 1949	Twin City Milk Producers Association Sept. 30, 1949	Rochester Dairy Cooperative Sept. 30, 1949	North Star Dairy Sept. 30, 1949
Assets				
Current assets	\$16,861,400	\$ 2,734,090	\$ 1,716,473	\$ 517,775
Investment assets	383,033	45,921	114,043	15,000
Fixed assets (net)	10,840,215	1,435,971	3,436,689	46,852
Other assets*	711,915	173,157	516,017	93,636
TOTAL ASSETS	28,796,563	4,389,139	5,783,222	673,263
Liabilities				
Current liabilities	10,366,767	1,466,126	1,925,006	384,330
Long-term liabilities	5,197,122	0	1,086,523	0
TOTAL LIABILITIES	15,563,889	1,466,126	3,011,529	384,330
Net worth				
Capital stock and credits	8,829,073	1,596,853	2,070,282	179,161
Reserves and certificates	4,403,601	1,326,160	701,411	109,772
TOTAL NET WORTH	13,232,674	2,923,013	2,771,693	288,933
TOTAL LIABILITIES AND NET WORTH	28,796,563	4,389,139	5,783,222	673,263

* Includes prepaid expenses.

North Star Dairy—The newest of the dairy regionals in Minnesota is North Star Dairy (St. Paul), organized in 1943. The membership of this organization consists of four large central milk drying cooperatives in the state which, in turn, have a membership of about 48 local creamery associations.

The total values of dairy products marketed by the association were \$4,319,000 and \$5,701,000 in 1949 and 1952, respectively. Products handled by the association consist almost entirely of dried milks of many types, and also include condensed milks and fluid milk

and cream when markets for these products are favorable.

North Star Dairy's total assets at the end of 1949 were \$673,263 (table 38).

Northern Cooperative Exchange (Wadena) operates much like a regional dairy cooperative and arranges for the sale of the butter produced by 15 member creameries in northwestern and north-central Minnesota. However, this organization was not included among the dairy associations because it is engaged principally in over-the-road trucking which is the main source of its gross margins.

Summary and Conclusions

Dairy marketing was the principal business of 538 farmers' cooperatives in Minnesota in 1949. Of these, 434 were butter associations, 69 milk and cream, 16 cheese, and 19 mixed dairy cooperatives. They were located in 84 of Min-

nesota's 87 counties, being concentrated most heavily in the southeast and central regions of the state.

Almost one-fifth of the dairy cooperatives were originally organized prior to 1900, and 70 per cent before 1920.

Very few organizations have been started since 1930. However, most of the older associations have been reorganized under more recent cooperative laws. The total number of dairy cooperatives declined in the past two decades. The number of cooperatives manufacturing butter has declined by nearly one-fifth since the peak in 1928. The declining volume of butterfat production in some areas of the state has been a major factor in this change.

Most of the associations adhered closely to the commonly accepted principles of cooperation, such as democratic control, equal treatment of members and nonmembers, and distribution of net proceeds on a patronage basis. Four-fifths of the associations had obtained exemption from paying federal and state income taxes. Many others met most or all of the legal requirements for income tax exemption.

These associations had an average of 227 members and 228 patrons, of which 36 members were not current patrons and 37 patrons were not members. Associations with excessive membership requirements usually had many patrons who were not members. Those who were lax in enforcing membership policies usually had many nonpatron members, mostly retired farmers.

Total assets averaged \$87,374 for the 534 local dairy cooperatives. They ranged from a few thousand to more than a million dollars in assets. The most common (modal) asset group was \$10,000 to \$30,000. Proportionately, most of the smaller associations were butter and cheese cooperatives.

Current assets averaged 29.5 per cent of total assets, while current liabilities averaged 24.1, giving a current ratio of 1.22 to 1. This was considerably below the 2 to 1 generally considered desirable. However, the pool method of payment for butterfat permits dairy associations to operate successfully with

very low current ratios. Forty per cent of the dairy association had ratios less than 1 to 1, which allows no margin of safety and is unsatisfactory even with the pooling method.

Owner capital (net worth) averaged 71 per cent of total assets. About one-half of the associations were higher than the 70 per cent ownership level considered the desirable minimum. Fourteen per cent had less than 50 per cent owner equity, reflecting a weak financial condition. More than one-half of the liabilities were accounts payable to patrons. The amount owed to "outsiders" (general accounts payable, accruals, and formal borrowing) averaged only 13 per cent of total assets.

The revolving capital plan of financing had been adopted by 294 associations. About one-half of them recently started the plan and had not reached the actual revolving stage. The average balance in revolving accounts at the end of the 1949 fiscal year was \$62,119. The revolving capital plan was used to a much greater extent by the larger associations than by the smaller ones.

Total receipts averaged \$361,669 for the local dairy association. The modal business volume was \$100,000 to \$200,000 for butter associations, while that for milk and cream and mixed dairy associations was considerably larger. Average butterfat volume was 357,681 for all local associations. It was highest for cheese and lowest for mixed dairy cooperatives.

Operating expenses averaged 11.8 per cent of net sales, with milk and cream having the highest and butter associations the lowest averages. Operating expenses of the largest proportion of 240 specialized butter associations ranged from four to eight cents a pound. Wage and salary expense was the largest element of operating expenses, followed by fuel, packing and general supplies, depreciation, and truck expense.

Among a selected group of 291 highly specialized dairy cooperatives, milk and cream associations had the highest average receipts per pound of butterfat with 100.8 cents, followed by cheese with 97.7, and butter associations with 84.7. Receipts per pound of butterfat handled were directly related to business volume. The larger associations handled more high value products and processed more by-products. They had substantially higher operating costs, but more important, returns paid to patrons for butterfat were higher.

The largest specialized associations paid, on the average, one-third more for butterfat (including the allowance for skim milk) than did the smallest associations. Considered on a whole milk basis, and allowing for the farm feeding value of skim milk, the large associations netted their patrons about 44 cents per hundredweight more than did the small associations. This indicates the superior efficiency of the large diversified dairy cooperatives.

Total business was \$337,294,088 in 1949 for all dairy cooperatives including the four regional associations. The net Minnesota business after deducting out-of-state and interassociation transactions was \$241,626,008. Dairy products comprised 84.5 per cent, other farm products 8.2 per cent, farm supplies 5.9 per cent, and related services 1.4 per cent of net Minnesota business. The leading dairy products were butter, wholesale milk and cream, and dry skim milk. Eggs, turkeys, and chickens were the most important of the other farm products marketed. Feed, dairy equipment, and groceries were the leading farm supplies handled.

This midcentury survey of Minnesota dairy cooperatives has shown that these organizations have maintained their predominant position in the dairy industry of the state. Most of the associations have been reasonably success-

ful in making adjustments to the rapid economic and technological changes of recent years. A large proportion can rightfully claim many accomplishments for their members, including improved market outlets, relatively better returns for products handled, and efficient and economical operations under difficult inflationary conditions.

Among the more significant changes made by many of these organizations is the shift to the whole milk basis of operation permitting utilization of all of the milk solids. This study shows that a large proportion of the plants which made this change has improved the returns of their patrons. A number of associations has shifted to processing of a more diversified line of dairy products in order to capitalize on changes in the price relationships of the various products.

There has been an increasing awareness among many dairy cooperatives of the advantages of a larger volume of business and the industry-wide trend toward larger plants. Some have increased their volume by moving promptly and aggressively into the fuller utilization of milk in their area. A few have gained volume by consolidation of small, relatively inefficient associations into larger associations. Some have purchased other dairy firms and merged them with their own. Many have gained volume by time-honored methods of superior management, improved services, and better returns paid to producers.

Through their regional dairy cooperatives, larger associations, and marketing federations, dairy farmers are controlling more of the marketing of their products further along the channels to the consumer.

This survey has shown that many of these cooperatives have made progress in improving their organizational structure and cooperative procedures. There

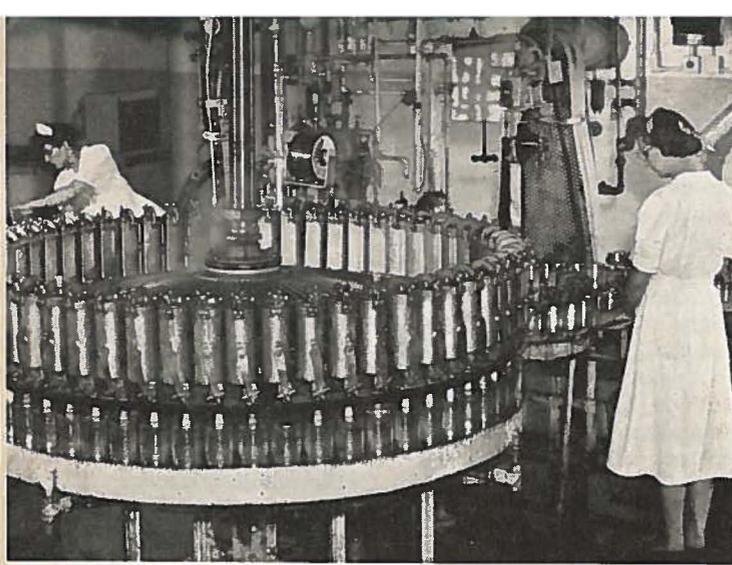


FIG. 10. Filling and sealing cans of evaporated milk.

has been a distinct improvement in allocating to the patrons' credit net margins and butterfat deductions kept in the business for the purpose of financing. More general use of revolving capital plans has improved the financing of many associations.

While significant progress has been made by these organizations the problems which confront them are numerous and challenging. Most dairy cooperatives may better their economic

position by giving more attention to the improvement of membership relations, to more flexible and adequate financial programs, more efficient plant operations, and improved marketing practices. Among most there is need for the adoption of more modern technological and business methods. The importance of selecting competent management and leadership to provide guidance in the sound solution of these problems cannot be overstressed.

Station Bulletin 421

June 1953



MINNESOTA FARM SUPPLY ASSOCIATIONS



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