

ORGANIZATION AND OPERATION OF

Minnesota Cooperative Creameries

COOPERATION

When Is a Creamery Cooperative

what about state and federal co-
operative laws . . . income tax
exemption . . . producer control . . .
membership responsibility . . .

COMPETITION

How Do Creameries Compete Butterfat

are there too many creameries
will trucks solve the problem
who pays for needless duplication

MANUFACTURING

How Can Manufacturing Be Cut

how important is volume . . .
paid for labor and supplies . . .
use of labor and plant . . .

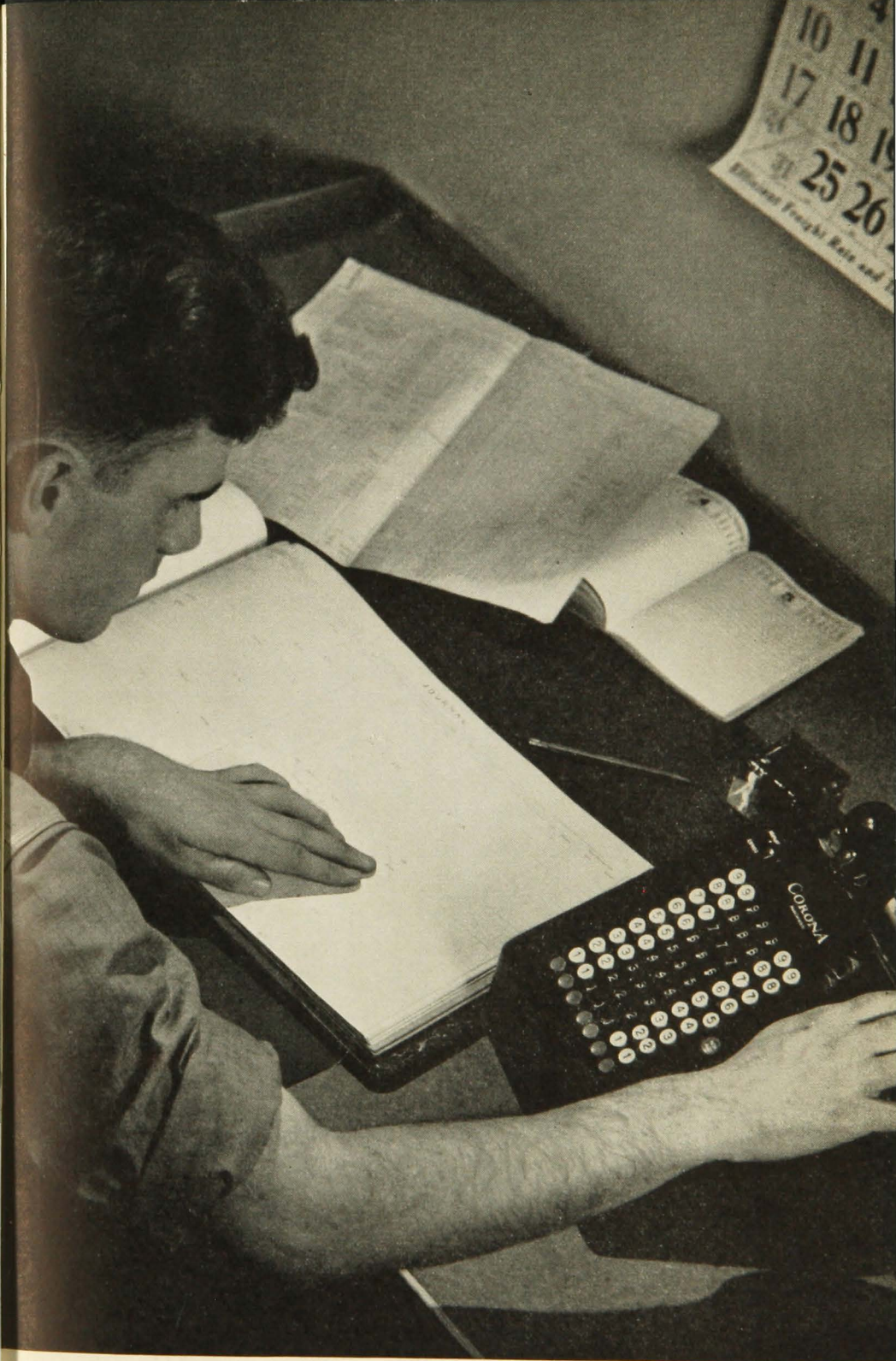
MARKETING

How Can Net Price for Butter Be Increased

what effect has volume . . . local
outlets . . . transportation . . .
quality . . . packaging . . .

E. FRED KOLLER
O. B. JESNESS

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Minnesota Cooperative Creameries

E. FRED KOLLER AND O. B. JESNESS¹

INTRODUCTION

Many significant changes necessitating major readjustments in the organization and operation of individual creamery plants and in the creamery industry as a whole have occurred in the last two decades. These include changes in butterfat assembly made possible by improvements in transportation; expansion in dairying; quality improvement; federation of creameries for marketing purposes; conversion of some creameries from a gathered-cream to a gathered-wholemilk basis; increase in sideline services offered patrons; a gradual shift to a more intensive use of creamery by-products; changes in creamery manufacturing techniques; changes in legislation, notably that affecting cream grading and cooperation; and radical changes in butter prices.

The purpose of this study was to ascertain the present status of the organization and operations of Minnesota's cooperative creameries in order to find what adjustments they have made to the new trends and developments in the industry. This bulletin places particular emphasis on an analysis of the factors affecting the efficiency of cooperative creameries. The analysis should yield information of particular value to the managers, officials, members, and patrons of the creameries covered in the survey. At the same time the results are of general value to those associated with other creameries in this territory and those who have the responsibilities of leadership in the industry.

Scope of the Study and the Source of Data

In obtaining the data for this study representatives of the Division of Agricultural Economics of the University of Minnesota visited 175 cooperative creameries in various parts of the state in the summer of 1935 (see Fig. 1). Only those creameries were selected whose main function was the manufacture of butter. This excluded city plants engaged mainly in the distribution of milk and cream, and excluded those

¹ Acknowledgment is made of the helpful suggestions of Rex W. Cox of the Division of Agricultural Economics. Credit is due Harold F. Hollands, formerly of the Division of Agricultural Economics, who participated in the field work and in some of the analysis, and Joseph Shaw who assisted in the field work. Appreciation is expressed to creamery operators and officials for their wholehearted cooperation in supplying information and to the Department of Agriculture, Dairy and Food for supplying supplementary statistical and accounting data.

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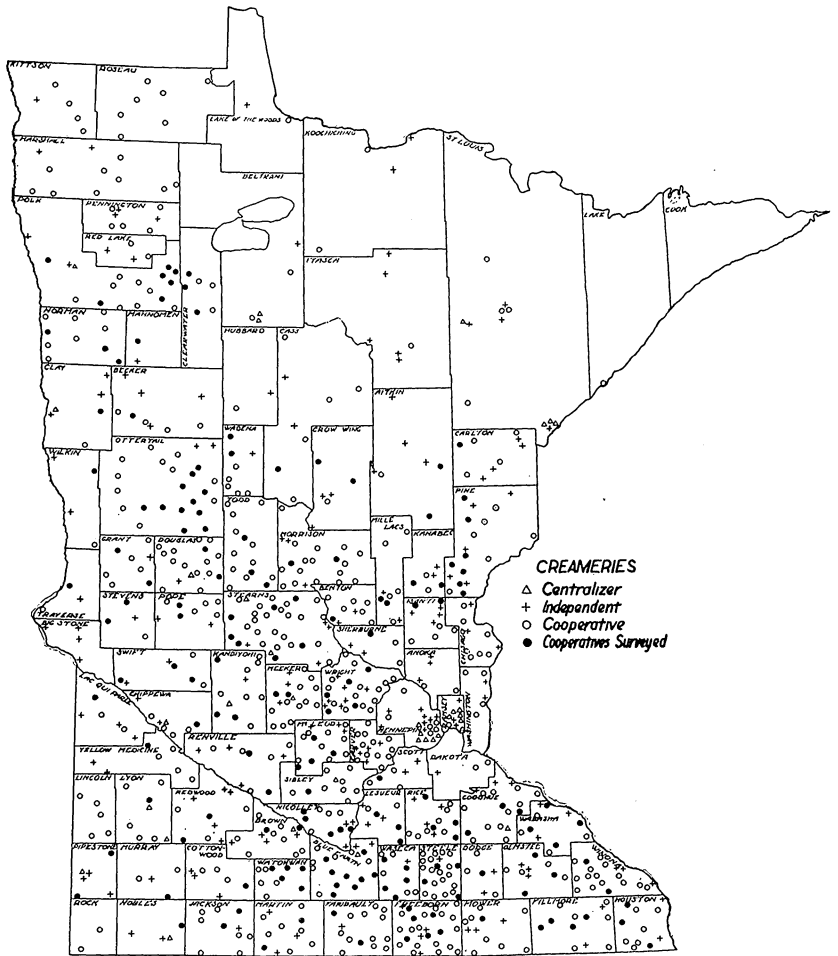


FIG. 1. LOCATION OF COOPERATIVE, INDEPENDENT, AND CENTRALIZER CREAMERIES IN MINNESOTA, 1934

Cooperative creameries are well distributed over the state, but are most concentrated in the heavy butterfat production areas in the southeastern and the central sections of the state.

creameries in the Twin City area the principal function of which is to supply city plants with market milk and cream. Cooperative creameries in 13 northern counties were not included in this study. Throughout the remainder of the state creameries were selected somewhat in proportion to the number of cooperative creameries in the various dairy areas. In four different sections of the state all cooperative creameries with

adjoining butterfat supply areas were studied in order to observe the results of competition between creameries.

A large share of the data used in the analysis was obtained in interviews with operators, secretaries, or other officials of the creameries. Nearly all of the associations visited provided copies of their balance sheets and operating statements for the year ending December 31, 1934. This material was supplemented by accounting and statistical reports made monthly and annually to the Minnesota Department of Agriculture, Dairy and Food.

Minnesota's Creamery Industry

Minnesota is the leading state in the production of butter. In 1935 Minnesota creameries produced over 273 million pounds of butter, which represented about 16.7 per cent of the national output. Most of this butter was produced in a broad dairy belt extending across the state in a northwesterly direction from Freeborn County on the southern border through Steele, McLeod, Wright, Stearns, Douglas, Ottertail, and Clay counties (see Fig. 2).

From Table 1 it may be observed that the volume of butter produced in the state more than doubled in the two decades preceding 1935. Although much of this increase was registered in the older dairy areas including Freeborn, Steele, Rice, and Stearns counties, the largest gains were made in Ottertail and Clay counties which showed increases of 6 and 5.4 million pounds, respectively, in the 20-year period. A decrease in butter production occurred in Carver and Ramsey counties because of extensive sales of market milk and cream.

Table 1. Total Pounds of Butter Manufactured by Three Types of Minnesota Creameries, 1915-1935*

Year	All creameries pounds	Cooperative pounds	Independent pounds	Centralizer pounds	Per cent made by cooperatives
1915	126,150,665	76,767,006	17,615,802	31,767,857	60.8
1920	139,229,843	91,716,231	13,484,761	34,028,851	65.8
1925	260,638,627	161,530,035	24,205,124	74,904,468	62.0
1930	283,239,596	188,586,268	34,701,436	59,951,892	66.6
1931	285,109,299	197,676,060	37,849,690	49,583,549	69.3
1932	289,659,080	203,180,471	43,583,070	42,895,539	70.1
1933	299,283,199	208,590,311	40,635,273	50,057,615	69.7
1934	273,837,984	194,663,309	38,711,133	40,463,542	71.1
1935	273,360,306	189,956,215	40,497,567	42,906,524	69.5

* Data compiled from annual reports of Minnesota Department of Agriculture, Dairy and Food.

Table 1 also reveals that the largest proportion of the butter produced in Minnesota has been made by cooperative creameries. In 1915 the cooperatives made 60.8 per cent of all the butter in the state, and by 1935 their production was 69.5 per cent of the total.

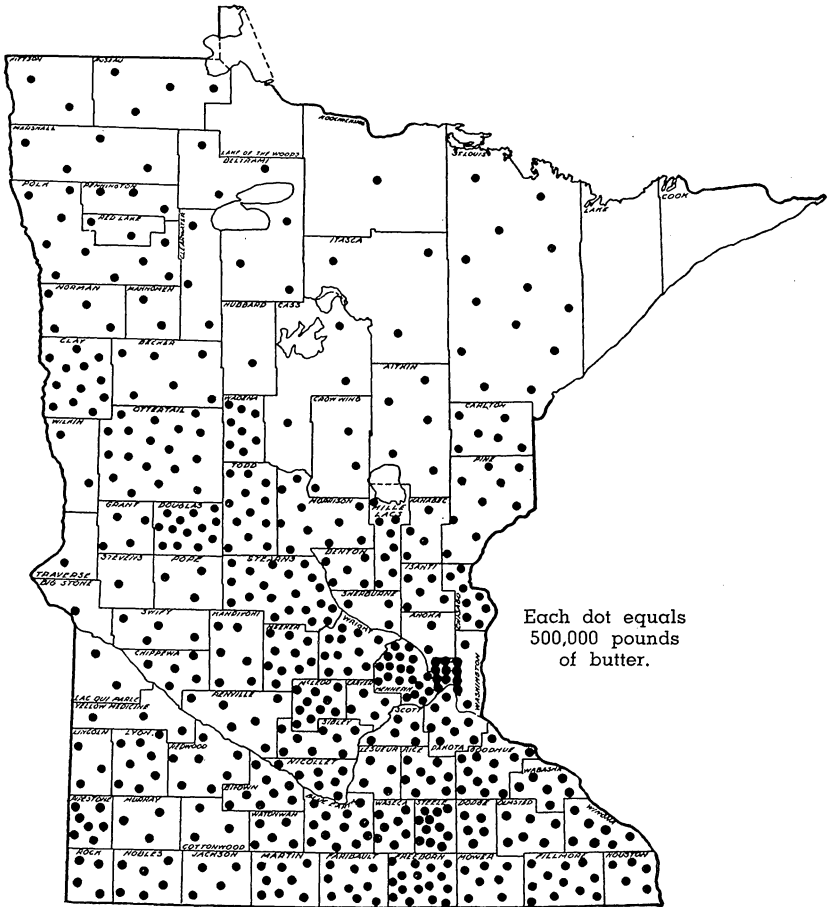


FIG. 2. POUNDS OF BUTTER MANUFACTURED IN MINNESOTA IN 1934

In 1934 Minnesota creameries made approximately 274 million pounds of butter. Most of this butter was produced in a broad dairy belt extending across the state in a north and northwesterly direction from Freeborn County.

Although the butter output of Minnesota's cooperative creameries increased from 76.7 to approximately 190 million pounds between 1915 and 1935, there was an actual decrease in the number of cooperative plants over the same period. According to Table 2, 646, or 75.6 per cent, of Minnesota's 855 creameries were operating on a cooperative basis in 1915. In 1935, 635, or 72.5 per cent, of 876 plants were operated cooperatively. These relationships indicate that there has been a considerable increase in the average output of each cooperative since 1915. As shown in Table 3, the average pounds of butter made by each cooperative creamery increased gradually from 118,834 pounds in 1915 to 326,944 pounds in 1933.

Table 2. Number of Minnesota Creameries Classified by Types, 1915-1935*

Year	Total	Cooperatives	Independents	Centralizers	Per cent of creameries which are cooperative
1915	855	646	174	35	75.6
1920	830	642	144	44	77.4
1925	825	660	119	46	80.0
1930	861	669	154	38	77.7
1931	840	644	158	38	76.7
1932	852	644	170	38	75.6
1933	853	638	182	33	74.8
1934	866	639	196	31	73.8
1935	876	635	207	34	72.5

* Data compiled from annual reports of Minnesota Department of Agriculture, Dairy and Food.

Table 3. Average Pounds of Butter Made by Three Types of Minnesota Creameries, 1915-1935*

Year	All creameries	Cooperative	Independent	Centralizer
	pounds	pounds	pounds	pounds
1915	147,545	118,834	101,240	907,653
1920	167,747	142,860	93,644	773,382
1925	315,926	244,743	203,396	1,628,358
1930	328,966	281,893	225,334	1,557,681
1931	339,416	306,950	239,555	1,304,830
1932	339,975	315,498	256,371	1,128,829
1933	350,860	326,944	223,271	1,516,897
1934	316,210	304,637	197,506	1,305,273
1935	312,055	299,144	195,640	1,261,957

* Data compiled from annual reports of Minnesota Department of Agriculture, Dairy and Food.

In spite of this increase in the average annual output of Minnesota's cooperative creameries, the volume of these plants is small compared with creameries in other states. While the average annual production of Minnesota's 639 cooperatives was 305,000 pounds in 1934, the average annual output of Iowa's 277 cooperative creameries was 465,000 pounds in the same period.² A recent study of 20 California creameries showed the annual production of butter in 1931 to be 1,987,000 pounds for each creamery.³

The quantity of butter manufactured annually by the creameries included in this study varied from 44,992 to 1,668,241 pounds. According to Table 4, the usual production of Minnesota cooperative creameries, on the basis of the 175 plants included in this study, is between 125,000 and 375,000 pounds annually.

² Robotka, Frank, "American Cooperation," 1936, p. 141.

³ Tinley, J. M., and Others, "Creamery Operating Efficiency in California," Giannini Foundation Mimeo. Report No. 41, p. 11.

Table 4. Classification of 175 Minnesota Cooperative Creameries According to Pounds of Butter Manufactured, 1934

Group number	Pounds of butter made	Number of creameries	Per cent of creameries
I	Less than 125,000	9	5.1
II	125,000-249,999	54	30.9
III	250,000-374,999	51	29.1
IV	375,000-499,999	32	18.3
V	500,000-624,999	15	8.6
VI	625,000 and over	14	8.0
Total		175	100.0

ORGANIZATION STRUCTURE AND COOPERATIVE CHARACTER OF CREAMERIES

Great diversity exists in the organization structure and the cooperative character of the creameries included in this study. This is due to a number of factors such as differences in the age of these associations, the laws under which they were incorporated, their by-law provisions, the diligence with which articles and by-laws are enforced, the economic circumstances of butterfat producers, cooperative leadership and education, and experience in cooperation. Still other variations in structure and cooperative character may be explained by the fact that some associations have made rapid adjustments to new cooperative developments, some have done so less rapidly, and others have made no progress or have even experienced retrogression in their cooperative status.

Original Organization and Incorporation

The most significant differences in cooperative performance are often found among the oldest associations. According to Table 5 most of these creameries were organized over 25 years ago, 102 of 163 creameries having been organized before 1910, and only 17 since 1919.

Table 5. Period of Original Organization and First Incorporation of Creameries Surveyed

Year	Original organization*		First incorporation†	
	Number of creameries	Per cent of creameries	Number of creameries	Per cent of creameries
Before 1889	1	0.6		
1890-1899	46	28.2	41	23.8
1900-1909	55	33.8	51	29.7
1910-1919	44	27.0	54	31.4
1920-1929	17	10.4	25	14.5
1930 and after			1	0.6
Total	163	100.0	172	100.0

* Based on information from 163 creameries.

† Based on information from 172 creameries.

Of 172 creameries from which original organization information was available, 33 began operations as independent creameries on an individual proprietorship or stock company basis and were later purchased by the present cooperative association. Six creameries began business as unincorporated associations, while 133 were cooperatives from the beginning. The period in which these creameries were first incorporated as cooperatives is shown in the second part of Table 5.

Legal Basis of Organization

Provision was made in the laws of Minnesota for the incorporation of cooperatives as early as 1870. The law was changed from time to time, and consequently these creameries have been incorporated under various provisions. Chapter 382, Laws of 1919, and Chapter 326, Laws of 1923, are the acts under which more recent associations have been formed. These laws under which many older associations are now being reorganized or reincorporated (see second part of Table 6) include among other provisions the following: The purposes for which a cooperative may be established; the procedure to be followed in organizing a cooperative; the regulation of administrative officers in cooperatives, and a statement of the characteristics essential to a Minnesota cooperative association.

These specified characteristics embody some of the basic Rochdale cooperative principles. They provide in part that:

- (1) The ownership of capital stock by any individual stockholder shall not exceed the par value of \$1,000.
- (2) Individual stockholders shall be restricted to only one vote in the affairs of the association. Proxy voting is prohibited.
- (3) Shares of stock are transferable only with the approval of the governing board of the association.
- (4) Dividends on stock shall not exceed eight per cent. (In 1933 this was changed to six per cent.)
- (5) The net income of the association, except certain amounts required for a reserve fund or permanent surplus or set aside by the vote of stockholders, shall be distributed on the basis of patronage.

These laws also include provisions for the formation of non-stock associations, provisions preventing the use of association funds for promotion expense, and a number of sections covering association meetings, annual reports, and other organization problems.

Table 6 shows that 158, or 91.9 per cent, of 172 creameries were first incorporated under the earlier cooperative laws. Only 14 of the creameries were originally incorporated under the cooperative laws of 1919 and 1923. It is to be observed, however, that 40 associations have taken advantage of the more recent laws, as their original charters expired, or as some other reason for a change developed (see second part

of Table 6.) As a result of these shifts from prior laws, there were 54 creameries incorporated under the laws of 1919 and 1923, or 31 per cent of the total. One hundred eighteen associations still remain under earlier laws, undoubtedly because they have thus far been able to accomplish their cooperative purposes under these laws without difficulty. Some have reorganized in order to qualify for federal cooperative loans or federal income tax exemption.

Table 6. Classification of 172 Creameries According to Laws under Which Originally Incorporated and 1934 Incorporation Status

Law	Original incorporation		1934 incorporation status	
	Number of creameries	Per cent of creameries	Number of creameries	Per cent of creameries
Early cooperative laws	158	91.9	118	68.6
Cooperative law of 1919 (Chap. 382)	9	5.2	16	9.3
Cooperative law of 1923 (Chap. 326)	5	2.9	38	22.1
Total	172	100.0	172	100.0

Conformity to Cooperative Specifications of State Law

In view of the many differences in the organization and incorporation of these creameries, it is of interest to note to what extent their cooperative features conform to certain minimum specifications of the state cooperative laws (Table 7).

Table 7. Conformity of 175 Creameries to Certain Minimum Specifications of the State Cooperative Laws, 1934

Cooperative specification	Number of creameries	Per cent of 175 creameries	Per cent of 164 capital stock creameries*
One-man-one-vote	175	100.0	100.0
Limit on stock held per member.....	114	65.1	69.5
Limit on dividends on stock	159	90.9	97.0
Patronage dividends	36	20.6	22.0

* Eleven creameries had no outstanding stock.

All creameries limited each member to one vote. Proxy voting was prohibited in 137 of the associations. One hundred fourteen of the associations limited the amount of stock held by an individual below the \$1,000 now specified in the cooperative laws. Although the limitation was expressed in many ways, all but 19 creameries kept the amount below \$600 for each member.

Of the creameries having outstanding capital stock, 159, or 97 per cent, kept the rate of dividends paid on stock below the 8 per cent provided in the laws. Since 1929 only 117 of 164 creameries, or 71 per cent, had paid dividends. Many of the rest had never paid a dividend.

Even though many of the associations included the patronage dividend feature in their by-laws, only 36, or 20.6 per cent of these 175

creameries, had ever paid their patrons such a dividend. According to Table 8, 23 of the creameries paid patronage dividends on butterfat in 1934. The amounts ranged from one-fourth of a cent a pound in four creameries to one and one-half cents in two other associations. Non-

Table 8. Patronage Dividends Paid on Butterfat by 23 Creameries in 1934

Cents paid per pound butterfat	Number of creameries	Per cent of 175 creameries	Per cent of 23 creameries paying dividend
0.25	4	2.3	17.4
0.33 $\frac{1}{4}$	2	1.1	8.7
0.50	8	4.6	34.7
0.70	1	0.6	4.4
0.75	1	0.6	4.4
1.00	5	2.8	21.7
1.50	2	1.1	8.7
	--	--	--
Total	23	13.1	100.0

members were also paid these dividends in all cases, but in 11 instances it was applied toward the purchase of stock in the association. Since most creameries tend to pay patrons practically all available proceeds at the end of each pool period, little net income remains in the average case for distribution in the form of patronage dividends at the end of the year. Within the last five years, however, there has been a renewed interest in the patronage dividend principle. Several creameries reported adopting it recently as a method of attracting new patrons, and with considerable success.⁴

Only six creameries were organized under the non-stock provision of the cooperative law. These associations require all patrons to pay membership fees ranging from 50 cents to one dollar. The five other creameries without stock outstanding had the authority to issue stock, but three of the latter had never issued any, while two had previously retired all capital stock.

Conformity to Federal Cooperative Specifications

In order to obtain exemption from federal income taxes or to qualify for loans from the St. Paul Bank for Cooperatives, the association must at least conform to the cooperative requirements outlined in the Federal Capper-Volstead Act.⁵ Associations organized and operating in accordance with the provisions of the state law meet both the first and second requirements of the Capper-Volstead Act, that voting be based on membership or that dividends be limited to eight per cent. It is now of interest to observe how well these associations have met the additional requirements of the Act, namely, that they shall be associations of agri-

⁴ See page 43.

⁵ A summary of specific requirements to be observed in order to obtain federal tax exemption or a federal loan is presented in Appendix A and B.

cultural producers,⁶ and that the business transacted with non-members shall not be greater in value than that handled by it for members.

Membership of Cooperative Creameries

The total membership of the 175 creameries amounted to 22,948, or an average of 131 members for each association. Membership varied from 27 members in the smallest association to 409 in the largest. More creameries had from 75 to 124 members than any other number. Twenty per cent of the creameries had fewer than 75 members, and only 1.7 per cent had 325 or more.

Although the number of members in each of these associations is important to their welfare, it is more important from the standpoint of conformity to federal cooperative specifications that these members are properly distributed between producers and non-producers and between patrons and non-patrons. Producer and patron representation in cooperative organizations must be large enough to insure that operations will be conducted for the benefit of patrons. Of the total 22,948 members in these creameries, 19,514, or 85 per cent, were farmers or producer members. According to Table 9 only 78 creameries reported that 90 per cent or more of their members were agricultural producers. Thus, only this limited group of creameries met the important specification in the Capper-Volstead Act with respect to producer membership.

Table 9. Classification of 175 Creameries According to Proportion of Members Who Were Producers and Patrons, 1934

Per cent	Number of creameries in which specified per cent of members are producers	Number of creameries in which specified per cent of members are patrons
Less than 30	1	3
30-39	1	1
40-49	2	9
50-59	5	13
60-69	11	12
70-79	23	33
80-89	54	52
90-99	46	31
100	32	21
Total	175	175
	per cent	per cent
Average	85	80

Because some members deliver their cream elsewhere than to their own creamery, the number of patron members is less than of producer members. Only 52 associations have 90 per cent or more patron members. The average percentage of patron members in these 175 associations is 80 per cent. This is sufficiently high to assure patrons of a

⁶ In the administration of the Act, associations with as many as 10 per cent non-producers have been regarded as coming within its scope.

working majority in the control of the association. It should be observed, however, that in 13 associations the voting control is in the hands of non-patrons (see Table 9). In one extreme case only 13 per cent of the members were patrons. The difficulties which associations such as this confront are obvious. Drastic reorganization will be necessary to return this association to a cooperative basis.

Another problem closely related to the one just considered is what proportion of the patrons of these associations are members? Of the 34,799 patrons in these 175 creameries, only 18,416, or 52.9 per cent, were active members. In 77 associations less than half and in five associations less than 20 per cent of the patrons were members. Such conditions represent a great divergence from the cooperative ideal of giving every patron a voice in his association.

Adjustments to improve patron membership.—Creamery associations often fail to maintain the cooperative character of their organizations because they neglect keeping membership in the hands of patrons. This situation has generally arisen because no particular thought or effort has been given (1) to making members of patrons, (2) to transferring, or (3) to terminating the membership of those who are no longer patrons.

MAKING MEMBERS OF PATRONS.—As a rule these creameries were not aggressive in obtaining new members from the ranks of their patrons. In 101, or 57.7 per cent, of the creameries no new members were enrolled in 1934. The creameries which did enroll new members added relatively few, the largest increase being 28 in one association. In 63 of the associations from one to ten members were added in 1934.

These creameries followed distinctly contrasting membership policies. A large proportion of creameries indicated that they did not wish to add new members because they had no need for more capital, and they did not wish to increase the dividend burden of the association. In many cases the management did not consider the advantage of having as members a large proportion of its patrons. Creameries which wished to increase their membership often found that patrons lacked the necessary capital; that the par value of shares was too high; that patrons were reluctant to buy because the financial condition of the company was poor and no dividends were being paid, and that often shares were difficult to obtain because non-producers refused to transfer their holdings.

Only 37 of the creameries had a definite program of making members of their patrons. In 14 associations butterfat deductions from new patron accounts were applied toward the purchase of a share of stock. Six of the creameries which were paying patronage dividends applied non-member dividends on capital stock accounts. Six other creameries gave their patrons a share of stock after a specified amount of butterfat had been delivered. In 11 creameries organized without capital stock or with no stock outstanding, patrons who began delivering butterfat were automatically considered to be members or were enrolled as members after paying a small membership fee.

In recent years many associations have reduced the par value of their capital stock in order to encourage patron membership, six doing so in 1934. Low par shares are especially helpful in increasing patron memberships in periods of low farm incomes and in communities in which tenancy is common. The relationship between the par value of shares and the proportion of patrons who are members is shown in Table 10. This table reveals that the proportion of patrons who are members is as high as 65 per cent in the associations in which the par value of shares is below \$10. In contrast, in associations with par values as high as \$75 and \$100, only 40 per cent of the patrons were members.

Table 10. Relationship between Par Value of Stock and the Proportion of Patrons Who Are Members in 164 Creameries, 1934

Par value of stock	Number of creameries	Per cent of patrons who are members
Less than \$10	18	65.1
10-24	54	48.0
25	57	49.3
50	24	50.1
75 and 100	11	40.7
Total	164*	49.9

* Eleven creameries had no stock outstanding.

TRANSFER AND TERMINATION OF MEMBERSHIP.—In many associations patron membership has been relatively small because no definite provision has been made to transfer or terminate the membership of those who cease patronizing the creamery. In 24 of the 164 associations with capital stock outstanding there were no by-law provisions covering the transfer of stock, which gave the creamery virtually no control in guiding the stock into properly qualified hands. In 131 associations members were required to offer their shares to the association before they could be sold to anyone else. Seventy-three of these had the additional provision that if the creamery did not buy the stock within 30 days, the member could sell to anyone eligible for membership.

When stock was offered for sale by retiring members, 113 out of 164 associations adhered to the policy of repurchasing it. Fifty-one creameries were unwilling to purchase stock offered for sale or were unable to do so because of their weak financial condition. In such cases the stock often was sold to non-patrons in the community, such as merchants, bankers, and retired farmers.

More frequently the retiring patron was unwilling to sell the stock he held because of the excellent investment it afforded. To control a situation such as this the association must have the power to terminate membership. One hundred six, or 60.6 per cent, of these creameries had such powers under specified conditions, but 39.4 per cent had no legal way to do so against the will of their members. The three most common

bases for membership termination were: (1) Failure to deliver butterfat, (2) violation of creamery by-laws, and (3) removal from the community.

It was observed that many creameries which had the powers of termination in their by-laws were often lax in applying them to patrons retiring from farming. The management often felt it was unjust to terminate the membership of those who had assisted in financing the organization in more difficult times.

Proportion of Business Done with Members

A much larger proportion of the creameries studied conformed to the second section of the Capper-Volstead Act which requires that "the association shall not deal in the products of non-members to an amount greater in value than such as are handled by it for members." This is indicated by the fact that in 132 of the 171 creameries reporting, over 50 per cent of the total business was transacted with member patrons. Only 39, or 22.8 per cent, of the creameries did more than 50 per cent of their business with non-members, failing in this respect to qualify as cooperative associations under the federal law.

Cooperative Status Reflected by Tax Exemption

Some indication as to how well these associations have conformed to the minimum cooperative standards established in the federal law and regulations is shown by the number of associations which have actually been exempted from income tax and capital stock tax payments. One hundred of the 174 creameries reporting, or 57.5 per cent, made no income tax payments because they had been granted exemptions as cooperatives. During 1934, 49 other associations paid no income tax because they lacked net earnings. Twenty-five associations were paying the tax indicating that their cooperative status was such as to preclude exemption for the present.

The number paying the federal capital stock tax is another indicator. All associations not specifically tax exempt must pay this tax, even though they have no net earnings. In 1934, 55 of 175 associations, or 31.4 per cent, paid this tax. One hundred twenty creameries indicated no capital stock tax payments. Thus, approximately one third of the creameries surveyed lacked sufficient cooperative features to meet federal specifications for cooperative associations.

Delegation of Managerial Authority

Practically all associations specified in their by-laws that directors must be producer-members of the creamery. However, a large number of organizations made exceptions to this rule in the case of the secretary-treasurer or treasurer in order to obtain the services of business men experienced in matters of accounting and finance.

The size of the boards of directors of these creameries varied from three to ten members. The most usual size of the board is seven members, this being the number in 65 per cent of the associations. Thirty-four creameries had five directors.

The length of the term which directors served varied from one to four years. Sixty-two creameries elected the entire board annually; 27 had a two-year term; 74 a three-year term, and 12 had terms of varying length for each director, ranging from one to four years. Most associations stagger the terms of board memberships in order to have experienced men on the board at all times.

As a rule the officers of the association were elected by the board from their own number. This was the case in 120 creameries. In 55 creameries officers were elected at the annual meetings by the members of the organization.

In most associations the board of directors met at least once each month, generally to determine butterfat prices to be paid producers and to decide on matters of management not delegated to the operator. In all but 17 associations the plant manager met with the board at its regular meeting.

The authority delegated to the plant managers or operators varies considerably. In many associations practically all the duties of management fall on the operator. In certain areas of the state, especially the northwestern and central western parts, the operators not only supervise the manufacturing operations but also take charge of many of the business details of the association. In the older creamery areas of the state, particularly the southeastern part, the operator is generally responsible for only the buttermaking operations. The secretaries in this area assume a large share of the responsibilities of management, especially those connected with the business affairs of the organization.

Since important powers of management must be delegated by members of these associations to others, it is imperative that a system of records and reports be used to keep members informed on the more important phases of their business. In 141 associations members and patrons received printed annual reports of the creamery operations.⁷ In 34 associations the annual reports were only read at the annual meeting and not printed. This method is very inadequate because it does not give members of the association time to study and evaluate the business as they should.

Suggestions for Improving the Cooperative Character of Creameries

Creamery associations desiring to strengthen the cooperative features of their organization may find the following suggestions helpful:

1. Associations formed under earlier laws may consider reorganizing under present cooperative laws and adopting new articles of incor-

⁷ Further discussion of creamery records is given on p. 60.

poration and by-laws providing for better observance of cooperative principles. This applies especially to associations whose present charters are expiring.

2. Definite plans should be made and followed for keeping ownership of stock or membership as nearly as possible in the hands of patrons.

3. Patrons should be encouraged to become members, and membership should be made as easy to acquire as possible. Low par value of shares, application of patronage dividends to the purchase of shares, and easy payment plans will serve this end. Provision should be made for the termination of memberships through the repurchase of stock or other means in cases where the holder no longer is a patron.

4. Attention should be given to educational work to interest farmers and to acquaint them with the operations and services of the organization.

FINANCING OF COOPERATIVE CREAMERIES

If cooperative creameries are to obtain sufficient capital at reasonable rates and without restricting normal manufacturing and marketing operations, considerable attention must be devoted to the problem of proper financing. This involves (1) keeping the amount of capital required in line with the needs of the organization, (2) obtaining capital from sources and by methods consistent with the cooperative aims of the association, and (3) maintaining a proper relationship between the various capital requirements and sources. In order to obtain a more complete understanding of the present financing of these creameries, it is important to consider briefly some phases of their original financing.

Original Capital Requirements and Sources

The original capital requirements of Minnesota cooperative creameries were small compared with present-day standards. The first creamery buildings were generally low-cost frame structures and were provided with relatively few pieces of simple equipment. An examination of the original ledger records of creameries organized before 1914 showed that on the average these fixed capital requirements amounted to approximately \$3,000. Operating capital requirements also were small due to the fact that the product was generally made and sold on patron credit.

Most of the capital needed to finance the first requirements of these creameries was obtained by the sale of capital stock to patrons and other interested parties in the community. Of 153 creameries, 119 obtained all or part of their funds in this way (see Table 11). The remainder of the capital originally required was obtained through various forms of borrowing. Forty-four out of 153 creameries obtained all of their original capital in this way, while 81 financed part of their requirements on a credit basis. Of the creameries which borrowed all or a part of their original capital, 58 borrowed on the notes of the association endorsed by officers, directors, or other interested members. In 41 cases

funds were borrowed on the basis of collateral notes usually secured by the deposit of member demand notes. The various forms of notes issued were generally taken by the banks or local investors at rates varying from six to eight per cent. In creameries organized after 1905, mortgages on the plant were used more frequently in obtaining original capital. Creamery equipment houses quite often extended credit to creameries on the basis of installment loans.

Table 11. Method of Obtaining Original Capital Used by 153 Creameries Classified According to Period of Financing

Period of financing	Total number of creameries financed	Number selling stock	Number borrowing on collateral notes	Number borrowing on endorsed notes	Number borrowing on mortgages	Number borrowing by other methods
1890-1894.....	16	9	4	6	.....	1
1895-1899.....	21	13	8	5	1	.....
1900-1904.....	16	12	3	3	.....	2
1905-1909.....	28	27	7	13	2	1
1910-1914.....	25	18	7	11	2	3
1915-1919.....	26	22	8	12	3	1
1920-1924.....	16	13	4	6	4	2
1925-1930.....	5	5	.....	2	4	.....
Total.....	153*	119	41	58	16	10

* The "total number of creameries financed" is less than the total using the various methods of obtaining capital because some creameries used two or more methods of financing.

Debt Repayments and Butterfat Deductions

The debts of these creameries were generally liquidated out of earnings and butterfat deductions varying from a fraction of a cent to two cents a pound. Most creameries issued capital stock to those who signed notes to help finance the association and repaid these notes with butterfat deductions. Other creameries issued stock to all producers who delivered butterfat while the debt was being liquidated. In 9 creameries which had borrowed capital on patron credit no stock was ever issued to anyone, the association being continued on a "mutual" basis, every patron being considered a voting member.

Virtually all creameries discontinued crediting patrons with the value of their butterfat deductions after a share of stock had once been issued to them. As a result, most cooperative creameries have built up large permanent surpluses on the basis of these unallocated deductions (see Fig. 4). Since surpluses legally belong to the stockholders, and since patrons do not hold stock in proportion to their patronage, some patrons are penalized by the butterfat deduction method of financing.

In recent years in belated fairness to patrons and in order to secure and hold a tax exempt status, some creameries have capitalized their surplus by issuing stock to patrons to cover butterfat deductions. More recently some creameries which have not favored issuing more dividend-bearing capital stock have capitalized their surplus by issuing non-

interest bearing "equity reserve certificates" to patrons in proportion to their share in surplus. These certificates are to be repurchased from the patron at full value when he ceases to be a butterfat producer.

Present Capital Requirements

The capital required for both fixed and operating capital purposes has increased greatly during the lifetime of the average Minnesota cooperative creamery. The total net capital invested in 146 cooperative creamery plants in 1934 amounted to \$3,829,459. The total capital requirements of individual plants varied from \$4,000 to \$85,000, the most usual amounts ranging from \$10,000 to \$25,000 (Table 12). Twelve associations showed total assets in excess of \$50,000. According to Table 13, the average amount of capital required by 146 creameries was slightly over \$26,000.

Table 12. Classification of 146 Minnesota Cooperative Creameries According to Amount of Total Assets, 1934

Total assets	Number of creameries	Percentage of total creameries
Less than \$5,000.....	2	1.4
5,000- 9,999	11	7.5
10,000-14,999	26	17.8
15,000-19,999	17	11.7
20,000-24,999	26	17.8
25,000-29,999	17	11.7
30,000-34,999	12	8.2
35,000-39,999	7	4.8
40,000-44,999	11	7.5
45,000-49,999	5	3.4
50,000 and over.....	12	8.2
Total	146	100.0

One of the more important factors influencing the amount of capital required by a creamery is its volume of business. Table 13 shows that as the output increased from less than 125,000 pounds annually to more

Table 13. Relation between Volume of Output and the Total Amount of Capital Required in 146 Minnesota Cooperative Creameries, 1934

Pounds butter made	Number of creameries	Total Assets	
		Average	Range
Less than 125,000.....	9	\$ 8,644	\$ 4,206-12,238
125,000-249,999	44	17,063	6,189-35,000
250,000-374,999	39	24,528	7,845-52,197
375,000-499,999	26	32,512	15,083-45,846
500,000-624,999	14	33,681	11,810-55,147
625,000 and over.....	14	51,961	19,708-85,344
All creameries	146	\$26,229	\$ 4,206-85,344

Table 14. Asset Values of 146 Minnesota Cooperative Creamery Associations as of December 31, 1934

	Total value	Average value	Per cent of total value
<i>Current Assets</i>			
Cash	\$ 330,438.92	\$ 2,263.28	8.6
Accounts Receivable—Patrons	85,620.52	586.44	2.3
Accounts Receivable—General	372,411.95	2,550.77	9.7
Butter Inventory	92,958.37	636.70	2.4
Other Products Inventory	61,877.22	423.82	1.6
Supplies Inventory	134,544.87	921.54	3.5
Prepaid Expense	11,314.45	77.49	0.3
Total Current Assets	\$1,089,166.30	\$ 7,460.04	28.4
<i>Investments Assets</i>			
Certificates of Indebtedness	\$ 202,561.89	\$ 1,387.41	5.3
Stocks, Bonds, etc.	28,058.53	192.18	0.7
Total Investment Assets	\$ 230,620.42	\$ 1,579.59	6.0
<i>Fixed Assets</i>			
Land	\$ 146,973.35	\$ 1,006.67	3.8
Buildings	\$1,947,249.66	\$13,337.33	
Reserve for Depreciation Buildings	405,375.64	2,776.55	
Buildings (Net)	1,541,874.02	10,560.78	40.3
Machinery and Equipment	\$1,311,145.09	\$ 8,980.45	
Reserve for Depreciation M. and E.	601,263.94	4,118.25	
Machinery and Equipment (Net).....	709,881.15	4,862.20	18.5
Office Equipment	\$ 35,987.28	\$ 246.49	
Reserve for Depreciation O. E.	17,440.69	119.46	
Office Equipment (Net)	18,546.59	127.03	0.5
Trucks and Delivery Equipment.....	\$ 15,807.14	\$ 108.27	
Reserve for Depcn. T. and D. E.	5,330.08	36.51	
Trucks and D. E. (Net).....	10,477.06	71.76	0.3
Total Fixed Assets	\$2,427,752.17	\$16,628.44	63.4
<i>Other Assets</i>			
Cash in Closed Banks.....	\$ 80,022.73	\$ 548.10	2.1
Other Miscellaneous	1,897.54	13.00	0.1
Total Other Assets	\$ 81,920.27	\$ 561.10	2.2
Total All Assets	\$3,829,459.16	\$26,229.17	100.0

than 625,000 pounds, the total capital increased from \$8,600 to approximately \$52,000. The last column of this table shows the wide variations in the amount of capital required by creameries of similar volume.

Buildings.—Of the total capital required by creameries, an average of 63.4 per cent (Table 14) was used for fixed assets in the form of land, buildings, and equipment. Buildings at their net or depreciated value constituted 40 per cent of all assets (see Fig. 3). Table 15 shows that the main building of 119 out of 173 creameries was of brick or brick and tile construction, while in 35 creameries it was of frame construction. The original value of these buildings varied from \$1,000 for a 30-year-old frame building to \$45,000 for a new brick building. Most

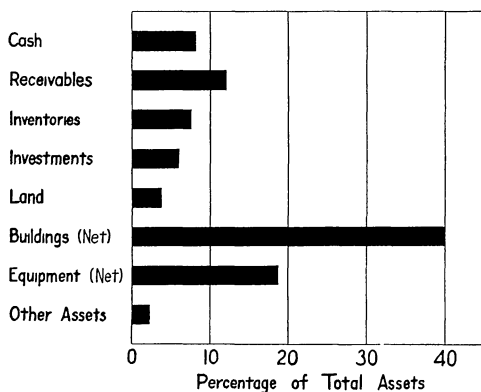


FIG. 3. PERCENTAGE DISTRIBUTION OF THE ASSETS OF 146 CREAMERY ASSOCIATIONS AS OF DECEMBER 31, 1934

Buildings at their net or depreciated value constituted 40 per cent of all the assets of these creameries. Machinery and equipment represented 18.5 per cent of all the assets.

built with the consequent result of poor plant utilization and higher operating cost (see p. 59).

of the buildings originally cost from \$5,000 to \$15,000. Seven buildings were constructed at a cost exceeding \$35,000. The average cost of the buildings of brick construction was \$15,418 as against \$3,632 for those of frame construction. The new buildings which have been constructed have been larger and more costly than those which they have replaced. Although it is well that new buildings are constructed so they can accommodate anticipated increase in volume, many associations have evidently over-

Table 15. Classification of 173 Minnesota Cooperative Creameries According to Type and Original Cost of Construction, 1934

Types of construction	All build-ings	Original cost of construction					Average of all	Average size
		Less than \$5,000	\$5,000 to \$14,999	\$15,000 to \$24,999	\$25,000 to \$34,999	More than \$35,000		
		Number of creameries						sq. ft.
Brick*	119	11	57	31	15	5	\$15,418	2,973
Frame	35	25	10	0	0	0	3,632	1,807
Tile	12	4	6	1	0	1	9,600	1,459
Cement block	7	0	6	0	0	1	14,470	2,929
Total	173	40	79	32	15	7	\$12,523	2,697

* Includes brick and tile structures.

These creameries showed considerable variation in the total provisions which they made for the depreciation of buildings. According to Table 16, 16 creameries showed no reserve for the depreciation of buildings. Most of the 32 creameries showing reserves of less than 10 per cent of the original value had evidently not made an adequate provision for this purpose in view of the age of their buildings. Two creameries with reserves over 90 per cent of the original value had evidently over-depreciated in view of the fact that their buildings were still serviceable.

Table 16. Total Provision Made for Reserve for Depreciation on the Balance Sheets of 175 Minnesota Cooperative Creameries as of December 31, 1934

Per cent reserve is of original cost	Buildings	Machinery and equipment	Office equipment
	Number of creameries		
No reserve	16	16	9
0- 9.9	32	9	7
10.0-19.9	29	26	21
20.0-29.9	38	15	8
30.0-39.9	26	13	6
40.0-49.9	12	20	6
50.0-59.9	11	24	12
60.0-69.9	4	18	11
70.0-79.9	2	12	8
80.0-89.9	1	7	5
90.0-99.9	1	4	5
100.0	1	2	2
No report	2	9	75
Total	175	175	175

With so much misunderstanding concerning the significance of the depreciation reserve account, it must be emphasized that it is a valuation account used to maintain the value of the capital invested in fixed assets. If the reserve is to serve the function of protecting the assets against dissipation, the offsetting funds should be used only to finance current or fixed assets, to reduce existing liabilities, to retire capital, or to set up a special depreciation fund. This fund may be invested in interest-bearing securities and may be used to finance replacements as they are needed. Many creameries are making the error of using the funds, supposedly protected by the depreciation reserve, to make butterfat payments. This represents a liquidation of the investment. It is not an equitable liquidation because some patrons may receive more or less than they originally contributed to the investment. In such a case, when replacements are needed the association will be forced to borrow or sell more stock.

Equipment.—The net depreciated value of the equipment of 146 creameries constituted 19.3 per cent of the total capital required (Table 14). Virtually all of the equipment, 18.5 per cent of the total assets, was used in the direct manufacturing operations, and only a small amount was used for office and trucking purposes. The depreciated value of the equipment of the largest group of plants ranged from \$3,000 to \$4,500. The 1934 value of equipment ranged upward to \$18,360 for one plant.

In general, these creameries had devoted more attention to providing a reserve for the depreciation of machinery than for that of buildings. A large group of plants, 76 in all, had provided reserves amounting to over 50 per cent of the original value. Six had reserves in excess of 90 per cent, which is probably excessive in view of the condition of the equipment.

Creamery site.—Only 3.8 per cent of the capital of these 146

creameries was invested in land (Table 14). The average value of the creamery site in 146 associations was approximately \$1,000. Capital invested in sites varied from nothing in creameries holding land on a long-term-lease basis to \$7,500 for a plant located on a very desirable city lot. The land held by creameries located in the larger villages and cities was valued at \$1,250 on the average, while 27 inland creameries had only \$300 invested in this way.

Investment and other assets.—Slightly over six per cent of the capital of the 146 creameries supplying complete balance-sheet information was invested in other organizations (Table 14). The largest share of this investment was represented by the certificates of indebtedness of a cooperative sales agency being held by member creameries. Small amounts were invested in the stock of a cooperative sales agency, in the stock of other local cooperatives, and in a few cases in securities of a purely investment character.

Other assets of a fixed nature were represented mainly by cash in closed banks. In most cases this item was being reduced by dividends and periodic write-offs.

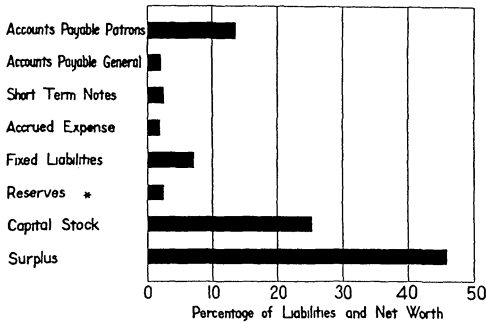
Operating capital requirements.—The operating capital of these creameries, including cash, receivables, and inventories, represented 28.4 per cent of the total capital requirements (Table 14), or \$7,460 per creamery. The more important current asset items were cash and accounts receivable. General accounts receivable, which comprised 9.7 per cent of the total investment, included amounts due from local retailers and agencies to which butter is shipped. Prompt payments by butter houses and advances taken against butter shipped have tended to reduce the amount of capital required for this purpose. Most creamery managers indicated that the proportion of uncollectible accounts was very small.

Accounts receivable from patrons required relatively little operating capital. This account could be kept at a low figure because it was generally cancelled before making payments to patrons at the end of each pool period. Some creameries handling a large sideline business had granted some farmers more credit than could be offset against their butterfat deliveries, with the result that their receivables were a considerable burden and were likely to result in some losses.

Not much capital was required to carry creamery inventories. With butter shipments being made once or twice a week, no large amounts of butter were being held in storage. The largest inventories were held by creameries with a large sideline business calling for a large stock of goods to satisfy patron requirements.

Present Sources of Capital

Of the total capital of these creameries, \$6,933, or 26.4 per cent, was provided by creditors and \$19,297, or 73.6 per cent, by the members of the associations (see Table 17). Over half of the liabilities, or 13.6 per



* Net worth reserves.

FIG. 4. PERCENTAGE DISTRIBUTION OF THE LIABILITIES AND NET WORTH OF 146 CREAMERY ASSOCIATIONS AS OF DECEMBER 31, 1934

Members and patrons provided an average of 87.2 per cent of the capital of these associations, including 46 per cent provided by surplus accumulations.

per creamery was owed on accrued expense items, mainly taxes and wages which were not yet payable.

cent of the total capital provided, represented amounts owed patrons on account for butterfat (see Fig. 4). Since most of the patrons are also members of the association, this amount can in a sense also be considered as capital provided by members and patrons to \$22,850 per creamery, or 87.2 per cent of all assets. Only a small portion of the total capital, 1.9 per cent, was obtained on open account from general creditors. About \$454

Table 17. Liability and Net Worth Values of 146 Minnesota Cooperative Creamery Associations as of December 31, 1934

	Total value	Average value	Per cent of total value
<i>Current Liabilities</i>			
Accounts Payable—Patrons	\$ 518,865.83	\$ 3,553.88	13.6
Accounts Payable—General	73,270.89	501.85	1.9
Short-Term Notes Payable	87,478.97	599.17	2.3
Accrued Expenses	66,263.26	453.86	1.7
Total Current Liabilities	\$ 745,878.95	\$ 5,108.76	19.5
<i>Fixed Liabilities</i>			
Mortgages, Bonds and Long-Term Notes Payable	\$ 266,279.97	\$ 1,823.83	6.9
Total Liabilities	\$1,012,158.92	\$ 6,932.59	26.4
<i>Net Worth</i>			
Reserves	\$ 89,514.03	613.11	2.3
Capital Stock Issued	\$1,138,911.92	\$7,800.76	
Less: Treasury Stock	171,820.50	1,176.85	
Capital Stock Outstanding	967,091.42	6,623.91	25.3
Surplus	1,691,024.18	11,582.36	44.2
1934 Earnings	69,670.61	477.20	1.8
Total Net Worth	\$2,817,300.24	\$19,296.58	73.6
Total Liabilities and Net Worth	\$3,829,459.16	\$26,229.17	100.0

Formal borrowing.—This group of creameries obtained very little capital on the basis of written promises to pay such as short-term notes, mortgages, and bonds. Slightly over two per cent was secured by the use of short-term paper and nearly seven per cent through longer-term paper (see Table 17 and Fig. 4). It will be observed from Table 18 that out of 175 creameries surveyed, only 70 were in debt. Table 18 also reveals that most of the borrowed capital was provided by private parties, usually patrons or other members of the community having funds for investment. Local banks provided a total of \$50,636 of short-term capital to 21 creameries and approximately \$98,000 of longer-term capital to 15 plants. The St. Paul Bank for Cooperatives had provided \$43,000 of capital to five of the creameries surveyed.

Table 18. Indebtedness of 70 Minnesota Cooperative Creameries as of December 31, 1934

Source of funds borrowed	Number of creameries borrowing	Amount borrowed		Interest on borrowing		
		Original	Balance as of Dec. 31, 1934	Average rate	Range	
				per cent	per cent	per cent
<i>Short-term borrowing:</i>						
Local bank	21	\$ 50,636.18	\$ 31,083.17	6.5	8	5
Private party	16	64,436.51	50,486.51	5.2	7	3
Other	2	6,009.29	5,909.29	6.0	6	6
Total short-term	38*	\$121,081.98	\$ 87,478.97	5.7	8	3
<i>Long-term borrowing:</i>						
Local bank	15	\$ 97,950.00	\$ 69,589.96	5.9	8	5
Private party	19	178,776.74	125,926.75	5.0	6	4
Bank for Cooperatives.....	5	43,200.00	34,006.96	4.1	4.5	3
Other	8	60,000.00	51,997.26	5.0	6	4
Total long-term	43*	\$379,926.74	\$281,520.93	5.1	8	3
Total all borrowing.....	70*	\$501,008.72	\$368,999.90	5.3	8	3

* This total is not an addition of the preceding parts because some creameries borrow from two or more sources.

A large proportion of the loans included provisions for serial repayments or payments in amounts the creameries desired at specified interest dates. As a result, the original value of the active loans amounting to approximately \$500,000 had been reduced to a balance of \$369,000 on December 31, 1934 (Table 18). Creameries having loans from the Bank for Cooperatives repaid a certain amount each month based on a percentage of sales.

Most of the long-term borrowing was for the construction of new buildings. Short-term loans were most frequently for the purchase of churns, artificial refrigeration units, or other equipment. Some creameries found it necessary to borrow for short periods in the peak production season in order to meet their scheduled butterfat payments.

Capital provided by members.—Figure 4 shows clearly that members have furnished the largest proportion of the capital of these associations through the purchase of capital stock and the creation of surplus and net worth reserves. According to Table 17 these items which comprise the total net worth amount to more than \$19,000 per association on the average. The net worth of individual associations varies from a low of \$935 to a high of \$72,753, the most usual range being from \$15,000 to \$20,000.

Surplus and current period earnings provided 46 per cent of the capital of these associations, or approximately \$12,000. The surplus of individual creameries varied considerably from this average, one association showing a surplus of \$54,000 while four associations showed balance sheet deficits. The proportion of the total capital provided by surplus varies with the type of organization, method of financing, rate of debt retirement, competition, and other factors. Associations organized on the non-stock basis show the largest surpluses, in some cases ranging upward to 75 per cent of all capital provided. As has been indicated previously, the surpluses of these organizations and those of many stock companies are unusually large because butterfat deductions have not been allocated to the credit of individual patrons. Because of competition and poor management other associations have had their surpluses reduced to the zero point.

Slightly over 25 per cent of the present capital, or an average of \$6,600 per association, was obtained from the sale of capital stock or other forms of membership capital (Table 17). In nearly half of the creameries, 80, the value of stock outstanding amounted to \$2,000 to \$6,000. Eleven creameries reported no stock outstanding while eight showed over \$18,000. A few creameries obtained some capital by the sale of preferred stock which does not share in voting privileges but which has preferred claims to dividends and assets. Since this method affords a way of securing funds from non-producers without endangering the association's tax exempt status, it is being used more and more frequently by cooperatives.

In contrast with the development in other states, especially Iowa, only three of the creameries surveyed finance their requirements by a "revolving fund" plan. Under this plan capital is obtained by making regular butterfat deductions and crediting these deductions to the account of each patron. When capital has been built up to a satisfactory level, proceeds secured by continuing the deductions are used to retire the oldest revolving fund certificates or shares.

A majority of the creameries have repurchased varying amounts of stock from their members. The extent of this practice is shown by the treasury stock account which averages about \$1,177 per creamery (Table 17). Seventy creameries showed no treasury stock, and 79 had amounts varying from \$1 to \$2,000. One creamery showed repurchases of stock amounting to \$10,000. Some creameries indicated that they were mak-

ing all the repurchases they could in order to reduce the stock outstanding to the lowest possible figure and thereby avoid the six to eight per cent annual dividend payments. This practice is not to be recommended if it results in reducing some patrons to non-member status.

Financial Relationships

A strong financial condition requires that certain standard relationships be maintained between the various balance-sheet items. These relationships are generally expressed as financial ratios, four of which are included in Table 19.

Table 19. Classification of 146 Minnesota Cooperative Creameries According to the Size of Specified Financial Ratios, 1934

Size of ratio	Current assets to current liabilities	Net worth to total liabilities	Net worth to fixed assets	Net worth to capital stock
		Number of creameries		
Less than 1.00	30	13	49	6
1.00-1.99	60	34	81	30
2.00-2.99	15	27	11	29
3.00-3.99	7	17	4	21
4.00-4.99	4	13	0	18
5.00 and over	30	42	1	42
Total	146	146	146	146

The most commonly used of these ratios is that of current assets to current liabilities, which indicates the current solvency of the business. To be solvent from this point of view, a creamery should have current assets at least equal to current liabilities. Since current assets are required for other purposes than the payment of current debt, a current ratio of 2 to 1 is usually recommended. Cooperative creameries may maintain a current ratio varying from 1 to 1 to 2 to 1 with some safety because accounts payable to patrons generally constitute the largest proportion of current liabilities. It will be observed from Table 19 that 30 creameries did not have sufficient liquid assets to meet current creditor claims in full upon demand. In contrast, 30 creameries showed ratios in excess of 5 to 1. The weighted average current ratio of this group of creameries was 1.46 to 1, which indicates a relatively favorable financial condition.

The ratio of net worth to total liabilities indicates to what extent the association is financed by owner capital and to what extent by 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 creameries combined, this ratio showed a 2.78 to 1 relationship indicating that \$2.78 of owner capital was provided to each \$1 of creditor capital. Only 13 creameries showed total liabilities in excess of net worth. Such creameries find it more difficult to secure credit on favorable terms.

A common rule of sound finance for this type of concern is that fixed assets representing buildings and equipment should be financed by owner capital. To ascertain if this desirable relationship is being maintained, the ratio of net worth to fixed assets is used. This ratio should at least be on a 1 to 1 basis. Table 19 reveals that 49 creameries failed to finance all their fixed assets from capital stock and surplus. The net worth of all creameries combined exceeded the amount of fixed assets by a small margin, \$1.16 of net worth to every \$1 of fixed assets.

The fourth ratio in Table 19 shows the relationship between net worth and capital stock. Since net worth includes the par value of stock outstanding and all the surplus and reserves, this ratio indicates the book value of every dollar invested by the members. Indicative of the strong net worth position of these associations is the fact that on the average their book value is equal to \$2.91 for every dollar of stock outstanding. Forty-two creameries showed a ratio in excess of 5 to 1. Of these, 15 had ratios exceeding a 10 to 1 relationship. An unusually large ratio is a violation of cooperative principle and should be avoided. The state cooperative law recommends a relationship of 1.5 to 1 between net worth and capital stock and indicates that the ratio should not be in excess of 2 to 1.⁸

Comparison of the net worth to capital stock ratio of creameries classified according to volume shows that the average ratio of the smaller plants is considerably below that of the larger ones. Creameries producing over 625,000 pounds of butter annually showed an average net worth amounting to 451 per cent of the value of the outstanding stock.

Measuring Financial Management

In order that individual creameries may ascertain their relative success in managing their finances, the averages and desirable standards for the four more important ratios are presented in Table 20.

Table 20. Averages and Desirable Standards for the More Important Financial Ratios, 1934

Ratio	Average for 146 creameries	Desirable standard
Current assets to current liabilities	1.46	1.00 or 2.00
Net worth to total liabilities	2.78	2.00
Net worth to fixed assets	1.16	1.00
Net worth to capital stock	2.91	1.50

A comparison of the ratios of each creamery with the desirable standards in Table 20 indicates that a majority of these creameries are in an excellent financial condition. In 71 creameries all four of the financial

⁸ See Minnesota Department of Agriculture, Dairy and Food bulletin entitled "Laws of Minnesota Relating to Cooperative Associations," 1936, pp. 11 and 17.

ratios described above equaled or surpassed the desirable standards given in Table 20 (see Table 21). Only five creameries were below the desirable standards with all their ratios. These creameries and several of those with only one ratio above standard were facing well-nigh insoluble credit problems which may in time require reorganization or some other drastic action. One of these plants has ceased operations since this survey was made.

Table 21. Classification of 146 Creameries According to Number of Financial Relationships in Which They Excelled, 1934

Number of ratios equaled or exceeded	Number of creameries	Per cent of creameries
None	5	3.4
One	17	11.7
Two	26	17.8
Three	27	18.5
Four	71	48.6
Total	146	100.0

Suggestions for Improvement in Creamery Financing

Although a large proportion of these creameries are in a strong financial position, there is still a need for considerable improvement. The results of this study indicate that Minnesota cooperative creameries should give careful attention to the following points if their financing is to be improved:

1. Accurate and adequate accounts are indispensable to sound financial policy. Most creameries need to adopt improvements in the valuation of balance-sheet accounts. Accounting and financial policy affecting depreciation are in special need of clarification.

2. Since creameries tend to overinvest in physical facilities, especially buildings, those associations contemplating new construction should strive to keep this item in line with their reasonable future needs.

3. Most cooperative creameries have accumulated large surpluses usually by failing to credit patrons with the value of butterfat deductions or net earnings. While it is recognized that surpluses and net worth reserves are necessary to meet inevitable business contingencies, a policy of equitable financing should provide a method whereby surplus accumulations in excess of legal requirements may be definitely credited to patron capital accounts. This result may be effected by issuing capital stock for the excess surplus, or by issuing non-interest-bearing equity reserve certificates, or by a more universal adoption of revolving fund plans in the financing of local creameries. Such a plan would be a factor in placing many associations on a definite tax-exempt basis, which is of increasing importance as the government increases the types and rates of taxes applying to corporations.



PATRONAGE AND BUTTERFAT SUPPLY

The efficiency of a creamery is highly dependent upon its volume of business. It is a well-known principle that as the volume of production is increased to the point of maximum capacity of plant, labor, and management, the per unit costs of operation tend to decline. The available evidence indicates that few, if any, Minnesota cooperative creameries have expanded their volume to the point of maximum capacity. The majority of plants would show important operating gains if the amount of butterfat processed were increased.

Factors Affecting Butterfat Supply

The more significant factors determining the supply of butterfat of a creamery are (1) the amount of butterfat produced in the territory served and (2) the patronage the creamery obtains from butterfat producers in its supply area. The patronage which a given cooperative creamery will enjoy depends on such varied factors as (a) interest of producers in the cooperative creamery; (b) the number of competing butterfat buyers serving the community and the competitive practices which they have adopted; (c) the butterfat assembly services being offered patrons; (d) butterfat buying policies; (e) sideline and other services, and (f) prices being paid for butterfat. Various less tangible considerations, such as (g) the location of the trading center for the area and (h) the ability of the creamery management and producers to work together, affect the amount of patronage.

Patronage Relationships

The usual number of patrons in the 175 creameries studied was between 100 and 200 (Table 22). The smallest creamery of the group had only 40 patrons who delivered a total of 36,000 pounds of butterfat during the year. A volume of business as small as this is clearly inadequate for efficient operation. In such cases, patrons could increase their returns by delivering to neighboring creameries. The creamery with the largest patronage, processing the butterfat of 850 producers, demonstrated the efficiency of its operations by showing the lowest cost per pound of butter manufactured.

Patron records covering a four-year period beginning with 1931 revealed that in a majority of cases the patronage of the larger volume plants was increasing, while that of the smaller volume plants was decreasing. Creameries producing more than 625,000 pounds of butter annually reported a 9.7 per cent increase of patrons in these four years, while the creameries manufacturing less than 125,000 pounds indicated a decrease of 16.4 per cent.

Cooperative Loyalty as a Basis of Obtaining Patronage

A basic portion of the patronage of these creameries is provided by producers who are cooperatively minded and consequently prefer to

process and market their products through cooperative associations rather than private organizations. This group of producers is attracted by the equitable business methods of the cooperative and have faith in its ability to maximize the return on their product. In many instances, the loyalty of this core group of patrons outweighs the price incentives competing butterfat buyers may place before them.

Table 22. Classification of 175 Minnesota Cooperative Creameries According to the Number of Patrons, 1934

Number of patrons	Number of creameries	Per cent of creameries	Average volume of butterfat per creamery
			pounds
Less than 100	26	15.0	128,705
100-149	37	21.4	194,157
150-199	37	21.4	243,678
200-249	29	16.8	318,129
250-299	21	12.1	340,958
300-349	7	4.1	419,647
350-399	3	1.7	569,794
400 and over	13	7.5	741,015
Total	173	100.0	290,244

Competing Butterfat Buyers Limit Creamery Patronage

The patronage and volume of business of all these creameries are limited in varying degrees by the presence of other competing butterfat buyers in their territories. According to Table 23, many of the competitors of these 175 creameries are other cooperatives. Although none of the creameries surveyed was in competition with another cooperative creamery in the same town, this situation does exist in some Minnesota communities. In the case of 55 of the 175 creameries included in this study, one or two other cooperative creameries were operating within a five-mile radius of the plant. When the creamery's supply area is extended to a 10-mile radius, and with modern transportation this is a reasonable supply radius, the presence of as many as five or six other cooperative creameries is frequent. One creamery had 11 cooperative competitors in this limited area.

Competition from other butterfat buyers, such as independent creameries and cream stations, also is keen in many places. Many of these competing organizations are located in the same city or village as the cooperative creamery. Table 23 reveals that all but 95 of the creameries studied compete with local cream stations. Eleven creameries have four or more of these buyers with which to compete locally. Independent creameries were being operated in 13 cooperative creamery towns. Fourteen of the creameries included in the study were located in towns having one or more large milk-bottling plants, ice cream plants, centralizers, or cheese factories.

The last column of Table 23 summarizing the number of competing butterfat buyers of all types located within specified radii of these 175

creameries shows that 81 have no local competition. Within a 10-mile radius it is common for these creameries to have from three to seven competing buyers of all types. One creamery was surrounded by 16 competitors located less than 10 miles away.

Table 23. Classification of 175 Creameries According to the Number of Competing Butterfat Buyers within Specified Distances, 1934

Number of competing buyers and their location	Type of competing buyer						
	Other cooperative creameries	Independent creameries	Cream stations	Centralizers	Ice cream and milk bottling plants	Cheese factories	All types of buyers combined
Number of creameries reporting designated types of competition							
In same town:							
None	175	162	95	171	167	173	81
1	0	10	34	4	5	2	37
2	0	3	22	0	1	0	24
3	0	0	13	0	1	0	18
4 and over	0	0	11	0	1	0	15
Total	175	175	175	175	175	175	175
Within a 5-mile radius:							
None	118	151	78	170	163	170	41
1-2	55	24	64	5	10	4	74
3-4	2	0	25	0	1	1	41
5-6	0	0	8	0	1	0	19
Total	175	175	175	175	175	175	175
Within a 10-mile radius:							
None	24	102	70	165	158	159	2
1-2	54	63	63	10	15	14	22
3-4	52	10	29	0	1	0	48
5-6	36	0	10	0	1	0	46
7-8	8	0	2	0	0	2	35
9-10	0	0	1	0	0	0	8
11-12	1	0	0	0	0	0	7
13 and over	0	0	0	0	0	0	7
Total	175	175	175	175	175	175	175
Within a 15-mile radius:							
None	9	68	68	149	154	154	0
1-2	23	84	62	25	19	18	5
3-4	52	22	30	0	1	1	17
5-6	45	1	12	1	1	0	43
7-8	28	0	2	0	0	0	41
9-10	8	0	1	0	0	2	32
11-12	6	0	0	0	0	0	16
13-14	2	0	0	0	0	0	8
15 and over	2	0	0	0	0	0	13
Total	175	175	175	175	175	175	175

This dense distribution of competing butterfat buyers is largely the result of the limited means of transportation available prior to 1910 when most of these creameries were organized, making it necessary to establish many small plants within easy access of butterfat producers. With

modern methods of manufacture, these duplications prevent many creameries from utilizing their plants and personnel fully and thereby reducing their costs per unit. The result is that of reducing the returns to butterfat producers.

The effect which additional competitors will have on creamery patronage and volume will depend upon the competitive practices employed. Most of these competing units are under pressure to increase volume in order that they may operate more efficiently. A variety of service and price inducements are consequently made in order to attract the needed patronage. Among these inducements extended to producers are butterfat assembly services which often have been paid for in whole or in part by the creamery, special financial services to patrons such as cash payment for butterfat or liberal cash advances, cow-testing aid, receipt of cream on Wednesday and Saturday evenings, free buttermilk, sideline services oftentimes offered on a liberal credit basis, and, most important of all, the payment of attractive prices for butterfat.

Butterfat Assembly Methods

Transportation developments, such as improved roads and the truck, are changing butterfat assembly methods and intensifying the competition for butterfat. Table 24 shows that although the largest proportion of the butterfat of these creameries is delivered by individual patrons or by groups of patrons organized into cooperative routes, a considerable proportion of the butterfat of 117 out of 175 creameries is being assembled by trucks. The increase in the truck assembly of butterfat has been most rapid in recent years. Prior to 1920 only 28 of the creameries surveyed had regular truck routes. Eight creameries established truck routes from 1920 to 1923, 13 from 1924 to 1927, 24 from 1928 to 1931, and 44 from 1932 to 1935.

Table 24. Classification of 175 Minnesota Cooperative Creameries According to the Per Cent of Butterfat Assembled by Various Methods, 1934

Per cent of butterfat assembled	Individual patrons	Cooperative routes	Trucks
		Number of creameries	
None	6	33	58
1- 24	56	73	56
25- 49	45	29	31
50- 74	34	22	18
75-100	34	18	12
Total	175	175	175

Of the 117 creameries using trucks, 40 had only one route. The remainder had two or more, with some making collections on as many as 26 routes. The length of these routes varied considerably, but the most frequent length was from 20 to 30 miles. Indicative of the territory which is covered by creameries having trucks is the total length of all

their routes. In 11 creameries total route mileage was under 25 miles, in 37 it totalled 25 to 74 miles, in 28 it was 75 to 124 miles, in 8 it was 125 to 174, in 14 it was 175 to 274 miles, and 9 had routes covering over 275 miles.

Table 25. Classification of 109 Creameries According to Rates Paid Butterfat Haulers, 1934

Rate	Number of creameries
cents	
1.00 per pound butterfat	12
1.50 per pound butterfat	33
1.75 per pound butterfat	5
2.00 per pound butterfat	38
2.25 per pound butterfat	1
2.50 per pound butterfat	9
3.00 per pound butterfat	2
35.00 per cwt. cream	3
40.00 per cwt. cream	4
50.00 per cwt. cream	2
60.00 per cwt. cream	1
Flat salary	6
Miscellaneous methods	5
Total	121*

* Total exceeds 109 because some creameries pay haulers according to two or more rates.

Rates paid for truck assembly of butterfat.—In 109 of the 117 creameries assembling butterfat with trucks, the truck was owned and operated by hired haulers. Only eight of the creameries owned and operated their own trucks.

As shown in Table 25, the rates paid hired butterfat haulers ranged from one to three cents per pound for butterfat, the usual rate being two cents. Twelve associations with concentrated supply areas paid as little as one cent a pound for these services.

Table 26. Classification of 40 Creameries According to Method of Sharing Hauling Charges between Patrons and the Creamery, 1934

Method		Number of creameries using method
Patron's share	Creamery's share	
cents per lb.		
0.50	1.50	2
0.75	1.00	2
1.00	0.50	8
1.00	0.75	1
1.00	1.00	9
1.50	1.00	3
1.50	0.50	6
1.75	0.25	2
2.00	0.50	4
30-40 per cwt.	10 per cwt.	3
Total		40

In 59 creameries the patrons paid all hauling charges. In 18 cases the creamery absorbed all of these charges, while in 40 associations they were shared on a proportionate basis by the patron and the creamery. Table 26 shows the various ways in which patrons and creameries shared these costs. The practice of having the creamery absorb part or all of the costs of hauling has been very effective in obtaining patronage, especially from longer distances. However, since all costs absorbed by the creamery must ultimately be borne by all the butterfat handled, this practice has often favored distant patrons at the expense of those patrons near the creamery who deliver their own product.⁹

Effects of truck assembly of butterfat.—The use of trucks in the assembly of butterfat has been a very important factor in maintaining or increasing the volume of these creameries. As shown in Table 27, the average volume of the creameries which assemble over 50 per cent of their butterfat by truck was 317,860 pounds as compared with 252,631 pounds in the associations in which no trucks were used and 304,542 pounds where trucks were used only to a limited extent. This table reveals, however, that three of the creameries without trucks were able to obtain a volume of over 600,000 pounds of butterfat. These facts indicate that some of the associations relying solely on patron delivery were able to attract a large volume of business on the basis of other inducements such as favorable prices or other attractive services.

Table 27. Relationship between Volume of Butterfat Received and Method of Assembly in 173 Creameries, 1934

Butterfat received pounds	Number of creameries using specified method of butterfat assembly		
	Patron delivery only	50 per cent or less by truck	More than 50 per cent by truck
Less than 100,000	3	2	3
100,000-199,999	23	28	5
200,000-299,999	16	24	8
300,000-399,999	9	14	9
400,000-499,999	5	9	3
500,000-599,999	0	2	0
600,000 and over	3	7	2
Total	59	86	30
Average volume per creamery	252,631	304,542	317,860

Many creameries adopt trucks with the expectation that increased volume will reduce unit plant costs sufficiently to offset added assembly costs. While this may be true in plants with considerable unused capacity, it must be realized that as volume increases, unit costs tend to fall

⁹ Chapter 420, Session Laws of 1937, restricts this competitive practice by requiring butterfat buyers to deduct the full cost of transportation up to two cents from the purchase price paid the producer.

less and less rapidly. Consequently the offsetting plant advantage may be smaller than anticipated. Then too, as trucking operations are expanded into areas more and more remote or into areas in which available patrons are widely scattered, assembly costs become increasingly larger.

While the use of trucks has enabled some creameries to increase their volume, it has also brought much additional competition. Table 28 shows that all but 82 of these creameries have one or more competing cooperative creameries operating trucks in their supply area. The last column of this table shows that all but 39 creameries have some type of competing buyer operating trucks within 10 miles of their plants. Three creameries reported as many as seven competing buyers, some with several truck routes, assembling butterfat in this limited area.

Table 28. Classification of 175 Creameries According to the Number of Competing Butterfat Buyers Operating Trucks in a Ten-Mile Radius, 1934

Number of competing buyers	Type of competing buyer				All types combined
	Cooperative creameries	Independent creameries	Centralizers	Others	
	Number of creameries reporting designated types of competition				
0	82	97	163	156	39
1	37	47	9	12	34
2	28	24	3	3	43
3	21	6	0	3	31
4	5	1	0	1	18
5	0	0	0	0	3
6	2	0	0	0	4
7	0	0	0	0	3
Total	175	175	175	175	175

Table 29 shows how deeply the routes of competing butterfat buyers penetrate the supply areas of 136 creameries reporting truck competition. The truck routes of competing cooperative creameries enter the territories of these 136 creameries with more routes than do the independent creameries, but the routes of the latter come closer in more cases. Nineteen independent creamery truck routes pass within less than a mile of these creameries. Thirty-two other independent companies come within one or two miles. It is such a use of the truck method of assembly which has led to retaliation and bitter competition in many creamery areas of the state. The result has been that the butterfat producer has been burdened with the unnecessary cost of frequently duplicated assembly services.

Creamery operators expressed a considerable difference of opinion as to the effect of trucking on the quality of cream received. The beneficial effect of truck assembly on quality was indicated especially in the western section of the state where butterfat production per farm is relatively small. In the older dairy areas in the southeastern part of the state, many operators indicated that cream collected by trucks was often of poorer quality because of deterioration in the extra hours it was on the road.

Table 29. Proximity of the Truck Routes of Competing Butterfat Buyers to 136 Creameries Which Reported Truck Competition, 1934

Closest competing truck route	Type of buyer operating competing route			
	Cooperative creameries	Independent creameries	Centralizers	Others
Miles		Number of routes		
Less than 1	3	19	1	4
1 or 2	33	32	3	7
3 or 4	51	30	1	6
5 or 6	46	16	0	6
7 or 8	23	9	2	3
9 or 10	17	9	3	0

A disadvantage often associated with truck assembly is the loss of personal contact between the creamery operators and patrons and members. This contact is often important in quality improvement work and in the development of cooperative attitudes among patrons.

Butterfat Buying Policies

One hundred twelve of the 175 creameries visited employed a pooling basis of settlement exclusively. Only 13 creameries bought all butterfat on a cash basis. Fifty creameries used both methods of settlement to some extent.

In the 162 creameries which pooled all or part of their business, 39 used a two-week pool while 123 pooled returns for a period of a month.

In using the pooling basis of settlement, creameries encounter several difficult problems in distributing the receipts less the cost of services equitably among the patrons. One of the more difficult problems is that of compensating patrons in an equitable manner for differences in the quality of product delivered, because most creameries do not maintain separate pools based on quality. In lieu of quality pools, all but 53 of these creameries were grading their cream and setting arbitrary price differentials for the various grades of butterfat received (Table 30). The usual premium paid for the better grade of cream was two cents.

Table 30. Classification of 175 Creameries According to Price Differentials between Grades of Butterfat, 1934

Price differential	Number of creameries	Per cent of creameries
cents		
No differential	53	30.3
0.50	2	1.1
0.75	1	0.6
1.00	13	7.4
1.50	1	0.6
2.00	61	34.9
2.50	6	3.4
3.00	35	20.0
5.00	3	1.7
Total	175	100.0

Another problem encountered in pooling is that of distributing equitably the cost of operations to the product handled in the pool period. The allocation of certain costs such as taxes, insurance, management, and depreciation makes this problem even more difficult. The creameries included in this study have adopted various methods in charging expenses against the pool. Twenty-one creameries followed the crude practice of charging the pool with the cash outlays for the period, regardless of when the goods and services purchased were used (Table 31). Since the cash outlays of a period are no measure of actual expenses, the inequities arising under this method are significant.

Table 31. Classification of 175 Creameries According to Method Used in Determining Pool Butterfat Prices, 1934

Method of pool price determination	Number of creameries	Per cent of creameries
Receipts minus cash outlays	21	12.0
Receipts minus 2.00¢ per lb. butter	7	4.0
Receipts minus 2.25¢ per lb. butter	1	0.6
Receipts minus 2.33¢ per lb. butter	1	0.6
Receipts minus 2.40¢ per lb. butter	2	1.1
Receipts minus 2.50¢ per lb. butter	14	8.0
Receipts minus 2.75¢ per lb. butter	7	4.0
Receipts minus 3.00¢ per lb. butter	29	16.6
Receipts minus 3.25¢ per lb. butter	1	0.6
Receipts minus 3.50¢ per lb. butter	9	5.1
Receipts minus 4.00¢ per lb. butter	5	2.9
Receipts minus expenses estimated each period	55	31.4
Cost accounting basis	10	5.7
No pool	13	7.4
Total	175	100.0

Most frequently creameries charge a uniform rate of expense per pound of butter manufactured against the pool. This rate is high enough to enable the association to cover all its operating expenses during the year. According to Table 31, the rate varied from two to four cents a pound in the 76 creameries using this method. The usual rate was three cents per pound.

Fifty-five associations estimated the approximate per pound expense for each pool period instead of attempting to charge a uniform rate over an entire year. A variety of methods were used in making these estimates, some being mere guesses while others considered the proper allocation of expense in great detail. In most cases, the problem of overhead cost allocation was solved by making a uniform "sinking fund" charge.

Only 10 of the creameries allocated expenses to the pool on a careful cost-accounting basis. This method involves the preparation of detailed monthly operating statements in which inventory changes of products and supplies are ascertained, and in which careful allocations for depreciation, taxes, insurance, labor, and other expenses have been made.

More creameries are adopting this method as creamery accounting practices are being improved.

In paying cash for butterfat, these creameries have the problem of establishing a price which will allow an adequate margin for manufacturing and marketing expense and probable losses due to price changes and yet will be high enough to attract local butterfat producers. In setting the cash price, the usual procedure is to relate it to the New York Extra quotation on the day of purchase. Table 32 shows that in the largest number of cases the price is based on the New York Extra quotation without making premium or discount provisions. In six cases, creameries take into consideration overrun, operating cost, and average freight expense with the Extra quotation in setting the price for the day. Seventeen creameries set their cash prices from one to five cents under the New York Extra quotation. Table 32 reveals that many creameries adjusted their cash prices to the prices set by competing butterfat buyers in the community.

Table 32. Classification of 175 Creameries According to the Method of Determining the Cash Price Paid for Butterfat, 1934

Method	Number of creameries	Per cent of creameries
New York Extras	18	10.3
New York Extras plus premium	5	2.9
New York Extras adjusted for cost, freight, and overrun.....	6	3.4
New York Extras with 1¢ discount	9	5.1
New York Extras with 2¢ discount	4	2.3
New York Extras with 3¢ discount	1	0.6
New York Extras with 4¢ discount	1	0.6
New York Extras with 5¢ discount	2	1.1
Local competitive price	17	9.7
No cash prices	112	64.0
Total	175	100.0

Financial stringency among farmers and the activity of competitors who pay cash have led 150 of the 162 creameries using the pooling plan to make cash advances to patrons requesting them. Table 33 shows the wide variations in the limitations placed on these advances. Where competing butterfat buyers were using cash payments or making liberal cash advances, the advances policy of the cooperative creamery also tended to be very lenient. In 66 creameries patrons could obtain 100 per cent of the current market value of the butterfat which they had delivered. There were 12 creameries which made no advances.

Generally, creamery managers were opposed to the policy of cash payments and cash advances because of the extra clerical cost involved, the greater risks of market fluctuations which the association had to assume, and the necessity of having a larger amount of operating capital. Many managers were of the opinion that the emphasis on cash prices was leading to a very unstable patronage situation, because patrons tend

to look at the momentary price advantage rather than the longer run benefits to be derived from their cooperative.

Table 33. Classification of 175 Creameries According to Limitations Placed on Cash Advances to Patrons, 1934

Limitations	Number of creameries	Per cent of creameries
50% of market value	4	2.3
60% of market value	1	0.6
70% of market value	4	2.3
75% of market value	20	11.4
80% of market value	13	7.4
90% of market value	4	2.3
100% of market value	66	37.7
\$25-\$30 maximum	2	1.1
Limitation discretionary with a designated creamery official	36	20.6
No cash advances	12	6.9
All payments on cash basis	13	7.4
Total	175	100.0

Other Service Inducements To Producers

In order to attract butterfat producers to their plants, some creameries have in recent years added extensive sideline services. These services were often added in order to meet the service competition of cream stations and produce houses. Inland or small village creameries have often adopted sidelines in order to stop the shift of patrons to the creameries located in the larger trading centers. The nature of these sideline services is considered in detail in a later section of this study.

Price as a Basis of Attracting Patronage

The price paid for butterfat is in the final analysis the principal factor affecting the patronage of these creameries. It is a legitimate practice for a cooperative creamery to increase its volume of business by the payment of attractive prices for butterfat, if it is able to do so because it has lower operating costs, or receives higher net prices for its butter, or both. The cooperative creamery deserves the support of producers on the basis of its relative economic efficiency and its ability to increase their net returns.

Quite frequently prices paid by the efficient creamery are in some manner or other equaled by less efficient competitors, thus eliminating price advantage as a basis for attracting patronage. In such cases, some cooperatives have found it advantageous to pay for butterfat at a lower current rate and then distribute a patronage dividend at the end of the year. In 1934, 23 of these associations were paying patronage dividends as an extra price inducement to producers.

Because of the emphasis which producers place on prices in choosing an outlet for their butterfat, some creameries resort to unfair, unethical, or illegal methods in order to pay the highest possible prices. In some

cases, competitors overpay or pay as high prices as the efficient cooperative creamery merely because their accounting records are so inadequate that important expenses such as depreciation are neglected. There are other cases in which the capital of the organization is knowingly dissipated in maintaining prices at a higher level than the available receipts warrant.

Lack of uniformity in the method of quoting butterfat prices handicaps producers in selecting butterfat outlets. Some buyers quote gross prices in the hope of attracting the less critical producers. In case gross prices are reported, various deductions may be made from the patron's check for special plant expenses, hauling charges, or other services.

In an effort to pay higher prices for butterfat, some butterfat buyers may manipulate weights, test, and overrun. Other buyers violate the state grading law in order to give certain patrons higher prices than the quality of their product deserves. Prosecutions by the state indicate that such practices exist.

Suggestions for Improvement of Competitive Conditions

The best interest of the producer calls for such an organization of dairy plants and truck routes that the combined costs of butterfat assembly, manufacture, and marketing may be reduced to a minimum.

1. A more efficient distribution of plants can be secured by the elimination of some units by competitive processes or by the planned consolidation of small plants into larger ones. The former course is slow, will involve many losses, and will provide no assurance that those creameries will be continued whose survival is justified. Consolidation effected by the coordinated action of groups of creameries united in the desire to eliminate unnecessary costs is the most desirable solution of the problem.

2. There is a great need for a more economical arrangement of truck routes. This will also involve planning and greater control of trucking operations by the creameries in order to reduce the cost of butterfat assembly.

3. Greater uniformity in the method of quoting butterfat prices and accounting for pool benefits would be helpful to producers seeking the best outlets for their products.

MEASURES OF CREAMERY EFFICIENCY

The most satisfactory measure of creamery *manufacturing efficiency* considered from the economic viewpoint is the cost of manufacture per unit of product. These costs and the factors responsible for their variation will be examined in this section. The best measure of creamery *marketing efficiency* is the net price received per pound of butter sold.

Patrons of cooperative creameries usually measure the *general economic efficiency* of their creamery by the price which it pays for butterfat. However, these payments are not always a reliable basis for comparing the efficiency of creameries because some creameries pay their patrons

more than is warranted by their annual receipts while others retain considerable amounts for capital expansion. In view of these and other variations in the butterfat payment practices of creameries, the measure selected to ascertain their *general economic efficiency* was the net return available for each pound of butterfat handled. This figure, or index of general efficiency, was arrived at by taking the actual payments made to farmers for butterfat, adding to these payments any cream hauling charges absorbed by the creamery,¹⁰ and then adding the net gain (or subtracting the net loss) per unit reported for the year in the adjusted operating statement.

MANUFACTURING OPERATIONS

Labor and Management

Differences in the manufacturing efficiency of creamery plants depend to a large extent upon variations in the administration of labor and management. The importance of successful labor adjustments in creamery manufacturing operations is shown by an analysis of the 1934 operating statements of 173 of the 175 cooperative creameries included in this study which revealed that, on the average, labor costs represented 31 per cent of all operating costs. In terms of per unit costs the average labor cost of these creameries was 0.831 cent per pound of butter made in a total operating cost of 2.651 cents. The labor costs included in these calculations are all wages and salaries paid to managers, operators, churnmen, helpers, and others directly employed in the processing operations. Salaries and fees paid directors, officers, and bookkeepers are included under general and administrative expense. Payments for special labor such as draying, repairing, cream hauling, and sideline operation are included in other appropriate sections of the operating statement.

Because of the widely varying conditions under which these creameries operate, there is a considerable variation in the labor costs of individual creameries around the average per unit labor cost. In one plant these costs were as low as 0.376 cent a pound. In another plant labor costs reached an upper limit of 1.787 cents a pound. Approximately three-fourths of the creameries had labor costs ranging from 0.6 to 1.1 cents a pound.

Some of the more important factors responsible for these labor cost variations between creamery plants are listed and discussed below. They are: (1) Differences in the volume of output, (2) differences in the amount of labor employed and its utilization, and (3) differences in the rates of wages paid to employees. In some respects these factors are interrelated and mutually condition each other.

Effect of volume of output on labor cost.—The relationship between the volume of output of these creameries and labor costs per unit

¹⁰ This adjustment improves the comparison between creameries. In this way the average return of each creamery is the return before any deductions have been made for cream hauling.



of product is indicated in Table 34. This table shows that average labor costs declined from 1.181 cents a pound in plants producing less than 125,000 pounds annually to 0.709 cent in plants producing more than 625,000 pounds.

Table 34. Relationship between Labor Cost and Volume in 173 Creameries, 1934

Volume	Number of creameries	Labor cost per pound
pounds		cents
Less than 125,000	9	1.181
125,000-249,999	53	1.030
250,000-374,999	50	0.877
375,000-499,999	32	0.779
500,000-624,999	15	0.762
625,000 and over	14	0.709
Total	173	0.831

Figure 5 illustrates the relationship between volume and labor cost in greater detail. In this figure each creamery is plotted according to its volume and per unit labor cost and a line of average relationship is fitted to the resulting points. This curve shows that per unit labor costs declined most rapidly as volume was increased to 350,000 pounds annually. Beyond this point variation in the size of business, although significant, apparently had less influence on costs than did other factors.

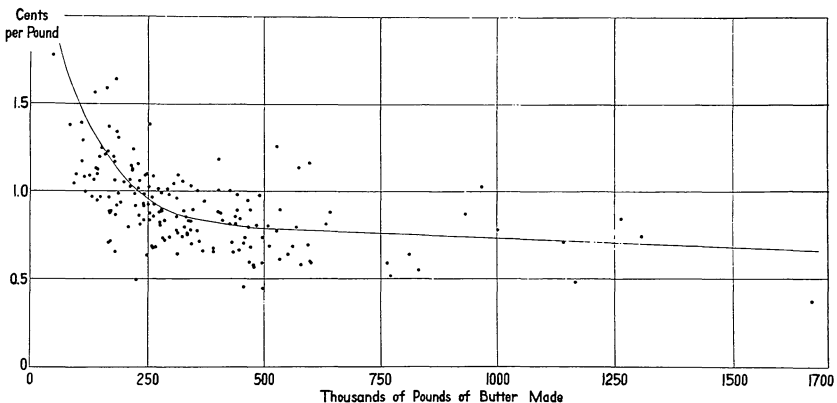


FIG. 5. RELATIONSHIP BETWEEN LABOR COST PER POUND OF BUTTER MADE AND VOLUME OF OUTPUT IN 173 CREAMERIES, 1934

Per unit labor costs declined most rapidly as volume was increased to 350,000 pounds annually. Beyond this point variation in the volume of output had less influence on costs than did other factors.

Effect of the amount of labor and its utilization.—In the first column of Table 35 these creameries are classified according to the amount of labor they employ and according to the combination of helpers with the operator or head buttermaker. Eleven creameries employed only

an operator with no helpers. The most common combination of employees is that of an operator and one full-time helper. In eight of the plants a manager was employed who assumed the managerial duties generally performed by the operator and who also assisted in the plant operations. Part-time helpers were generally hired for a period of one to four months to assist in plant operations in the season of heaviest butterfat receipts.

Although the amount of labor employed by these creameries is an important factor affecting per unit labor costs, the utilization of this labor is even more important. Whether or not a creamery will secure a relatively efficient utilization of its personnel depends, among other things, upon the manager's ability in employing the proper amount of labor relative to the volume of business, the skill and willingness of the workers, and the convenience of plant arrangements. The adjustment of the proper amount of labor to the volume of business is one of the most difficult of these problems of management because labor can not as a general rule be added or subtracted as readily as changes occur in the volume of business.

Wide variations in the utilization of labor are revealed by an examination of the third column of Table 35 which shows the ranges in pounds of butter made with various combinations of personnel. For instance, in one of the creameries employing only an operator, one man made as little as 45,000 pounds of butter in a year, while at the other extreme one man was processing as much as 240,000 pounds without the assistance of a helper. In the group of 55 creameries employing an operator and one full-time helper there is one plant in which two men made only 108,000 pounds of butter in the course of the year, while in another plant the same number of men manufactured 476,000 pounds annually.

Incomplete utilization of available labor in the buttermaking department may be compensated by its utilization in conducting a sideline business, in handling milk and cream for local consumption, in buttermilk drying operations, and in performing services beyond the minimum manufacturing requirements, such as printing a large proportion or all the butter output. The extent to which labor utilization is improved by these factors can be roughly ascertained by an examination of the columns in Table 35, entitled "Sideline business," "Market milk sales," "Dry buttermilk sales," and "Butter printed."

In some instances the utilization of creamery personnel is improved by undertaking the type of sideline operations in which the demand for labor does not seriously conflict with the peak demand for labor in the butter department. By allocating the cost of this labor to the sideline business on the basis of the time spent, the labor costs may be reduced. The average of sideline sales shown in dollars in Table 35 reveals that this business is generally of minor consequence in plants employing less than two full-time men, hence is not a material factor in improving labor utilization in the smaller plants. In some plants the sideline business is

Table 35. Amount of Labor Employed and Factors Affecting Labor Utilization in 173 Creameries, 1934

Amount of labor employed	Factors affecting labor utilization														
	Butter made			Sideline business		Market milk sales		Dry buttermilk		Butter printed		Total sales			
	No. of creameries	Av. amt., 1,000 lbs.	Range, high and low, 1,000 lbs.	No. of creameries	Average amount	No. of creameries	Average amount	No. of creameries	Average amount	No. of creameries	Av. amt., 1,000 lbs.	No. of creameries	Average amount	Range, high and low,	
Operator only	11	134	45-240	7	\$ 509	6	\$ 134	.....	.....	10	13	11	\$ 33,029	\$ 11,027-\$ 60,371
Operator and 1 P.T.H.*	15	199	117-286	11	789	9	161	.....	.....	14	31	15	48,815	29,187- 69,451
Operator and 2 P.T.H.	2	220	165-275	1	9,892	2	523	.....	.....	2	38	2	58,017	48,518- 67,515
Operator and 1 F.T.H.†	55	251	108-476	50	2,700	41	336	1	\$ 2,601	54	30	55	63,520	30,864- 131,740	
Operator and 1 F.T.H. and 1 P.T.H.	20	317	158-503	17	7,021	14	458	1	1,083	20	52	20	84,435	56,250- 124,033	
Operator and 1 F.T.H. and M.‡	4	341	229-599	3	20,856	2	313	.....	.....	4	43	4	97,440	55,503- 146,890
Operator and 2 F.T.H.	30	403	183-640	25	10,163	22	3,378	1	2,490	30	90	30	109,818	45,684- 162,734	
Operator and 2 F.T.H. and 1 P.T.H.	12	465	254-811	7	8,925	9	2,387	2	1,980	12	139	12	123,723	68,723- 196,609	
Operator and 2 F.T.H. and M.	3	508	402-592	2	2,207	3	7,246	1	2,887	3	103	3	133,184	104,429- 151,828	
Operator and 3 F.T.H.	7	609	380-1,165	7	9,029	6	2,641	2	2,794	7	84	7	161,246	107,036- 287,335	
Operator and 3 F.T.H. and 1 P.T.H.	4	555	380-824	4	14,248	3	5,710	1	3,774	4	186	4	156,648	110,783- 205,523	
Operator and 4 F.T.H. and P.T.H.'s ...	3	825	368-1,668	3	44,585	3	1,545	.....	.....	3	100	3	248,526	130,187- 476,411
Operator and 5 F.T.H.	3	997	922-1,141	3	2,369	3	23,008	3	10,344	3	229	3	260,023	238,240- 289,147	
Operator and 6 F.T.H. and P.T.H.'s ...	3	846	767-933	2	30,088	3	43,469	3	3,308	3	364	3	270,417	233,563- 335,066	
Operator and 7 F.T.H. and M.	1	1,000		1	75,000	1	307	1	5,340	1	1,000	1	330,983		
Total	173			143		127		16		170		173			

* P.T.H. = Part-time helper.

† F.T.H. = Full-time helper.

‡ M. = Manager.

so large that part of the personnel devotes full time to it, in which event there is no material improvement in the utilization of labor in the butter department except insofar as part of the management cost can be allocated to sidelines.

Market milk and buttermilk drying operations are relatively unimportant in the majority of creameries, but where they are important and are properly correlated with the butter department they offer some opportunity to improve the utilization of labor.

In many plants the printing of butter is a significant factor in improving the use of labor because the work which is involved is generally fitted into the daily schedule when labor is not needed for other purposes. Although the printing of large amounts of butter makes possible a more efficient utilization of personnel, it does not reduce per unit labor costs but is a factor in increasing the receipts from butter sold.

A complete comparison of the relative efficiency of creameries in the use of labor is difficult because the labor output has not been described in common units. While the measurement of the total labor output of these creameries in terms of the total of all sales in dollars does not recognize all the factors involved, it is the best available index of labor utilization in these plants. Significant differences in the use of labor by creameries having the same personnel combinations are revealed by a comparison of the lowest and highest total sales in each case.

To compare the efficiency of creameries in the utilization of each employee, the average sales per employee were calculated.¹¹ Table 36 shows that as sales per employee increase, unit labor costs decrease. The 12 creameries least efficient in the use of labor had labor costs of 4.71 cents for each dollar of net sales, while the 18 creameries most efficient in the use of labor had labor costs of 2.43 cents for each dollar of sales.

Table 36. Relation between Total Sales per Employee and Unit Labor Costs in 173 Creameries, 1934

Sales per employee	Number of creameries	Average sales per employee	Labor cost per pound of butter made	Labor cost per dollar of sales
			cents	cents
Less than \$20,000	12	\$17,904	1.200	4.71
\$20,000-\$29,999	47	25,373	0.954	3.48
30,000- 39,999	67	35,356	0.898	3.45
40,000- 49,999	29	45,461	0.739	2.84
50,000 or more	18	59,515	0.624	2.43
Average		\$35,585	0.831	3.07

A variety of other factors even less subject to measurement than those just considered affect the utilization of labor and explain some portion of the variation in per unit labor cost found in Figure 5. Some

¹¹ The total annual sales of each creamery were divided by the average number of persons employed during the year. An employee working for three months was included as one-fourth of a person, one working for four months as one-third, etc.

of these factors are differences in the amount and capacity of equipment, differences in the adoption of labor-saving devices such as artificial refrigeration, differences in the convenience of plant arrangement, differences in the hours in which patrons may make cream deliveries, differences in the number and size of patron cream deliveries, differences in the quality of milk and cream received, differences in the quality of the finished product, and differences in the volume of output in various seasons of the year.

Effect of wage rates on labor costs.—Part of the variation in labor costs between creameries may be attributed to differences in the scale of wages paid employees. Table 37 shows the distribution of creameries according to amounts paid their operators. Most frequently the operator is paid from \$1,800 to \$2,200. One operator received as little as \$802 annually, while at the other end of the scale one received as much as \$3,120. Some of the factors which give rise to these differences in wage rates established by creameries are: The number of men employed and in what combinations these men are employed; the volume of business handled; the method of payment used; the training and experience of the men employed; length of service of men employed, and other less measurable factors.

Table 37. Classification of 173 Creameries According to the Total Net Salary and Commissions paid to Operators in 1934

Total net salary and commissions paid	Number of creameries	Per cent of creameries
Less than \$1,000	4	2.3
\$1,000-\$1,399	25	14.5
1,400- 1,799	53	30.6
1,800- 2,199	58	33.5
2,200- 2,599	20	11.6
2,600- 2,999	10	5.8
3,000 and over	3	1.7
Total	173	100.0

Table 38 shows the average annual wages of the various types of creamery employees according to 15 different combinations of personnel. The second column of this table reveals a tendency of the average annual salary of the operator to increase as the size of the labor force and the volume of business of the creamery are expanded. In 11 creameries employing no helpers, the operator's average annual salary was \$1,286. When the operator supervises the work of five full-time helpers producing an average of 997,468 pounds of butter annually or nearly \$260,000 of sales, his salary was increased correspondingly to \$2,681 annually. Salaries paid first helpers increased from \$612 annually in creameries with only one such helper to \$1,420 annually in creameries employing four helpers. Second and additional helpers received less on the average than first helper in each combination. The wages of managers were relatively low in most instances because they did not devote their full

Table 38. Combinations of Personnel and Average Annual Wages Paid Each Class of Employee in 173 Creameries, 1934

Amount of labor employed	Average annual wages and commissions paid employees							
	No. of creameries	Operator	First full-time helper	Second full-time helper	Third full-time helper	Fourth and other full-time helpers	Part-time helpers	Manager
Operator only	11	\$1,286	.....	.....	.....	.....	.....	.....
Operator and 1 P.T.H.*	15	1,657	.....	.....	.....	.....	\$163	.....
Operator and 2 P.T.H.	2	1,680	.....	.....	.....	.....	417	.....
Operator and 1 F.T.H.†	55	1,686	\$ 612	.....	.....	.....	.....	.....
Operator and 1 F.T.H. and 1 P.T.H.	20	1,872	872	.....	.....	.....	170	.....
Operator and 1 F.T.H. and M.‡	4	1,878	870	.....	.....	.....	.....	\$ 710
Operator and 2 F.T.H.	30	1,893	934	\$ 610	.....	.....	.....	.....
Operator and 2 F.T.H. and 1 P.T.H.	12	2,256	929	774	.....	.....	206	.....
Operator and 2 F.T.H. and M.	3	2,565	1,067	720	.....	.....	.....	1,793
Operator and 3 F.T.H.	7	1,907	1,058	924	\$ 562	.....	.....	.....
Operator and 3 F.T.H. and 1 P.T.H.	4	2,102	959	765	640	.....	489	.....
Operator and 4 F.T.H. and P.T.H.'s	3	2,276	1,420	788	868	\$720	150	.....
Operator and 5 F.T.H.	3	2,681	1,192	1,060	1,000	850	.....	.....
Operator and 6 F.T.H. and P.T.H.'s	3	1,900	1,080	980	880	693	90	.....
Operator and 7 F.T.H. and M.	1	2,400	660	660	660	660	.....	1,200

* P.T.H. = Part-time helper.

† F.T.H. = Full-time helper.

‡ M. = Manager.

time to creamery duties or because their duties were largely of a secretarial nature.

There is a great deal of difference between creameries in the methods used in paying employees and especially the operator. Three of the principal methods of payment are the straight salary, a salary with a commission based on output, and the commission alone. In 1934, the operators or head buttermakers of 58 of these creameries were paid on the straight salary basis, 95 were paid a combination of salary and commission, and 22 were paid commissions only. Variations of rates under each method are too numerous to describe in detail, there being as many as 45 different variations of the salary-commission method alone. The most frequently used plan, employed by 21 creameries, was the \$1,200 salary with a one per cent commission on dairy product sales. The next most popular salary-commission plan was the \$1,200 salary with a half cent commission on each pound of butter made. Thirteen creameries paid their operators a straight \$1,800 salary without commissions. Several creameries based commissions on the quality of butter produced. One creamery, for instance, paid a salary of \$720 plus a half cent per pound on 93 score butter plus one quarter cent per pound on 92 score butter. Other creameries allowed the operator a certain amount of commission on sideline sales in addition to the commission on butter output. Average compensation was largest for operators employed under the salary-commission method, being \$1,863 against \$1,849 under the straight commission method and \$1,738 under the straight salary plan.

Additional variations in operator compensation occurred because about one-half the creameries provided their operators with various perquisites such as butter, cream, milk, or free house rent in addition to the regular salary and commission. These perquisites were commonly valued at \$50 to \$100 by the operator, and in 10 cases amounted to more than \$300 a year.

Concerning the training of the operators of the 175 creameries studied, the records reveal that 55 had gone to school beyond the eighth grade. Of these, 30 had completed high school and two had completed a college course. One hundred twenty-six operators had taken either a dairy short course or other dairy training. Although somewhat lacking in formal education, most operators have had many years of experience in the creamery business. Only seven had less than five years of experience. Approximately 50 per cent of the operators reported from 10 to 20 years of experience. That training and experience affect wages paid to operators is no doubt true, but the relationship would be difficult to ascertain with any exactness.

The location of a creamery appears to be another factor affecting wage rates. The average compensation of operators in inland or small village creameries was \$1,483 as against \$1,882 for operators in the larger centers. Operator wage scales also varied because of such considerations as the quality of the operator's services in the plant, his

work among patrons, and his ability to organize in an effective way all the functions of the creamery association. The effect of such factors could not be measured.

The wages paid by these creameries were reduced considerably between 1929 and 1935. In a majority of creameries wages were reduced from 15 to 35 per cent in this five-year period. Four creameries reported reductions as large as 60 per cent. The average payments to operators, including salaries, commissions, and perquisites, were \$2,543 in 1929 and had declined to \$1,864 in 1934.

During 1935 and 1936 there has been a steady increase in the wages paid creamery employees which is reflected in rising per unit labor costs.

Creamery Manufacturing Expense

Variations in manufacturing expenses, other than labor, account for a large proportion of the variation in the total per unit operating costs of the creameries included in this study. The average of these expenses is 1.537 cents per pound of butter made, or 58 per cent of total operating costs. Manufacturing expenses of individual creameries varied from 0.668 cent per pound to 3.303 cents, a spread of approximately 2.63 cents. One hundred twelve creameries, about two-thirds, had manufacturing expenses ranging from one to two cents.

To account for these significant variations in total manufacturing expense, it is necessary to analyze the differences in the component elements of this expense and determine the influence of the factors which give rise to these differences. The more important of these factors are the volume of output, the amount and utilization of the cost elements, and the price paid for each of the cost elements used in plant operations.

The relative importance of the components of manufacturing expense is shown in Table 39. The largest component of manufacturing expense was packing supplies, which was 18.2 per cent of all operating

Table 39. Manufacturing Expense of 173 Creameries, 1934

Manufacturing expense items	Average	Per cent of total operating cost	Cents per pound of butter made
Packing supplies	\$1,738	18.2	0.482
General supplies	632	6.6	.175
Salt	143	1.5	.040
Fuel	677	7.1	.188
Power, light, water, and refrigeration	549	5.7	.152
Taxes	310	3.3	.086
Insurance	168	1.8	.046
Repairs	259	2.7	.072
Depreciation buildings	339	3.5	.094
Depreciation equipment	606	6.3	.168
Miscellaneous	123	1.3	.034
Total manufacturing expense	\$5,544	58.0	1,537

costs. Fuel and general supplies constituting 7.1 and 6.6 per cent, respectively, of all costs were other important manufacturing expenses.

Among the factors giving rise to variations in the component manufacturing expenses is the volume of output as shown in Table 40. This table shows that both component and total manufacturing expense tend to decrease as volume increases. Other portions of the variation in these expenses attributable to the effect of other factors may be explained by undertaking an examination of the more important items.

Table 40. Manufacturing Expense of 173 Creameries Classified According to Volume of Output, 1934

Manufacturing expense items	All groups	Group I	Group II	Group III	Group IV	Group V	Group VI*
	Cents per pound						
Packing supplies	0.482	0.548	0.513	0.562	0.475	0.421	0.405
General supplies .....	.175	.221	.202	.181	.188	.184	.136
Salt .....	.040	.067	.041	.046	.039	.032	.036
Fuel .....	.188	.329	.208	.188	.173	.165	.193
Power, light, water, and refrigeration	.152	.204	.177	.158	.148	.131	.142
Taxes .....	.086	.081	.103	.099	.095	.071	.059
Insurance .....	.046	.066	.064	.055	.041	.046	.028
Repairs .....	.072	.080	.081	.096	.070	.057	.049
Depreciation buildings .....	.094	.109	.113	.114	.098	.083	.060
Depreciation equipment .....	.168	.245	.217	.174	.182	.127	.132
Miscellaneous .....	.034	.052	.069	.037	.037	.020	.009
Total manufacturing expense ...	1.537	2.002	1.788	1.710	1.546	1.337	1.249

* For the size of creameries in each group, see Table 4.

Supplies.—Because the need for supplies such as packages, liners, acid, color, and salt tends to vary proportionately with output, the per unit cost of these items is not affected greatly by volume. In the case of supplies, especially packing supplies, large variations occur in per unit expense because of differences in prices paid for comparable items. These variations are due to such factors as differences in purchasing arrangements and differences in location. Some creameries are able to secure more favorable prices than others because their purchases are large enough to merit quantity discounts. Thirty-nine of the creameries tend to achieve the same advantage by pooling their more important supply purchases with neighboring creameries. A large number of creameries, 140 of those studied, secured significant savings on supplies by purchasing through a cooperative supply house. Sixty-one of these creameries indicated that they purchased from 75 to 100 per cent of their supplies in this way. Some creameries secured lower prices because they were in a position to take advantage of cash discounts. Differences in the location of creameries had an effect on supply costs, because freight and drayage were included as part of the expense in each case.

The amount and kind of supplies used appear to be as important factors as volume and price in explaining per unit expense variations.

Creameries with large local and patron butter sales tend to have higher package costs because this butter is generally put up in one-pound prints requiring individual wrappers. When butter is shipped, the kind of container used gives rise to variations in packing expense. Of the creameries surveyed, 132 were shipping butter in tubs, 36 in paper boxes, five in wooden boxes, three in parchment-lined wire containers, and nine in pound prints which were in turn packed in wooden or paper boxes. Creameries which had shifted to the use of paper boxes reported a considerable saving compared with the use of new or reconditioned tubs. Typical prices paid for paper boxes were 11 cents each as compared with new tubs at 42 cents and reconditioned tubs at 28 cents. The most extreme variations in packing supply expense were due to the fact that in 18 creameries all or nearly all of the packing materials were furnished by the butter purchaser. In these cases packing supplies often averaged less than one mill per pound and in one case were as low as 0.023 cent.

Fuel, power, light, water, and refrigeration.—Table 40 reveals that fuel, power, light, water, and refrigeration are subject to considerable variation because of the volume factor. In the case of fuel, costs declined from 0.329 cent per pound of butter made in Group I to half that amount in Group V. Differences in volume accounted for variations in power costs which are similar to those for fuel.

Other factors such as differences in the kind of cost elements used, differences in prices of these elements, and differences in their utilization explain a large portion of the cost variation found in each volume group. Much of the variation in fuel costs is explained by the kind of fuel used. Coal was used by 113 creameries, 7 used oil, 1 used gas, 13 used wood and coal, while 41 used wood. Creameries located in communities with plentiful supplies of wood were able to keep their fuel costs at relatively low levels as compared with those burning coal. Wood was obtained for as little as \$1.10 a cord by one creamery and for \$2.50 to \$3.50 a cord by 34 creameries. Coal prices varied from \$6.25 to \$10.50 a ton, depending upon the quality used, methods of purchase, the location of the creamery, and distance to trackage. Comparing fuel costs by districts, the highest fuel costs, 0.206 cent per pound, were incurred by 15 creameries located in the southwestern part of the state where all creameries used coal involving relatively high transportation charges. In contrast, eight northwestern creameries using wood locally supplied had fuel costs of only 0.135 cent per pound.

Power, light, and refrigeration expense vary with the kind used and cost rates. Of the 175 creameries surveyed, 152 used electrical power for all or a large part of their operations while 23 used steam power. Power costs of creameries using steam were very low or negligible, but their fuel costs were slightly higher.¹² Electric rates per kilowatt hour

¹² This is the case because creameries using steam power do not attempt to allocate the extra fuel expense involved to power cost.

varied considerably between creameries depending on local rates, quantities used, and the success of the creamery in bargaining for lower rates. The average rate per kilowatt for the largest number of creameries was between four and five cents. Eight creameries secured average rates below four cents. Refrigeration expenses varied because 136 plants operated ice machines while 39 used natural ice. Natural ice refrigeration was secured at very low per unit costs as compared with the interest, depreciation, repairs, power, and other outlays involved in artificial refrigeration. The per unit cost of artificial refrigeration tended to be large especially for the smaller volume plants.

Differences in utilization account for part of the differences in fuel, power, and refrigeration costs. Some of these arise from carelessness in plant operation, inefficient boilers or ice machines, and poor plumbing.

Building and equipment expense.—Building and equipment expense, including taxes, insurance, repairs, and depreciation, represents 17.6 per cent of operating cost (Table 39). These items vary greatly because of differences in volume, cost rates, and utilization. Such costs are relatively fixed, hence the cost per unit decreases rather significantly as volume increases.

The annual cost rates of the various building and equipment expense elements were subject to much variation. For instance, the annual taxes paid by these creameries varied from \$13 to \$979, with the average tax for all creameries amounting to \$310.

Taxes vary with assessed valuation and tax rates. The assessed valuation was affected by the investment in plant, assessor's appraisal, and location. The effect of location is suggested by the fact that 27 inland creameries had an average tax of \$59 compared with the general average of \$310. In per unit cost terms this was 0.027 cent for the inland creameries and 0.086 cent for all creameries.

The annual cost of insurance averaged \$168 per creamery. Insurance varies with the original cost of the plant, the degree of depreciation, fire protection devices maintained, type of construction, proximity to other buildings, kind of company in which insured, and the amount and kind of coverage.

The annual outlay for repairs tended to vary with the need of these repairs and the availability of funds for making them. While the average repair cost of all creameries was \$259, that of the nine smallest volume creameries, several of which confronted troublesome financial problems, was only \$79.

Depreciation on buildings and equipment, representing 9.8 per cent of all the operating costs of these creameries, varied with the original cost of the asset to be depreciated and the rate of depreciation. Original cost varied because of differences in construction, size, and price levels at which these items were purchased. Table 41 shows the actual percentages of depreciation taken on specified assets. The table reveals that approximately 25 per cent of the plants made no provision for the

depreciation of buildings and equipment. This gives rise to an understatement of costs and an overstatement of the amount earned on each pound of butterfat handled. Creameries neglecting their depreciation charge should recognize that such a policy amounts to paying out part of the capital to the patrons in higher butterfat prices. Since such a policy gives the producer higher butterfat prices than those justified by efficiency of operation, it may serve as an unfair competitive device. In order to keep the costs of these plants on a comparable basis in this analysis, an average rate of depreciation was taken on the fixed assets of the creameries which had not provided for this item in their operating statement. After this adjustment the average annual depreciation on the buildings and the equipment of these creameries was \$339 and \$606, respectively (Table 39).

Table 41. Classification of 175 Creameries According to the Per Cent of Depreciation Taken on Specified Fixed Assets, 1934

Per cent depreciation taken	Buildings		Machinery & equipment		Office equipment	
	Number reporting	Per cent of total	Number reporting	Per cent of total	Number reporting	Per cent of total
No depreciation	45	25.7	43	24.6	27	15.4
0.0- 0.9	3	1.7	.....	.....	.....	.....
1.0- 1.9	32	18.3	2	1.1	.....	.....
2.0- 2.9	44	25.2	10	5.7	2	1.1
3.0- 3.9	23	13.2	6	3.4	3	1.7
4.0- 4.9	16	9.1	9	5.1	3	1.7
5.0- 5.9	9	5.1	17	9.7	8	4.6
6.0- 6.9	2	1.1	15	8.6	4	2.3
7.0- 7.9	1	0.6	24	13.7	3	1.7
8.0- 8.9 .....	.....	.....	9	5.1	5	2.9
9.0- 9.9 .....	.....	.....	16	9.2	5	2.9
10.0-10.9 .....	.....	.....	16	9.2	36	20.6
11.0-11.9 .....	.....	.....	7	4.0	.....	.....
12.0 and above .....	.....	.....	1	0.6	6	3.4
No report .....	.....	.....	.....	.....	73	41.7
Total	175	100.0	175	100.0	175	100.0

Differences in the utilization of buildings and equipment account for important variations in per unit expenses. Effective utilization of physical facilities and other cost elements depends upon the adjustability of the size or capacity of these items to the volume of business or vice versa. Buildings and equipment are especially difficult to adjust in case they are too large for the volume of business handled. Many creameries have buildings and equipment, the capacities of which are far in excess of present requirements and often in excess of reasonable future requirements. Common reasons for such maladjustments are that the butterfat available was overestimated, increased competition for butterfat, and drought conditions. The result of inefficient utilization of buildings and equipment is that producers must bear high taxes, insurance, repairs, and depreciation expense on each unit of product delivered.

To compare the relative efficiency of creameries in the utilization of plant facilities, the ratio of the pounds of butter made to the investment in fixed assets was used. Table 42 shows that 82 creameries made from 8 to 18 pounds of butter annually with every dollar invested in plant facilities. One creamery utilized its plant so effectively that 83 pounds of butter were produced with every dollar of plant investment. In contrast, one creamery with a plant much too large for the volume of business made only five pounds. The effect of the differences in plant utilization is reflected in the average building and equipment expense. For the 13 creameries showing the poorest plant utilization, per unit building and equipment expense was 0.886 cent compared with 0.237 cent for the group of creameries showing the best utilization. Some creameries were able to improve the utilization of plant facilities, especially buildings, by undertaking by-product or sideline enterprises.

Table 42. Ratio of Pounds of Butter Made per Dollar of Fixed Assets in 173 Creameries, 1934

Pounds of butter made per dollar of fixed assets	Number of creameries	Building and equipment expense per pound
		cents
Less than 8.00	13	0.886
8.00-12.99	41	.670
13.00-17.99	41	.475
18.00-22.99	24	.432
23.00-27.99	21	.361
28.00-32.99	11	.358
33.00-37.99	8	.289
38.00 and over	14	.237

General and Administrative Expenses

General and administrative expenses consisting of directors' fees, office salaries, office supplies, telephone service, auditing, depreciation of office equipment, advertising, and donations amounted to 0.249 cent per pound, or 9.4 per cent of all operating costs of these creameries.

The variation in general and administrative expenses of these creameries is similar to that for labor and plant expenses, the highest and lowest in this case being 0.918 and 0.014 cent, respectively. Part of this variation can be explained by differences in the volume of these plants. The average per unit general and administrative expense was 0.329, 0.331, 0.289, 0.250, 0.213, and 0.164 cent, respectively, for Group I to VI creameries.

Other causes of variation in general and administrative expenses can be identified by examining the amounts, prices, and utilization of some of the more important component items included in Table 43. Office salaries, amounting to \$430 per creamery, were the largest item. These consisted mainly of payments to the operator, the bookkeeper, or other creamery officials for their services in keeping the accounts and records

of the association. Of 158 creameries from which bookkeeping costs were available, 16 paid less than \$150 annually for these services, 41 from \$150 to \$299, 40 from \$300 to \$449, 19 from \$450 to \$599, 20 from \$600 to \$749, 11 from \$750 to \$899, and 11 over \$900. The outlay for bookkeeping varied with the frequency of patron payments, the number of patrons served, the volume of local sales, the amount and variety of sideline and market milk sales, and the detail with which the fundamental accounting records were kept. The operator kept the books in 24 plants, the secretary in 70, regular bookkeepers in 55, secretary-treasurers in 20, and managers in 6. The larger volume plants devoted more attention than the smaller volume plants to the formal balance sheets and operating statements. According to Table 44, 47 plants prepared detailed operating statements each month as a further aid to management. Several of those keeping monthly statements were doing so as a requirement of a loan from the St. Paul Bank for Cooperatives.

Table 43. General and Administrative Expense of 173 Creameries, 1934

General and administrative expense items	Average	Per cent of total operating cost	Cents per pound of butter made
Directors' fees	\$126	1.3	0.035
Office salaries	430	4.5	.119
Office supplies	109	1.1	.030
Telephone and telegraph	29	.3	.008
Auditing	39	.4	.011
Depreciation—office equipment	19	.2	.005
Advertising and donations	16	.2	.004
Miscellaneous	132	1.4	.037
Total general and administrative	\$900	9.4	0.249

Table 44. Classification of 175 Creameries According to the Frequency of Preparation of Accounting Statements, 1934

Frequency	Balance sheet		Operating statement	
	Number	Per cent	Number	Per cent
Annual	114	65.1	110	62.8
Semi-annual	22	12.6	12	6.9
Quarterly	5	2.9	6	3.4
Monthly	17	9.7	47	26.9
None	17	9.7	.....	.....
Total	175	100.0	175	100.0

Interest on Loans

Because of the strong financial position of most of these creameries, interest payments amounted to only 0.034 cent for each pound of butter made, or 1.3 per cent of total operating costs. The average interest payment differed considerably for the various volume groups, the decline being less regular as volume increased than in the case of other operating expenses. For instance, interest amounted to 0.042 cent a pound in

The fact that the largest creamery of the group, with an output of 1,668,241 pounds, had the lowest cost per unit illustrates that a high degree of efficiency can be attained in plants approaching a 2,000,000-pound production. No single figure can be used to represent the most efficient size for all cases because that necessarily depends upon many varying conditions.

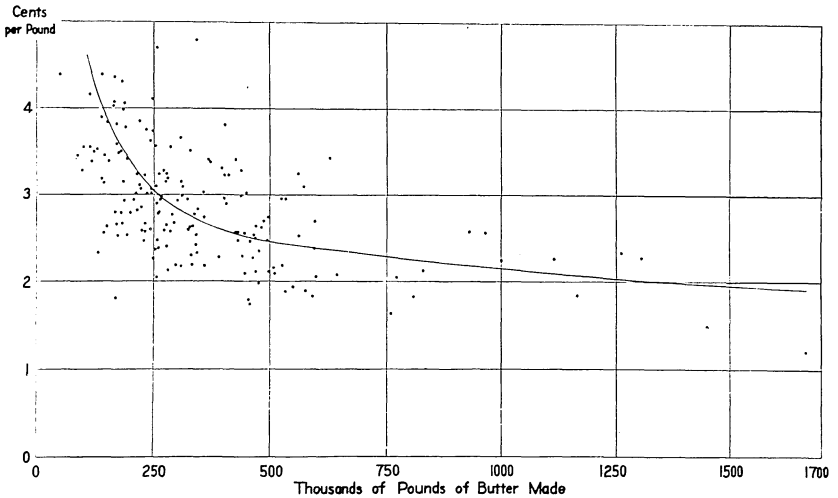


FIG. 7. RELATIONSHIP BETWEEN TOTAL OPERATING COSTS PER POUND OF BUTTER MANUFACTURED AND VOLUME OF OUTPUT IN 173 CREAMERIES, 1934

Relatively large decreases in per unit costs are experienced as the size of creameries increases to an annual output of 500,000 pounds of butter.

Suggestions for Improvements in Manufacturing Operations

1. Much of the improvement to be effected in plant operations depends upon the consolidation of a sufficient volume of butterfat.

2. A large share of the success of these creameries must be attributed to the ability of the operator and manager. Technological developments in the industry and increasingly complex business problems demand that only men of superior ability and training be employed to manage these plants.

3. Advantages to be gained by effecting economical arrangements for the purchase of creamery supplies have not been exhausted. Cooperative purchases of supplies through cooperative supply houses and by groups of creameries should be encouraged.

4. Reliable accounting and statistical information is indispensable in efficient plant management. By adopting the recommended uniform accounting system for Minnesota creameries, plant managers may obtain more information concerning their operating results and may more safely

compare their accomplishments with averages and standards established by other plants in the industry.¹³

MARKETING OPERATIONS

The efficiency with which creameries market their butter output is reflected in the net price received for butter sold. The average price received by these 173 creameries for all butter sold in 1934 was 24.309 cents a pound. Net prices received by individual creameries varied considerably from the average, ranging from a low of 22.965 cents a pound to a high of 25.707 cents. One hundred two creameries received a net price ranging from 23.75 to 24.50 cents a pound.

Some of the more important factors giving rise to these variations in butter prices are: Differences in (1) the volume of output; (2) markets in which butter is sold; (3) transportation costs; (4) sales agencies; (5) methods of packaging; (6) kind of butter; (7) quality of butter, and (8) variation in seasonal production.

The basic portion of the price received for each pound of butter is determined by price-making factors over which the individual creamery has no control; that is, the fundamental forces underlying the supply of butter and the demand. In a competitive market, it may be assumed that this portion of the price is the same for all creameries, and in consequence will not be considered in detail in this study.

Effect of Volume of Output on Price Received

According to Table 46, differences in the volume of output of creameries have a relatively minor effect on prices received for butter. The average price received on all sales shows that the creameries in the three largest volume groups enjoyed only a slight price advantage over creameries included in the three smallest volume groups. Further analysis of Table 46 shows that this advantage arises primarily from the fact that

**Table 46. Average Price Received for Butter in 173 Creameries
Classified According to Volume, 1934**

Group*	Number of creameries	All butter sales	Shipped sales	Local sales	Patron sales
Cents per pound					
Group I	9	24.189	24.024	25.570	24.836
Group II	53	24.050	23.815	25.618	25.421
Group III	50	24.020	23.789	25.355	25.334
Group IV	32	24.458	24.237	25.912	25.514
Group V	15	24.505	24.309	25.656	25.586
Group VI	14	24.565	24.453	25.594	25.484
All groups	173	24.309	24.114	25.626	25.448

* For the size of creameries in each group, see Table 4.

¹³ Information and assistance in the use of the uniform accounting system may be obtained from the Division of Agricultural Economics or the Agricultural Extension Division of the University of Minnesota. The Cooperative Auditing Division of the Minnesota Department of Agriculture, Dairy and Food also assists those desiring to adopt the uniform system of accounts.



the larger creameries receive a higher net price on butter shipped. This may be due to the willingness of certain buyers to pay more for a large supply of butter which is continuous and dependable. It may be due to other advantages often associated with larger volume, such as better quality and other factors discussed below.

Effect of Market Outlets on Price

Important variations in price received for butter may be explained by differences in the markets in which it is sold. According to Table 47, these creameries sold 6.5 per cent of the butter to patrons, 7.2 per cent to other local customers, and 86.3 per cent was shipped.

Table 47. Butter Sales of 173 Creameries, 1934

Market	Value	Quantities	
		Pounds	Per cent
Local	\$ 1,127,282	4,398,990	7.2
Patron	999,108	3,926,112	6.5
Shipped	12,665,848	52,525,634	86.3
Total	\$14,792,238	60,850,736	100.0

Butter sold locally.—The proportion of butter sold to local customers other than patrons is subject to considerable variation, ranging upward to 67 per cent of all butter sales in the case of one creamery. Four creameries sold more than 30 per cent locally, while two plants reported no sales to local non-patrons. In 50 per cent of the creameries less than five per cent of the butter was sold to local customers other than patrons.

The advantage in selling a large proportion of butter locally is the larger net price a pound that can be secured on this basis. Table 46 shows that on the average 25.626 cents was received for butter sold locally and 24.114 cents for butter shipped, a difference of approximately one and one-half cents a pound. By selling locally, freight charges and other selling deductions involved in shipping butter may be avoided. Some creameries gain a further advantage by selling butter which grades less than 92 or 93 in the local market at the same price as the better grades elsewhere, thereby securing top prices on virtually all sales.

Creameries arrive at prices to be charged local customers in a variety of ways. Usually, however, the prices are based on either New York or Chicago quotations, the price ranging from two cents under Extras to three cents over Extras. Eighty-eight creameries charged local customers the full New York Extra price; 33 charged less than Extras, while 9 charged more than Extras. Fourteen creameries based local prices on New York 93 score butter. Eleven creameries shipping into the Chicago market based local quotations on Chicago Extras. Most

of the remaining creameries based butter prices on butterfat quotations giving the creamery a higher price than that which could be netted in shipments to the central markets.

Butter sales to patrons.—According to Table 46, there was a net advantage of over one cent a pound in selling butter to patrons as compared with that obtainable by shipping. In Table 48 we find that 35 creameries charge patrons the net price obtained on butter shipped. In the largest number of cases, the price of butter to patrons is based on butterfat prices. Because of the overrun advantage, charging patrons straight butterfat prices gave the creamery a net price equivalent to one to three cents over New York Extras on the basis of 1934 prices. Patron butter prices two and three cents less than butterfat prices allow the average creamery a margin over the net price on shipped sales, because of freight savings of one and one-half to two cents, selling charge savings of approximately a half cent, and savings in packaging amounting to about three-quarters of a cent. The last-named saving often arises because patron butter is wrapped only in parchment paper without use of the more expensive waxed carton. Considerable amounts of patron butter are still sold in jars.

Table 48. Classification of 175 Creameries According to Basis of Determining Price for Patron Butter

Basis	Number of creameries	Per cent of creameries
Net return on butter shipped.....	35	20.0
Butterfat price	38	21.7
1 cent less than butterfat price.....	21	12.0
2 cents less than butterfat price.....	42	24.0
3 cents less than butterfat price.....	13	7.4
New York Extra price.....	8	4.6
1 cent less than New York Extra.....	7	4.0
Miscellaneous	11	6.3
Total	175	100.0

Shipped sales.—Since 86.3 per cent, or 53 million pounds, of the butter sold by these 173 creameries was shipped, it was variation in this portion of the sales which largely determined the net price received on all butter. Average net receipts on butter shipped varied from 22.657 to 25.618 cents, most creameries obtaining about 24 cents a pound net on butter sold in this way.

METHODS OF DETERMINING PRICES ON SHIPPED BUTTER.—A variety of methods were used in determining the *gross* price to be paid on butter shipped. In 73 cases the price was based on the New York Extra quotation on the day of arrival. Of these creameries, 45 received premiums over New York Extras varying from one-fourth to two cents a pound. The premiums were generally granted for such considerations as extra quality, special types of butter such as starter and unsalted butter, and

for butter packed in prints or other special packages. In 15 cases prices were quoted under New York Extras, but in these cases the buyer was either paying the freight and cartage or furnishing the packages and wrappers. Thirteen creameries received the straight New York Extra price. Only eleven creameries based prices on Chicago Extra quotations, nine of these receiving premiums and two discounts. Creameries selling through a cooperative sales agency received gross prices determined by pool receipts for the month.

EFFECT OF TRANSPORTATION COST ON NET PRICE RECEIVED.—One of the more important factors giving rise to variation in the average net price received on butter shipped is the cost of transportation. This cost depends upon the location of the market to which shipment is made, location of the creamery, and methods of transportation used.

Forty-seven creameries sell directly to New York butter firms and pay freight to that destination. Settlements with 91 creameries selling through a cooperative sales agency were made on the basis of delivery at New York, even though the butter may have been sold in other markets. Twelve creameries ship to Philadelphia, eleven to Chicago, three to Jersey City, two to Dubuque, one to Newark, one to Duluth, one to Washington, D.C., and one to Boston. Some creameries make a practice of sending part of their output to one market and the remainder to another. In such cases, only the major outlet was classified for the purpose of the accompanying table.

Table 49 shows the average freight deductions made in arriving at net prices on the butter shipped by creameries selling in two principal eastern markets. The table shows an extreme variation of almost a cent a pound for butter shipped into the New York market. Eleven creameries shipping to the Chicago market showed lower transportation costs per unit and less variation, the range of these costs being 0.45 to 0.60 cent a pound.

Table 49. Classification of 150 Creameries According to Weighted Average Freight Rate on Butter Shipped to Specified Markets, 1934

Rate	New York market	Philadelphia market
Cents per pound	Number of creameries	Number of creameries
1.10-1.29	7	3
1.30-1.49	17	6
1.50-1.69	30	2
1.70-1.89	37	1
1.90-2.09	5	.....
2.10-2.29	2	.....
No report	40	.....
Total	138	12

Some of the variation in freight rates on butter shipped to New York is due to differences in the freight rate zones in which the creameries are located. Between the extreme northwestern and extreme

southeastern shipping points this amounts to approximately 0.5 cent a pound.

Another cause of the variation in rates to New York is the fact that an increasing number of creameries ship their butter over the Great Lakes during the summer, thereby effecting an approximate saving of 0.2 to 0.3 cent a pound, as compared with the all-rail shipments. An increasing quantity of butter is being gathered in refrigerated trailer trucks and being delivered to Duluth, Minneapolis, and Milwaukee concentration points at a reported saving. In the southeastern part of the state, eight creameries trucked butter directly to the Chicago market at relatively favorable rates.

Most creameries which produced small quantities of butter effected important freight economies by pooling their shipments with others in order to avoid the high rates on less-than-car lots. Some of these shipping pools were arranged by the creameries themselves. This practice has been fostered on an extensive scale by a cooperative sales agency and by chain store buyers.

EFFECT OF SALES AGENCY ON PRICE RECEIVED.—Another factor affecting the net receipts from shipped butter is the difference in sales agencies which handled the butter of these creameries. Of 173 creameries, 90 were selling through a cooperative sales agency, 31 were selling to chain store organizations, 27 to eastern butter dealers, 18 to western dealers, and seven to meat packers.

Creameries selling through these various agencies showed considerable variations in the average net price received on butter shipped during the year. Part of this variation was no doubt due to differences in the marketing efficiency of these agencies, but no satisfactory generalization can be made on this from the data obtained in this survey. Much of the difference in the prices netted on butter shipped to the different agencies may be due to other factors described in this section, such as differences in quality, transportation costs, and volume.

EFFECT OF QUALITY ON PRICE RECEIVED.—That quality differences account for significant differences in the net price received for butter is shown in Table 50. Eighteen creameries which shipped from 90 to 100 per cent of 93 score butter netted approximately 0.722 cent a pound more than did seven creameries which had less than 40 per cent of 93 score butter.

Quality differences had much less effect on the prices received by the creameries which did not sell through a cooperative sales agency. Most of the butter sold by these creameries was paid for on a 92 score basis. A small percentage of the sales was made on a 90 and 91 score basis.

Some butter price variations are due to differences in the proportion of the total output which is sold during different periods of the year. In certain areas of the state, winter dairying has been more extensively developed than in others, making it possible for the creamery to obtain higher prices on a larger proportion of the total annual output.

Table 50. Relation between Price Received on Butter Shipped and Quality in 87 Creameries, 1934*

Per cent of 93 score butter shipped	Number of creameries	Average net price per pound	Price advantage due to higher quality of butter
		cents	cents
Less than 40	7	23.442	0.000
40- 49	10	23.441	-0.001
50- 59	8	23.438	-0.004
60- 69	5	23.624	+0.182
70- 79	19	23.819	+0.377
80- 89	20	24.065	+0.623
90-100	18	24.164	+0.722
Total	87		

* Creameries selling through a cooperative sales agency employing a Federal butter grader.

By-Product Sales

The income derived from the sale of butter was supplemented in varying amounts by the sale of by-products, principally liquid and dry buttermilk. Sales of liquid buttermilk varied from none in 13 creameries to \$2,400 in one plant. The largest number of creameries, 86, obtained between \$1 and \$300 for their buttermilk. The best returns for liquid buttermilk were obtained by nine creameries selling to a central drying plant. Sixteen creameries which dried their buttermilk sold from \$1,100 to \$5,600 of this product in 1934. Of 150 creameries which disposed of buttermilk to farmers, 28 were returning it free to patrons, 53 were selling it to the highest bidder or bidders, and 69 were selling to patrons at a specified gallon, can, or barrel price. Virtually, all creameries sold some buttermilk on a retail basis.

In 1934 only six of the creameries surveyed were receiving whole milk. This does not include creameries which purchased some whole milk for bottling purposes. All of these plants returned some of the skimmilk to patrons. Two plants were drying a major portion of it and two used some for casein. With temporarily improved dry milk markets in the early months of 1937, there were nine creameries receiving whole milk. Two were drying their own product and seven were sending their skimmilk to central drying plants.

With few exceptions, the drying departments are poorly organized from the economic viewpoint. Little is known about the exact costs and net results of drying operations, primarily because of the difficult cost allocations involved. The indications are that only the large-volume, well-capitalized, and efficiently managed plants are in a position to undertake the risks involved in drying their own milk products.

Sideline Enterprises

An important phase of creamery development in recent years has been the rather large-scale adoption of sideline enterprises. This development may be attributed to several causes. Facing increasingly

severe competition for butterfat, some creameries adopted sidelines so that earnings from this department might be used to supplement butterfat prices. Other creameries adopted sidelines in order that some of the overhead costs of the butter department might be shifted to the sideline department, also with favorable effects on butterfat prices. Some undertook a sideline business in order to meet the competition of cream stations and produce companies which often attracted considerable quantities of butterfat because they were also prepared to provide the farmer with marketing services for his poultry, eggs, and other produce. Many associations adopted sidelines mainly to give producers the advantages of cooperation on more of the items which they market and purchase.

The rising importance of sidelines is indicated in Table 51, showing within what period the sideline comprising the largest percentage of such sales was adopted. In 51 creameries the largest sideline was started in the three years preceding 1934. In 99 creameries the largest sideline items were adopted since 1928.

Table 51. Classification of 175 Creameries According to the Period in which the Item Comprising the Largest Percentage of Sideline Sales was Adopted

Period of adoption	Number of creameries	Per cent of creameries
In 1934	2	1.1
1931-1933	51	29.2
1928-1930	46	26.3
1925-1927	18	10.3
1922-1924	11	6.3
Before 1922	20	11.4
No report	27	15.4
Total	175	100.0

The sideline enterprises of Minnesota cooperative creameries may be classified into three groups: (1) Market milk and cream; (2) supply purchases for patron, and (3) produce sales for patrons. A list of the major sideline items and the number of creameries handling each is included in Table 52. This table reveals that 127 creameries sell milk and cream in the community. Of these, four ship milk and cream to the larger consuming centers. In the supply purchase group, cheese and various dairy supplies such as milk cans, strainers, coolers, and salt are handled most frequently. Poultry and eggs represent the most common type of produce business. This type of sideline enterprise was adopted mainly by creameries in the western and northwestern part of the state. There are innumerable combinations in which these items are handled, some creameries dealing in only one item, such as cheese, while others handle virtually all included in the above list. Indicative of this variety, one of the creameries surveyed handled most of the sidelines listed above, operated a feed mill, and sold a full line of poultry and livestock remedies.

Table 52. Classification of 173 Minnesota Cooperative Creameries According to Kinds of Sidelines Handled, 1934

Sidelines handled	Number of creameries
Market milk and cream	127
Supply purchases:	
Cheese	135
Dairy supplies	114
Flour and feeds	60
Seeds	14
Coal	14
Twine	13
Ice cream	7
Petroleum products	6
Groceries	4
Baby chicks	2
Miscellaneous	23
Produce sales:	
Poultry	29
Eggs	22
Hides	9
Wool	5

Volume of sideline sales.—The relative magnitude of the 1934 sideline sales of the creameries included in this study is indicated in Table 53. Sideline sales, exclusive of the market milk and cream business, amounted to more than a million dollars, or 6.5 per cent of all the sales of these creameries.

Table 53. Sales of 173 Creameries, 1934

Type of sale	Amount	Per cent
Butter	\$14,792,238	90.5
Buttermilk (liquid and dry)	119,977	0.7
Milk and cream	378,999	2.3
Sidelines	1,057,300	6.5
Total	\$16,348,514	100.0

There are considerable differences in the total amounts of the sideline sales of the various creameries (Table 54). Nine creameries reported no such sales, while 29 others reported sales of less than \$500 annually. In contrast, a group of 16 plants indicated sideline sales in excess of \$25,000 and ranging upward to \$129,000.

Analysis of the sales of the more important component sideline items reveals that in 46 creameries there were no sales of milk and cream. In 104 other creameries these sales amounted to less than \$1,000 annually, representing primarily cash and carry sales to local customers. Sixteen of the plants with milk and cream sales over \$1,000 maintained milk delivery routes. The three creameries with sales over \$25,000 were shipping milk and cream to the Twin Cities.

Table 54 shows that more creameries handled cheese than any other sideline item. Most of this business was merely on an accommodation

basis. In no case did these sales exceed \$5,000. Dairy supplies used by farmers were handled on a similar basis, the sales in no case exceeding \$3,000.

Although fewer creameries handled flour, feeds, poultry, and eggs, those which did generally had a large sales volume. In four cases creameries reported poultry business in excess of \$25,000, ranging upward to \$64,000 in one instance. The largest sale of flour and feed amounted to \$59,000 in one central-western creamery.

Table 54. Classification of 173 Minnesota Cooperative Creameries According to Amount of Sideline Sales, 1934

Sales in dollars	Total sideline sales*	Milk and cream sales	Cheese sales	Dairy supply sales	Flour and feed sales	Poultry sales	Egg sales
				Number of creameries			
None	9	46	39	61	115	144	151
0- 499	29	86	54	43	3	1	1
500- 999	31	18	39	12	2	0	0
1,000- 1,999	26	7	17	6	7	2	4
2,000- 2,999	5	1	2	5	1	3	0
3,000- 3,999	8	2	1	0	3	3	1
4,000- 4,999	5	1	1	0	0	4	2
5,000- 9,999	18	6	0	0	11	6	6
10,000-14,999	8	2	0	0	7	3	3
15,000-19,999	11	0	0	0	3	0	0
20,000-24,999	4	1	0	0	1	0	0
25,000 and over	16	3	0	0	2	4	0
No report or not segregated†	3	0	20	46	18	3	5
Total	173	173	173	173	173	173	173

* Including milk and cream sales.

† Some creameries did not report sales by individual sideline items but reported all sideline sales in combination.

Sideline costs.—The true expense involved in the sideline business was often difficult to ascertain because of inadequate accounting and because of faulty cost allocations. In a large number of cases, the sidelines adopted were of the type that involved no additional out-of-pocket costs but made possible a fuller utilization of the labor, buildings, and equipment used in the manufacture of butter. For instance, 88 creameries used no labor beyond that required in buttermaking, and 122 used no added buildings and equipment for sideline operations. Of those hiring extra labor, 64 hired men on an hour or part-time basis, and 19 hired one to three full-time men for this purpose. Where extra building and equipment were required, the resulting expense was generally minor, being the depreciation, taxes, interest, and insurance on a warehouse valued at less than \$2,000 in 37 out of 39 cases.

In order to obtain farm supplies at the lowest possible cost, 111 of these creameries purchased all or a large portion of their sideline items through central cooperative purchasing agencies. In this way, the creamery could obtain the advantage of large-scale purchasing for their patrons and could also share in the earnings of the central cooperative.

Net earnings on sidelines.—Net earnings on sideline enterprises varied considerably, depending upon policies with regard to selling prices and cost allocation. Policies with regard to both tended to depress earnings. Sixty-six associations aimed to handle sideline business as near cost as possible. Eighty-seven took profit margins varying from a fraction of a per cent to 25 per cent. In making cost allocations between the butter and sideline departments, the general tendency was to favor the former. As a result of these policies, seven creameries showed a net loss on sideline business, 86 showed negligible gains ranging upward to \$200 a year, 45 showed net earnings from \$200 to \$1,000, and 11 showed earnings in excess of \$1,000. Flour, feed, and poultry business contributed most to net earnings in a large number of cases.

Most of the creameries used their sideline earnings to improve butterfat prices. Only four creameries disposed of these earnings on an equitable cooperative basis; that is, through patronage dividends on sidelines.

Place of sidelines in the creamery business.—Most creamery managers were enthusiastic concerning the success of their sideline program. This is indicated by the fact that 26 were making plans to add new sidelines in 1935 and 1936.

Although the development of more sideline business has brought a large advantage to many creameries, this may not be true for all creameries which undertake it or for creameries which hope to gain the same degree of advantage by expanding the present sideline program. Whether or not sidelines should be adopted in a given case will depend upon: (1) The status of internal operating conditions, and (2) provisions for these services by other institutions in the community.

From the standpoint of internal operations, a point of maximum advantage is soon reached in the addition of sidelines in some creameries. This may be true because the operator is not qualified to manage a more varied and complicated business, or it may call for skills he does not possess. Taking on more sidelines may give the present helper more than enough to do and yet may not be important enough to warrant adding more employees. The same problem applies to the use of plant facilities. Careful consideration should be given to adding sidelines which can be coordinated readily with the main enterprise—butter-making. Sidelines which increase the demand for labor at peak periods of operation in the butter department should be avoided. Sidelines such as the sale of petroleum products should not be encouraged because they necessitate too many interruptions of regular work and endanger the requirements of creamery cleanliness.

Cooperative creameries contemplating the expansion of their sidelines should consider the advisability of duplicating the services of other cooperatives in the community. There are several cases in which duplications of this kind created more friction than the added advantages were worth.

Other Income

These creameries derived some income from sources other than the sale of commodities mentioned above. In some cases, substantial amounts were received in the form of interest on deposits, interest on certificates of indebtedness, and dividends on stock owned in other organizations.

RELATION OF OPERATING FACTORS TO BUTTERFAT RETURNS

Returns Available on Butterfat

Variations in the efficiency with which creameries conduct their manufacturing and marketing operations are finally reflected in general creamery efficiency, which is measured by the net returns available on

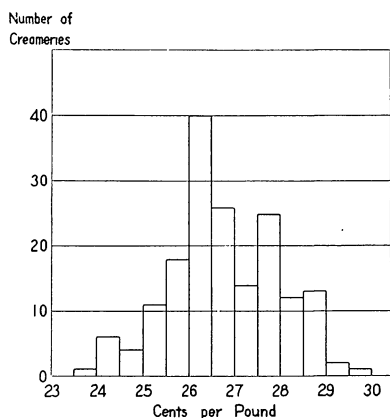


FIG. 8. AVERAGE NET RETURN AVAILABLE PER POUND OF BUTTERFAT HANDLED IN 173 CREAMERIES, 1934

The range of returns available on each pound of butterfat handled was 23.970 to 29.935 cents. The usual return was from 26.00 to 26.50 cents.

It is of interest to note that prices actually paid for butterfat by these creameries varied less, being 25.804 cents for the smallest creameries and 27.978 for the largest. Small creameries tend to overpay and tend to make little or no provision for expansion. Larger creameries tend to leave an undistributed balance for future payment or for capital expansion.

Effect of costs on butterfat returns.—The influence of costs on the returns available for butterfat is indicated in Table 56. The 11 creameries with total operating costs of less than two cents a pound of butter manufactured had 28.174 cents a pound of net return available on the butterfat they handled. As the operating cost increased, the re-

turns available on each pound of butterfat handled. The average net return for these 173 creameries in 1934 was 27.405 cents per pound of butterfat. The range of returns was from 23.970 to 29.935 cents. The usual return was from 26.0 to 26.5 cents (see Fig. 8). These variations are due principally to differences in (1) volume, (2) operating costs, (3) prices received for butter, and (4) overrun.

Effect of volume on butterfat returns.—Table 55 shows the direct relationship between volume of output and returns available on butterfat handled. The nine creameries with the smallest volume had 25.635 cents available on each pound of butterfat compared with 28.448 cents available in the 14 largest volume creameries, a net difference of approximately three cents. It is

turn on each pound of butterfat decreased, until the creameries with costs in excess of four cents a pound had only 24.976 cents available. This relationship between creamery costs and butterfat returns emphasizes the fact that improvements in the manufacturing efficiency of creameries may give rise to important improvements in the prices which can be paid for butterfat.

Table 55. Average Net Return Available on Butterfat Handled and Average Prices Actually Paid for Butterfat in 173 Creameries Classified According to Volume, 1934

Group*	Number of creameries	Average price actually paid for butterfat	Return available per pound butterfat
		cents	cents
Group I	9	25.804	25.635
Group II	53	25.832	26.069
Group III	50	26.845	27.128
Group IV	32	27.062	27.415
Group V	15	27.717	27.983
Group VI	14	27.978	28.448
Total	173	27.081	27.405

* For the size of creameries in each group see Table 4.

Table 56. Relationship between Creamery Costs and Returns Available on Butterfat Handled in 173 Creameries, 1934

Total operating cost per pound	Number of creameries	Average cost per pound	Return available per pound butterfat
cents		cents	cents
Less than 2.00	11	1.702	28.174
2.00-2.99	92	2.487	27.517
3.00-3.99	58	3.365	26.466
More than 4.00	12	4.485	24.976
Total	173	2.651	27.405

Effect of price received for butter on butterfat returns.—The price which creameries received for butter is one of the most important factors affecting the net return per pound of butterfat. Table 57 shows that the creameries netting more than 25 cents a pound had an average return available on each pound of butterfat of 28.387 cents, while those receiving less than 23.5 cents had an average of only 26.876 cents.

Effect of overrun on butterfat returns.—The relationship between overrun and the return available on butterfat is similar to the relationship just described for butter prices and butterfat returns. Low butterfat returns are associated with low overruns, and high returns on butterfat are associated with overruns approaching the 24 per cent legal limit. Most of the creameries surveyed had effected a very careful control of overrun, with the result that variations between creameries because of this factor were relatively minor.

Table 57. Relationship between Price Received for Butter and Returns Available on Butterfat Handled in 173 Creameries, 1934

Price received per pound	Number of creameries	Average price received per pound	Return available per pound butterfat
cents		cents	cents
Less than 23.50.....	11	23.296	26.876
23.50-23.99	40	23.734	26.253
24.00-24.49	76	24.206	27.181
24.50-24.99	24	24.666	28.091
More than 25.00.....	22	25.168	28.387
Total	173	24.309	27.405

Effect of well-balanced efficiency on butterfat returns.—The preceding analysis has shown that a large number of plants are very successful in one or more phases of their business but relatively inefficient in others. Such plants tended to secure only medium returns on their butterfat, while those which fell below the average in all phases of their operations tended to secure the lowest returns. The highest average butterfat returns were obtained by creameries with better than average results in all or a majority of the factors affecting creamery efficiency.

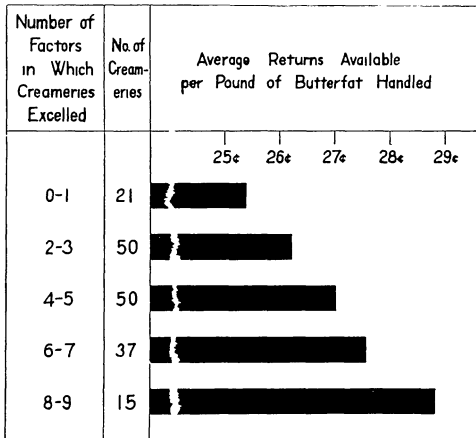


FIG. 9. BUTTERFAT RETURNS OF 173 CREAMERIES GROUPED ACCORDING TO NUMBER OF EFFICIENCY FACTORS IN WHICH CREAMERIES WERE ABOVE AVERAGE, 1934

The factors used in this comparison were volume, overrun, labor costs, manufacturing expense, general and administrative expense, interest expense, price received on butter shipped, price on local butter, and price on patron butter. Creameries excelling in eight or nine factors had approximately 3.36 cents more available per pound for butterfat payments than did those which excelled in only one or none of the factors.

pond of butterfat handled. In contrast, the 21 creameries which were superior in only one or none of the factors had only 25.40 cents of returns available for butterfat, or 3.36 cents per pound less than the plants demonstrating a more balanced efficiency.

to secure only medium returns on their butterfat, while those which fell below the average in all phases of their operations tended to secure the lowest returns. The highest average butterfat returns were obtained by creameries with better than average results in all or a majority of the factors affecting creamery efficiency.

Figure 9 shows to what extent the butterfat returns of the creameries which were above average in all, or nearly all, of the factors affecting efficiency exceeded the returns of those creameries which were below the average in several or all factors. The 15 creameries which excelled in eight or nine factors showed 28.76 cents of return available on each

Measuring Individual Creamery Accomplishments

The comparisons in Figure 9 emphasize the fact that creameries which aim to increase their available butterfat returns may effect important improvement by increasing their efficiency in the factors in which their achievements are below the average. In order that individual creameries may measure in what degree their accomplishments are above or below the average with respect to each of the more important efficiency factors, Table 58 is presented. The first column of this table shows the average accomplishments of all 173 creameries in the efficiency factors referred to in Figure 9. For those wishing to compare their results with other operating standards, Table 58 also includes the average results of the 30 creameries showing the highest butterfat returns and the 30 showing the lowest returns. From this table it may be observed that while the average available butterfat return of all creameries was 27.405 cents a pound, the average of the 30 highest return creameries was 28.609 cents and the average of the 30 lowest was 25.077 cents. The average cost of the 30 highest return creameries was consistently lower than the average for all creameries and the price received for butter was consistently higher. The average for the 30 lowest return creameries showed an exactly opposite relationship.

Table 58. Average Accomplishments of 173 Minnesota Cooperative Creameries in Various Factors Affecting Creamery Efficiency, 1934

Factor	Average of 173 creameries	Average of 30 highest return creameries	Average of 30 lowest return creameries
Butterfat returns (cents per lb.).....	27.405	28.609	25.077
Manufacturing factors:			
(1) Volume (lbs. butter manufactured)	353,089	626,856	199,346
(2) Overrun (per cent)	23.580	23.626	23.409
(3) Labor cost (cents per lb.).....	0.831	0.723	1.152
(4) Manufacturing expense (cents per lb.).....	1.537	1.239	2.108
(5) General and administrative expense (cents per lb.).....	0.249	0.179	0.387
(6) Interest on loans (cents per lb.).....	0.034	0.012	0.085
Marketing factors:			
(7) Price on butter shipped (cents per lb.).....	24.114	24.609	23.492
(8) Price on local butter (cents per lb.).....	25.626	25.741	24.872
(9) Price on patron butter (cents per lb.).....	25.448	25.616	24.643
Factors related to the above factors:			
(3), (4), (5), and (6) Total operating cost (cents per lb.)	2.651	2.153	3.732
(7), (8), and (9) Price received on all butter (cents per lb.)	24.309	24.743	23.698

Creameries which may wish to compare their accomplishments with others in the same general geographic location may refer to Table 59. This table indicates that the average available butterfat returns of 15 creameries located in the southeastern part of the state are higher than for any other area of the state. The 15 creameries located in the southwestern part of the state showed the lowest average return per pound

of butterfat handled. Table 59 shows that the southeastern creameries surpassed the creameries in the other districts in volume of output and in prices received for butter. The central western creameries, however, showed superior efficiency in their manufacturing operations, as evidenced by their lower total operating costs.

Table 59. Average Accomplishments in Various Factors Affecting Creamery Efficiency of 68 Minnesota Cooperative Creameries Classified According to Location, 1934

Factor	South-eastern creameries	Central western creameries	North-western creameries	North-eastern creameries	South-western creameries
Number of creameries in group	15	15	8	15	15
Butterfat returns (cents per lb.)	28.035	27.703	26.831	26.677	25.656
Manufacturing factors:					
(1) Volume (lbs. butter manufactured)	425,438	382,110	139,188	285,973	274,822
(2) Overrun (per cent)	23.643	23.582	23.660	23.642	23.400
(3) Labor costs (cents per lb.)	0.741	0.816	0.806	0.852	1.084
(4) Manufacturing expense (cents per lb.)	1.471	1.330	1.493	1.694	1.936
(5) Gen. and admin. expense (cents per lb.)	0.200	0.222	0.259	0.339	0.410
(6) Interest on loans (cents per lb.)	0.051	0.021	0.061	0.045	0.077
Marketing factors:					
(7) Price on butter shipped (cents per lb.)	24.578	24.439	23.735	24.127	23.523
(8) Price on local butter (cents per lb.)	25.810	25.455	25.032	24.588	25.235
(9) Price on patron butter (cents per lb.)	25.341	25.390	24.675	25.176	25.027
Factors related to the above factors:					
(3), (4), (5), and (6) Total operating cost (cents per lb.)	2.463	2.389	2.619	2.930	3.507
(7), (8), and (9) Price received on all butter (cents per lb.)	24.724	24.531	23.856	24.236	23.854

Summary and Conclusions

This study is based on data obtained from 175 cooperative creameries located in all parts of the state except the 13 northern counties and the Twin City area. These creameries manufactured an average of 353,000 pounds of butter annually, the output ranging from 45,000 to 1,668,000 pounds.

Virtually all of the creameries conformed to such universal cooperative requirements as the one-man-one-vote principle and the limitation of dividends on capital stock. With regard to control of the association by producers, many of these creameries failed to conform to federal cooperative specifications. Only 78 creameries showed that 90 per cent or more of their members were producers. Fifty-five associations, approximately one-third, paid federal taxes, indicating failure to meet federal tax specifications for cooperative associations.

The capital of these creameries averaged \$26,000 for each association and ranged from \$4,000 to \$85,000. Members and patrons provided an average of 87.2 per cent of this capital, including 46 per cent provided by surplus accumulations.

The patronage and volume of business of most of these creameries are limited by competing butterfat buyers located in their territories. It

is a common situation for creameries to have from three to seven competing buyers within a 10-mile radius. These duplications prevent many creameries from utilizing their plants and personnel fully and consequently result in higher costs per unit.

Transportation developments are changing butterfat assembly methods and are intensifying the competition for butterfat. In 117 out of 175 creameries, a considerable proportion of the butterfat is being assembled by trucks. One hundred thirty-six of the creameries studied have some type of competing buyer operating trucks within 10 miles of their plants. Truck competition often burdens the butterfat producer with the unnecessary cost of duplicated assembly services.

By using trucks in the assembly of butterfat some creameries may increase their volume and thereby reduce unit plant costs sufficiently to offset the added assembly costs. Plants with considerable unused capacity may obtain such an advantage. As volume is increased, unit plant costs tend to fall less and less rapidly, consequently creameries contemplating truck assembly should consider carefully the probable effect of added volume on plant operations.

Price paid for butterfat is the principal factor affecting the patronage of these creameries. It is a legitimate competitive practice for a cooperative creamery to obtain business by the payment of attractive prices for butterfat if it is able to do so because it has lower operating costs, or receives higher net prices for its butter or both. The creamery which pays higher prices than warranted by its efficiency dissipates its capital and may eventually be ruined if the practice is continued.

The most satisfactory measure of creamery manufacturing efficiency is the cost of manufacture per unit of product. Total costs in 173 creameries varied from 1.209 to 4.796 cents per pound of butter made. Increases in volume up to 500,000 pounds are accompanied by relatively large decreases in cost. The fact that the largest creamery with an annual output of 1,668,241 pounds had the lowest per unit costs illustrates that highly efficient operations can be attained in plants approaching a 2,000,000-pound production.

Average net prices received for butter sold varied from 22.965 to 25.707 cents a pound. Difference in the volume of output, proportion of butter sold locally, transportation costs, sales agencies, packaging, and quality of butter were some of the principal factors affecting the net price received for butter.

Sideline sales, including market milk and cream sales, constituted 8.8 per cent of the total sales of these creameries. Most creameries used earnings on sidelines to improve butterfat prices.

The final measure of the general economic efficiency of these creameries is the net return available on each pound of butterfat handled. This return varied from 23.970 to 29.935 cents. The usual return was from 26.0 to 26.5 cents.

The highest butterfat returns were obtained by creameries with better

than average results in all or a majority of the principal factors affecting creamery efficiency. This group of creameries had approximately 3.36 cents more available per pound for butterfat payments than did those which excelled in only one or none of the factors. Associations seeking to increase their available butterfat returns may effect an important improvement by increasing their efficiency in the factors in which their achievements are below the average.

It may be concluded that the cooperative creamery has been an important factor in the improvement of agriculture in Minnesota. The cooperative has improved the returns of the butterfat producer by manufacturing a high-quality product which has commanded a premium on the market. At the same time the cooperative creamery has been a means of combating inefficiency in the manufacture of butter, thereby reducing the costs of operation and the margins retained on each pound of butterfat handled.

Although cooperative creameries in general have achieved the purposes for which they were originally organized, there are indications that they are not adjusting their organizations and operations as readily as they should to important developments which the industry has experienced in recent years. Some creameries fall short of being fully cooperative and could with advantage improve upon their organization. The business records kept by creameries are not always adequate to supply the information needed for efficient operations. Improvements in transportation facilities have made it possible for a local creamery to serve a larger area than when they were first established. There is need for a consolidation of creameries for greater efficiency in operation in order that the net returns to the patrons may be increased. If the creameries are to adjust themselves successfully to ever-changing conditions, the understanding and support of well-informed producers and creamery officials are necessary. Individuals and agencies in a position to supply unbiased information and guidance in efficient creamery business organization and operations can be helpful to creameries in facilitating the required adjustments.

APPENDIX A

Conditions for Exemption from Federal Income Taxation

The basic conditions required for exemption from the payment of Federal income taxes are as follows:¹⁴

1. The association must be both organized and operated on a cooperative basis for the purpose of marketing products and returning the proceeds, less necessary expenses, to the producers on the basis of either quantity or value of the products marketed; or for the purpose of distributing supplies to farmers at cost plus

¹⁴ Knapp, J. C., and Lister, J. H., "Cooperative Purchasing of Farm Supplies," F.C.A., Coop. Div. Bul. 1, 1935. See p. 89.

necessary expenses. Of course, one association may engage in both activities.

2. Substantially all of the stock (except non-voting preferred stock, entitled only to fixed dividends and to redemption at the price for which issued) or of the voting memberships in nonstock corporations, must be owned by producers who patronize the association.

3. In regard to an association's marketing business, producers who are members and producers who are nonmembers must be "treated alike" with reference to patronage dividends. In regard to purchasing activities, all persons who buy supplies from or through the association, whether members or nonmembers, must be treated alike as to patronage dividends.

4. Associations organized with capital stock must not pay dividends on such stock, directly or indirectly, in excess of the legal rate of interest in the state of incorporation, or in excess of 8 per cent per year, whichever is greater, on the amount paid for the stock when it was issued.

5. At least 50 per cent in value of both the marketing and the purchasing business of the association must be done with members, and not more than 15 per cent of the purchasing business may be done with persons who are neither producers nor members.

6. Any reserves or surpluses set up by the association must be required by State law, or must be reasonable reserves for necessary purposes of the cooperative business.

APPENDIX B

Conditions to be Observed in Obtaining a Loan from the Banks for Cooperatives

Borrowers from the banks for cooperatives must meet the following definition of a cooperative association as given in the Agricultural Marketing Act, as amended by section 12 of the Farm Credit Act of 1935:

(a) As used in this act, the term "cooperative association" means any association in which farmers act together in processing, preparing for market, handling, and/or marketing the farm products of persons so engaged, and also means any association in which farmers act together in purchasing, testing, grading, processing, distributing, and/or furnishing farm supplies and/or farm business services:

Provided, however, That such associations are operated for the mutual benefit of the members thereof as such producers or purchasers and conform to one or both of the following requirements:

First. That no member of the association is allowed more than

one vote because of the amount of stock or membership capital he may own therein; and

Second. That the association does not pay dividends on stock or membership capital in excess of 8 per centum per annum.

And in any case to the following:

Third. That the association shall not deal in farm products, farm supplies, and farm business services with or for nonmembers in an amount greater in value than the total amount of such business transacted by it with or for members. All business transacted by any cooperative association for or on behalf of the United States or any agency or instrumentality thereof shall be disregarded in determining the volume of member and nonmember business transacted by such association.