

Patronage Problems of Mid-West  
Producers Creameries, Inc.



**PATRONAGE  
PROBLEMS OF  
Mid-West  
Producers  
Creameries, Inc.**

by  
Gordon C. Laughlin  
and  
T. G. Stitts

FARM CREDIT ADMINISTRATION

*Coöperative Division*

WASHINGTON, D. C.

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## SUMMARY

THE Mid-West Producers' Creameries, Inc., established in 1932 under the Indiana Cooperative Act, is unique among regional butter-marketing cooperatives in that it is primarily a service agency. Services rendered to its 20 member creameries in Michigan, Indiana, Tennessee, and Illinois include supervision of production methods, laboratory analysis of butter for quality and composition, arranging market outlets for butter, purchase of creamery supplies and equipment, representation of the member creameries in matters of public policy, assistance in corporate and financial reorganization of member units, and the keeping and analysis of their financial records.

Development of strong and effective locals, so that a minimum of responsibility remains with the overhead agency, has been a general policy of Mid-West. Particular attention has been given to operating efficiency and the manufacture of butter of a uniformly high quality.

Positive action to increase the number of active shippers and the interest of members in the creameries has followed three general lines:

First, the local creameries have acquainted producers with the advantages of cooperative effort and, specifically, the benefits to be derived from patronizing the particular cooperative in question. This has been accomplished through gaining the support of other farm organizations, holding meetings of present and prospective patrons, distributing literature and providing special field men for solicitation of cream and for quality improvement.

Personal contact with producers, made by drivers of cream-route trucks, is another important means of explaining the operations of the cooperatives.

Second, the creameries have substituted cream routes for cream stations and thereby have secured a closer relationship between the producer and the

creamery. During 1936, 88.6 percent of the butterfat received at all plants was procured on cream routes. Net returns to producers in general have been increased through the reduction of costs of assembly. The lowest cost of procurement for any association was 0.82 cent per pound of butterfat, and the average was 1.29 cents. Based upon the experience of a number of the plants, it is deemed advisable for additional creameries to consider the ownership of their own trucks.

Third, and most important in increasing patronage, is the ability of associations to return to their patrons high prices for their butterfat. Selected member creameries in Michigan and Indiana took a much lower margin than was taken on the average by all creameries in the State, therefore returning a higher proportion of the market value of the butterfat to the producers. The consistent increase in the volume of business done by cooperatives in these two States and the low margins taken by the cooperatives contributed to important reductions in the average margins taken between 1925 and 1936. The low level of operating costs has been an important factor in the building of support among patrons.

Creameries which are members of Mid-West vary widely in corporate and financial structure. Both stock and nonstock organizations are included. In Michigan 32 percent of the patrons were nonmembers, and 27 percent of the members were nonpatrons. In Indiana 81 percent of the patrons were members and 96 percent of the members were patrons. The three Tennessee creameries have recently been reorganizing to establish a closer relationship between patronage and membership.

The income of Mid-West is derived from dues which amount to one-eighth cent per pound of butter made by the member creameries.

*Patronage Problems of*  
Mid-West  
Producers' Creameries, Inc.

By GORDON C. LAUGHLIN  
*Associate Agricultural Economist*  
and

T. G. STITTS  
*Principal Agricultural Economist*

**I**MPORTANT changes have occurred in the dairy industry during recent years. Changes in marketing channels, with notable shifts of butter buying into the hands of large operators, have increased the demand for large volumes of standardized products. This volume has been provided either by increasing the size of the manufacturing units or through centralized selling on the part of a number of local creameries. Regional shifts in milk production and the relocation of manufacture of the various milk products have made, and are still making it necessary for local creameries to adjust their operations to advances and shifts in the industry. Improvements in transportation facilities have led to the widespread adoption in many sections of the truck-route system for assembling milk and cream, and this in turn has led to large-scale plant operations. Increased volume has necessitated new types of plant facilities and new processes for the efficient handling of the product.

These changes have brought problems of competition, mainly of two types: (1) That between the various dairy branches—for example, between buyers of milk for cheese making, for condensing, and for manufacture into butter; and (2) that between individual plants making the same product—for example, between local creameries.

To cooperative creameries these changing conditions have a double significance. Not only is the cooperative creamery subject to the same difficulties of adjustment in physical operations as other creameries, but the new conditions bring problems of internal organization which are of vital importance to the cooperative character of the enterprise. The concept of cooperation as a community enterprise in which neighbors work together toward a common end is no longer adequate when the cooperatives' operations extend over several communities. The personal basis of cooperation becomes harder to establish.

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NOTE.—Since the completion of this study, Mr. Laughlin resigned from the Farm Credit Administration to accept a position with the Oregon State Milk Control Board.

One of the primary problems in the management of cooperative creameries is to interpret correctly the trends of the industry and plan the necessary adjustments. Those associations able to anticipate the changes and to prepare themselves for the new conditions find themselves in a very strong competitive position. On the other hand, the inability of some associations to make such adjustments may cause failure or the serious curtailment of their effectiveness in increasing returns to producers.

Some of the questions faced by creameries today can best be settled by the individual associations. The responsibility for handling the business of a creamery, for example, rests entirely with the association concerned. On the other hand, there are many important problems which can be solved most effectively by a group of creameries acting together. Among these are standardization of manufacturing methods, purchase of supplies, competition between associations for butterfat and trade outlets for butter and byproducts, modern laboratory service for analysis of supplies and manufactured products, and the development of competent advisory services as an aid to the management.

To facilitate the solution of such problems local creameries, in some instances, have banded together and set up an overhead agency through which management policies of the group are developed, and operating practices determined. Such an organization is the Mid-West Producers' Creameries, Inc., an association of 20 cooperative creameries located in Michigan, Indiana, Illinois, and Tennessee.

## PURPOSE AND SCOPE OF STUDY

**T**HE PURPOSE of this study is to analyze the operations of the member associations of the Mid-West Producers' Creameries, Inc., and to ascertain how these associations have worked together for the solution of their mutual problems; also to ascertain the steps that have been taken by the creameries to increase their efficiency in operation and adjust their operations to major shifts in the industry, and to changes in the methods of butterfat procurement. Specific objectives of the study include: (1) To describe the activities and accomplishments of the overhead organization, the Mid-West Producers' Creameries, Inc.; (2) to analyze the production conditions prevailing in the regions where these creameries are located, in order that the reader may better visualize the type of association needed to render efficient service to cream producers; and (3) to appraise the operation and management problems of the 20 member creameries of the Mid-West.

Information was obtained through personal visits to the 20 member associations of the Mid-West Producers' Creameries, Inc. Those conducting the study had access to the records of the member creameries as well as those of the Mid-West Association.

## MID-WEST PRODUCERS' CREAMERIES, INC.

THE MID-WEST Producers' Creameries, Inc., has headquarters at South Bend, Ind. Of its 20 member creameries, 9 are located in Michigan, 7 in Indiana, 1 in Illinois, and 3 in Tennessee (table 1). Together the 20 creameries have over 30,000 patrons and, in 1936, made over 24,000,000 pounds of butter. The oldest member association was organized in 1897; the two newest, since 1930. The average age of all the associations at the time of the study was 16 years.

TABLE 1.—MEMBER CREAMERIES OF MID-WEST PRODUCERS' CREAMERIES, INC., 1937

Association	Location	Date organized	Volume of butter, 1936	Number of patrons, 1936	Butter-fat per patron, 1936 <sup>1</sup>
			<i>Pounds</i>	<i>Number</i>	<i>Pounds</i>
Atwood Cooperative Creamery.....	Atwood, Ill.....	1930	136, 094	300	371
Rutherford County Cooperative Creamery.....	Murfreesboro, Tenn.....	1913	1, 024, 990	2, 652	309
Nolensville Cooperative Creamery Association.....	Nolensville, Tenn.....	1921	385, 752	300	1, 023
Sumner County Cooperative Creamery Association.....	Gallatin, Tenn.....	1920	222, 017	250	710
Middlebury Cooperatives* Creamery Company.....	Middlebury, Ind.....	1921	2, 065, 479	1, 750	944
Producers Creamery.....	Marion, Ind.....	1925	2, 134, 763	3, 000	582
Farmers Produce Association, Inc.....	Crawfordsville, Ind.....	1933	2, 609, 751	5, 300	394
Producers Dairy Marketing Association, Inc.....	Orleans, Ind.....	1931	836, 976	2, 091	320
Farmers Marketing Association.....	Columbus, Ind.....	1923	3, 394, 122	4, 106	662
Farm Bureau Creamery.....	Portland, Ind.....	1934	613, 129	1, 200	409
East Central Cooperative Co., Inc.....	Rushville, Ind.....	1932	293, 142	450	521
Constantine Cooperative Creamery.....	Constantine, Mich.....	1915	4, 297, 507	3, 400	1, 011
Coldwater Dairy Co.....	Coldwater, Mich.....	1920	1, 184, 907	1, 208	785
Marcellus Cooperative Creamery.....	Marcellus, Mich.....	1920	475, 845	330	1, 153
Lawrence Creamery Co.....	Lawrence, Mich.....	1897	399, 995	405	791
Fremont Cooperative Creamery Co.....	Fremont, Mich.....	1904	548, 464	350	1, 254
Grant Cooperative Creamery Co.....	Grant, Mich.....	1910	226, 843	225	806
Farmers Cooperative Creamery Association.....	Nashville, Mich.....	1914	798, 765	840	752
St. Louis Cooperative Creamery Co.....	St. Louis, Mich.....	1915	1, 419, 689	1, 207	941
Dairyland Cooperative Creamery Co.....	Carson City, Mich.....	1925	1, 310, 612	1, 050	999
Total.....			24, 431, 844	30, 414	

<sup>1</sup> Butter per patron corrected for overrun.

The Mid-West Association began operating in 1932, with an original membership of five creameries located at Columbus, Orleans, Portland, Middlebury, and Marion, Ind. Creamery cooperatives in Constantine, Marcellus, and Lawrence, Mich., were the next to affiliate, followed by those in Crawfordsville and Rushville, Ind. Still later the local creameries in Coldwater, Carson City, St. Louis, Fremont, Grant, and Nashville, Mich., and Atwood, Ill., joined; and finally during 1935 those in Murfreesboro, Nolensville, and Gallatin, Tenn.

## CORPORATE AND FINANCIAL STRUCTURE

The association is incorporated under the Indiana Agricultural Cooperative Act (Burns' Ann. St. 1933, sec. 15-1601 et. seq.). It is set up on a capital-stock basis. The common stock is apportioned



among member associations at the rate of two shares with a par value of \$10 each for each 500,000 pounds of butter, or major fraction thereof, produced annually. Readjustments in stock ownership are made annually to maintain this proportion.

The common stock may be held by associations of producers of agricultural products only and it may be transferred only to such associations with the consent of the board of directors. No dividends may be paid on the common capital stock. At meetings of the stockholders the holders of common stock are entitled to one vote for each share of such stock held. An article of the bylaws provides that "this corporation shall not deal in the products of, or purchase supplies and equipment for, others than the holders of its common stock." The board of directors is composed of 12 members who are either officers or managers of the member associations.

### FINANCIAL CONDITION

A condensed balance sheet comparing the financial condition at the close of business October 30, 1936, and October 30, 1937, is shown in table 2.

TABLE 2.—CONDENSED BALANCE SHEET OF MID-WEST PRODUCERS' CREAMERIES, INC., AS OF OCT. 30, 1936 AND 1937

Item	Oct. 30, 1936	Oct. 30, 1937
<i>Assets</i>		
Current assets:		
Cash.....	\$13,404.87	20,004.98
Receivables.....	10,314.98	11,928.74
Merchandise inventory.....	17,821.40	24,356.17
Other assets; Investments.....	1,500.00	1,500.00
Fixed assets less depreciation.....	3,167.20	3,095.34
Total assets.....	46,208.45	61,146.23
<i>Liabilities and net worth</i>		
Current liabilities.....	7,787.61	13,549.88
Net worth:		
Capital stock.....	940.00	940.00
Assessment reserves.....	25,721.05	30,726.84
Current surplus.....	11,798.88	7,907.71
Total liabilities and net worth.....	46,248.15	61,146.23

Only a small part of the capital necessary for the association's operations is provided by capital stock. Income, both for current operations and for accumulations of capital, is derived from monthly dues assessed at the rate of one-eighth cent per pound of butter made by the member creameries. Except for small items of income derived from purchasing operations, these dues constitute the association's entire revenue. During the short period of its operation, however, the association has found income from dues adequate to pay all current operating expenses and to provide a substantial balance each year. This balance has been allocated to the members' reserve



FIGURE 1.—MODERN CREAM-RECEIVING ROOM OF THE FARMERS  
PRODUCE ASSOCIATION, CRAWFORDSVILLE, IND.

Cream from patrons must be weighed, sampled, and graded in the receiving room. The cans are washed and sterilized before they are returned.

accounts as "assessment reserves" on a pro-rata basis, but has been retained in the business for the purpose of building operating capital.

From time to time the association has found it necessary to supplement its capital by borrowing from the Louisville Bank for Cooperatives. The need for additional capital has arisen primarily from the supply-purchasing activities of the association. While the association owns no warehouses, it carries some supplies at points conveniently located throughout the territory. During some seasons of the year more supplies must be handled than at others, and at such times the financial requirements are correspondingly high.

The association's other activities have not thus far involved large accumulations of capital. The nature and extent of these activities have been conditioned by the funds available, and a policy of expanding on a pay-as-you-go basis has been established. For example, an increase in fixed assets during 1936 was occasioned by the installation of laboratory equipment for butter analysis.

### SERVICES TO MEMBERS

The primary objective of the organizers of the central association was to provide a selling service for the member associations. It was early recognized, however, that there was much preliminary work to be done before the member creameries would be in position to make

the best use of a central sales agency. Therefore it became the policy in the monthly meetings of the board of directors—where an unusually high percentage of the members have direct representation—to so plan the activities of the overhead organization as to deal most successfully with the current problems of the member associations. As need for new services appeared and as the older problems were either solved or reduced to routine operations, new activities were taken on. Thus, out of the original desire for a sales agency has grown a number of services designed to standardize the operations and the products of the member creameries at a high level (fig. 1). Those services may be grouped as follows: Marketing service, supervision of production methods, laboratory analysis of butter quality and composition, purchase of creamery supplies and equipment, attention to problems of public policy, reorganization of corporate and financial structures of member units, improvement of financial records and cost analysis.

### *Marketing Service*

The association does not take title to butter or other products sold for its members and makes no specific charge for its selling service. Its marketing service consists of seeking advantageous outlets for the products of the member creameries and arranging terms of sale which are submitted for acceptance or rejection by the members.

Under terms of the membership agreement the member creameries are free to do their own selling, and several have developed direct outlets to consumers or retailers without going through the usual wholesale channels. Even if the central association makes the original contract, subsequent negotiations between buyers and member creameries may be made without the assistance of Mid-West.

One feature of the selling work has been to protect the members' interests in the matter of overage required in each tub by the buyers. This average has been reduced in 3 years from as much as 8 and 10 ounces per package to 4 ounces per tub. As a result, approximately 1 pound of butter in each 200 pounds sold in tubs has been saved for the creamery, the value of which undoubtedly exceeds the total dues paid.

One important result of the marketing service has been to provide the member associations with knowledge of market conditions and available outlets. This knowledge has reduced the possibility of buyers' using the bids of one cooperative against another in such a way as to lower market returns. Furthermore, the pressure exerted upon prices by several creameries competing for local markets has been reduced by providing acceptable alternative outlets in other areas. Again, arrangements with financially responsible buyers who will take the entire output of the creameries have relieved the managers of the

local units of credit worries and the necessity of "jobbing" small lots to a number of outlets.

### *Supervision of Production Methods*

In supervising the plant operations of member associations, the ends sought are to increase efficiency, to improve quality and increase the uniformity of quality of each plant's output, and to standardize, as far as possible, the quality of product from the several plants. With these ends in view the association has provided technical production experts, capable of going from plant to plant and actually working with the operators on technical problems.

### *Laboratory Analysis of Butter Quality and Composition*

Initiated as a check on the effectiveness of plant technique and closely related to work in plant supervision is the service provided by the associations' butter-analysis laboratory. With present facilities and personnel the laboratory can handle samples of about 10 percent of each plant's production (fig. 2). These analyses are adequate to give the operators a check on their operations and an indication of desirable changes.

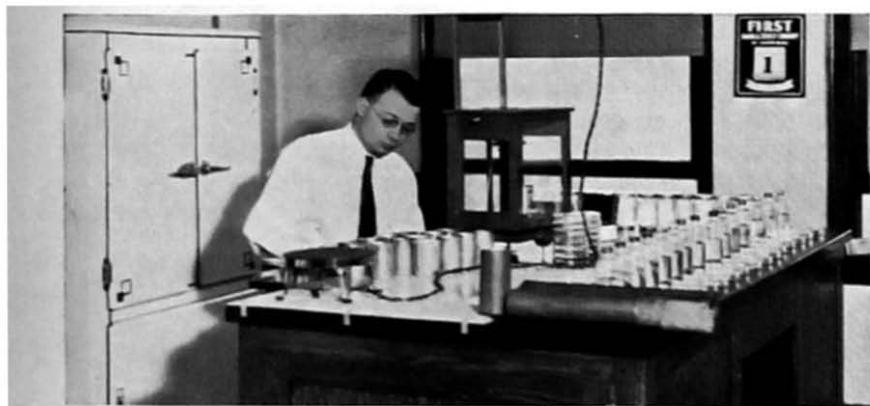


FIGURE 2.—CHEMIST ANALYZING BUTTER SAMPLES IN LABORATORY OF MID-WEST PRODUCERS' CREAMERIES, INC.

The laboratory furnishes a service which is of material assistance in the standardization of products manufactured.

Sterile sample jars are sent out from the laboratory to the various plants at regular intervals. When the sample is received from the creamery it is tested for composition, flavor, yeast and mold count, extraneous matter, and pH<sup>1</sup> determination.

The results of the laboratory analysis are returned to the member creameries in reports as illustrated below. The Mid-West stand-

<sup>1</sup> pH is the term applied to the hydrogen-ion concentration, which is a measure of acidity.

ard reflects legal requirements and market preferences and is the yardstick by which the samples are checked. With each of these reports is enclosed a criticism of samples and suggestions for improvement, followed later by field service from the central association.

### LABORATORY REPORT OF MID-WEST PRODUCERS' CREAMERIES, INC.

Creamery .....

Creamery No. -  
Date: Apr. 2, 1937.

Mid-West standard		16.1	80.5	2.5	0.9	Yeast and mold	Class
Sample No.	Condition	Percent moisture	Percent fat	Percent salt	Percent curd		
C-7	Good	16.23	80.59	2.5	0.68	4	1
135	Good	16.26	80.26	2.6	.78	4	2
145	Good	16.08	80.67	2.55	.70	4	1
147	Good	15.94	80.77	2.6	.69	2	1
155	Good	16.11	80.75	2.6	.54	4	1
159	Good	16.16	80.59	2.6	.65	2	1
161	Good	16.45	80.34	2.65	.66	2	1
170	Good	16.22	80.57	2.5	.71	6	1
174	Good	16.40	80.23	2.6	.78	6	3
181	Good	16.03	80.61	2.7	.66	6	1

Condition refers to method of obtaining sample, and to the condition of the samples on arrival at the Laboratory in South Bend.

#### CLASSIFICATION OF YEAST AND MOLD COUNT

0-10, Excellent.      26-50, Fair.  
11-25, Good.        51 and over, Poor.

A summary of all samples analyzed is made each month on a form similar to the one shown on page 9. This summary is prepared and distributed, so that individual creameries may compare their own achievements with those of other creameries. By comparing its own returns with the figures for the whole group, each association is able to check its progress toward the standards set up.

The results of the laboratory tests are checked against operators' churning records, plant equipment, and handling methods. Thus, the pH determination becomes a check on the effectiveness of various neutralizer methods and materials as well as upon the keeping qualities and general "character" of butter. Tests for extraneous matter in the butter are used in determining satisfactory production methods on farms. Quantitative analysis on moisture, butterfat, curd, and salt content check the legality of the product, the efficiency of churning methods, and the "shrink" in printing butter by various procedures. Yeast and mold counts are made as indications of the effectiveness of pasteurization and general sanitary conditions in the plant.

#### *Purchase of Creamery Supplies and Equipment*

The association is able to make substantial savings for members in the purchase of creamery supplies and equipment through buying and

MONTHLY SUMMARY SHEET OF BUTTER SAMPLES ANALYZED  
DISTRIBUTION OF SAMPLES ACCORDING TO MILK FAT CONTENT

	Fat content					
	Less than 79.49	79.50-79.99	80.0-80.49	80.5-80.99	81.0-81.49	Over 81.49
	Percent of samples					
March.....						
April.....						

DISTRIBUTION OF SAMPLES ACCORDING TO MOISTURE CONTENT

	Moisture content						
	Less than 15.0	15.0-15.49	15.5-15.99	16.0-16.49	16.5-16.99	17.0-17.5	Over 17.5
	Percent of samples						
March.....							
April.....							

DISTRIBUTION OF SAMPLES ACCORDING TO SALT CONTENT

	Salt content					
	Less than 1.5	1.5-1.9	1.95-2.30	2.35-2.70	2.75-3.00	3.05 and over
	Percent of samples					
March.....						
April.....						

DISTRIBUTION OF SAMPLES ACCORDING TO CURD CONTENT

	Curd content					
	Under 0.20	0.20-0.39	0.40-0.59	0.60-0.89	0.90-1.09	1.10 and over
	Percent of samples					
March.....						
April.....						

Yeast and mold per ce of butter

Extraneous matter

Class	Percent of samples		Class	Percent of samples	
	March	April		March	April
0-10.....			1.....		
11-25.....			2.....		
26-50.....			3.....		
51-100.....			4.....		
101-500.....					
501-1,000.....					
1,001-5,000.....					
Over 5,000.....					
Percent below 100.....					
Percent below 1,000.....					

transporting in large quantities. Of equal importance is the advice and assistance rendered in the choice of materials and equipment to assure quality and standardization of product.

Machines for eliminating some of the objectionable flavors and odors, which are traceable to the condition of cream from which the butter is made, have been installed by several of the member creameries. These machines are also flash pasteurizers and have the effect of speeding up plant operations and reducing required facilities for cream handling.

Aside from general creamery supplies, wrappers, and packages, the association purchases cans and creamery equipment. A special feature of the purchase program is to supply the member units with cream separators for resale to patrons. Separators are purchased in carload lots; 1,188 machines were handled in 1935.

### *Public Policy*

Both in Indiana and Michigan, the Mid-West Association is an important medium through which the cooperative dairy industry may be represented in matters of public policy. In industry programs such as the quality-improvement campaigns of recent years, representatives of the association are able to speak authoritatively for the organized dairy producers. The association works closely with general farm organizations and the State agricultural extension service in providing information and furthering the education of producers along cooperative lines. In national policies and programs, the association is represented through its membership in the National Cooperative Milk Producers Federation, an organization of 60 cooperative dairy associations marketing the product of more than 300,000 dairy farmers. This organization has headquarters in Washington, D. C.

### *Reorganization of Member Units*

Creameries which do not qualify as cooperatives under State or Federal statutes may be admitted to associate membership in the Mid-West association. They pay dues and receive the benefits of membership, except that they may not hold common stock and share in control. These associations are then given advice and assistance in reorganization so that they may become fully qualified member cooperatives. Several of the present members have received such assistance.

### *Analysis of Financial Records*

One of the important objectives of the association's service is the reduction of plant costs. In order that these might be studied more carefully the association has sponsored a cost analysis by a firm of

accountants and auditors. This service is provided with no direct additional cost to the members. The first step in the cost analysis was to provide the member creameries with a standard classification of accounts from which comparable data may be drawn. Not all of the member creameries have as yet adopted the standard forms, but enough have done so to indicate that desirable results may be obtained.

For those associations which keep sufficiently detailed cost data the accountants provide, for comparative study, cost analysis reports and a summarized report similar to the following:

"COMPARISON OF OPERATIONS" REPORT FORM OF MID-WEST PRODUCERS CREAMERIES, INC., 1935.

No.	Average selling price of butter	Gross proceeds per pound butter manufactured	Costs					Net proceeds per pound butterfat procured
			Procurement per pound butterfat procured	Manufacturing per pound butter manufactured	Selling and delivering per pound butter sold	Administrative per pound butter manufactured	Total costs per pound butterfat procured	
1.....	2 0.2543	3 0.2891	4 0.0139	5 0.0188	6 -----	7 0.0071	8 0.0062	9 0.3135
2.....	1 0.2854	1 0.4063	8 0.0413	8 0.0383	6 0.0079	9 0.0870	2 0.0870	2 0.3148
3.....	7 0.2759	7 0.2801	2 0.0106	2 0.0179	2 0.0033	1 0.0040	1 0.0423	5 0.3089
4.....	6 0.2731	9 0.2739	7 0.0271	1 0.0145	-----	7 0.0079	5 0.0556	6 0.2896
5.....	6 0.2821	6 0.2846	-----	-----	-----	-----	4 0.0516	6 0.2991
6.....	5 0.2825	4 0.2865	3 0.0120	4 0.0194	-----	3 0.0064	2 0.0439	4 0.3100
7.....	4 0.2830	5 0.2853	5 0.0204	5 0.0224	3 0.0074	2 0.0050	7 0.0637	7 0.2925
8.....	9 0.2715	8 0.2751	6 0.0214	6 0.0273	4 0.0099	8 0.0103	3 0.0831	9 0.2847
9.....	3 0.2842	2 0.3163	1 0.0094	7 0.0323	1 0.0029	5 0.0073	6 0.0625	1 0.3331
Average.....	.. 0.2792	.. 0.2904	.. 0.0174	.. 0.0311	.. 0.0053	.. 0.0064	.. 0.0544	.. 0.3035

1 Sold quantity of sweet cream at premium.

\* Procure whole milk as well as cream.

From these reports, the individual associations can determine wherein their costs appear to be out of line with similar items for other plants. Then, with the help of the accountants and service rendered by the central association, they can take steps to reduce such costs. In the same way, low costs on particular items serve to direct attention of all associations to methods used in obtaining them. The break-down of costs tends to emphasize the importance which the association places on efficient operation of the local creamery. A careful study of cost does much to explain why these creameries have grown consistently in volume of product handled.

Actual accounting procedure and audits are entirely under the control of the local units; the association acts only in an advisory capacity. For this reason, there is considerable variation in the type and adequacy of the accounts kept. However, the establishment of uniform practices in plant operations, the use of common product forms in recording those operations, and the use of standard classification of financial accounts should improve the general character of records kept.

It will be seen from the foregoing discussion that the activities of the Mid-West Association have been concerned primarily with sales,



plant operations, and public policies in which the members have a common interest. Except for general arrangements concerning trade areas the member creameries have largely been left to their own devices in working out their producer relations and cream-procurement problems. This situation is to be expected in an organization the members of which are scattered over a wide area and which operate under a variety of production conditions.

Before study of the various cooperative problems can be made it is necessary to understand the conditions of production and the general character of the dairy industry in the areas where the member creameries operate.

## CONDITIONS OF DAIRY PRODUCTION AND MANUFACTURE IN THE MIDDLE WEST

**T**HE SUCCESSFUL cooperative creamery must adjust its operations to the economic conditions in the territory in which it operates. It is important, therefore, in analyzing the operations of the Mid-West Producers' Creameries and in appraising the efficiency of its member associations, to investigate milk production in the area they serve. Likewise, it is necessary to understand the type of competition, market outlets, and method of collecting butterfat in the trade territory.

### PRODUCTION IN THE AREA

The first prerequisite for the successful operation of a creamery is an adequate production of butterfat. It is readily apparent from figure 3, which shows the location of the member associations of the Mid-West Producers' Creameries, Inc., and the 1934 density of milk production in its territory, that milk production is much heavier in southern Michigan and northern Indiana than in southern Indiana, east central Illinois, Kentucky, and Tennessee. Production in both of the former areas runs as high as 25,000 pounds per square mile annually, while in the latter areas densities of under 10,000 pounds are the rule.

For purposes of more general comparison, it may be noted that density of production in southern Michigan and northern Indiana is much the same as in northern Iowa. However, Michigan and Indiana together have but 3 counties in which production exceeds 20,000 pounds per square mile annually, while 44 of Wisconsin's 71 counties and 14 of Minnesota's 87 counties exceed that figure.<sup>1</sup>

Another factor of importance to the organization of the dairy industry is the trend or stability of milk production. There has been a slight increase in milk production in the last 10 years in the four States comprising the Mid-West Association's territory, but the variations

<sup>1</sup> U. S. Department of Commerce, Bureau of the Census, *AGRICULTURE*, 1935, v. 2.

are much less than those in the more intensive dairy States of Iowa, Wisconsin, and Minnesota. These changes in production from year to year affect the operation, particularly the plan of procurement.

Improved roads and truck transportation have made it possible to assemble butterfat by the truck-route system from much larger areas than could be covered under dirt-road transportation conditions. Local creameries now operate in areas where production is so sparse that formerly only cream stations could be operated.<sup>3</sup>

In centralizer territories served by the cream-station method, good roads and increases in milk production have worked together to cause an expansion in the number and size of local creameries. Improved transportation has made for fewer and larger creameries; but increased production has allowed many small creameries to maintain themselves or even to increase volume somewhat, even though they receive a lower proportion of the total butterfat produced in their areas.

Under conditions of reasonably stable production, additional butterfat supplies were not forthcoming to offset the effects of improved transportation. In Indiana production was not concentrated and the cream-station method of butterfat procurement was almost universal until roads were improved. After the roads were improved truck-route procurement was developed. From the data in table 1, it is evident that all of the Indiana cooperative creameries included in the Mid-West group were organized after 1920, and over half of them after 1930. Thus organization was approximately coincident with the increase of improved highways.

In Tennessee the creameries, for the most part, are located in the central part of the State in small valleys which were formerly semi-isolated. Most of the creameries, both independent and cooperative, were started prior to 1920, when their very isolation tended to assure them a volume of business. Improved roads and modern methods of transportation have made them readily accessible, but they have also brought the encroachments of truck routes from "outside" creameries. As a result, several of the smaller creameries have closed and others have lost much of their patronage to the stronger associations.

Michigan has been considered a dairy State over a long period of years and as such has a number of creameries organized before 1900. These early creameries were operated on a strictly "local community" basis. With the improvements in transportation after 1920, some of the creameries rapidly expanded their trade areas and their volumes of business. The result has been a very wide range in size of creameries.

<sup>3</sup> The cream stations are part of the system in which a centralizer creamery operates, or commissions others to operate cream-buying stations at a number of points. The purchases at the various stations are then "centralized" at the creamery by rail or truck. See Stitts, T. G. and Laughlin, G. C., ORGANIZATION AND OPERATING PROBLEMS OF NEBRASKA COOPERATIVE CREAMERIES, Farm Credit Administration, Co-operative Division Bull. 11, 56 pp, illus. 1937. P. 5.



GALLONS OF MILK PRODUCED PER SQUARE MILE, 1934  
IN MID-WEST PRODUCERS CREAMERIES TERRITORY

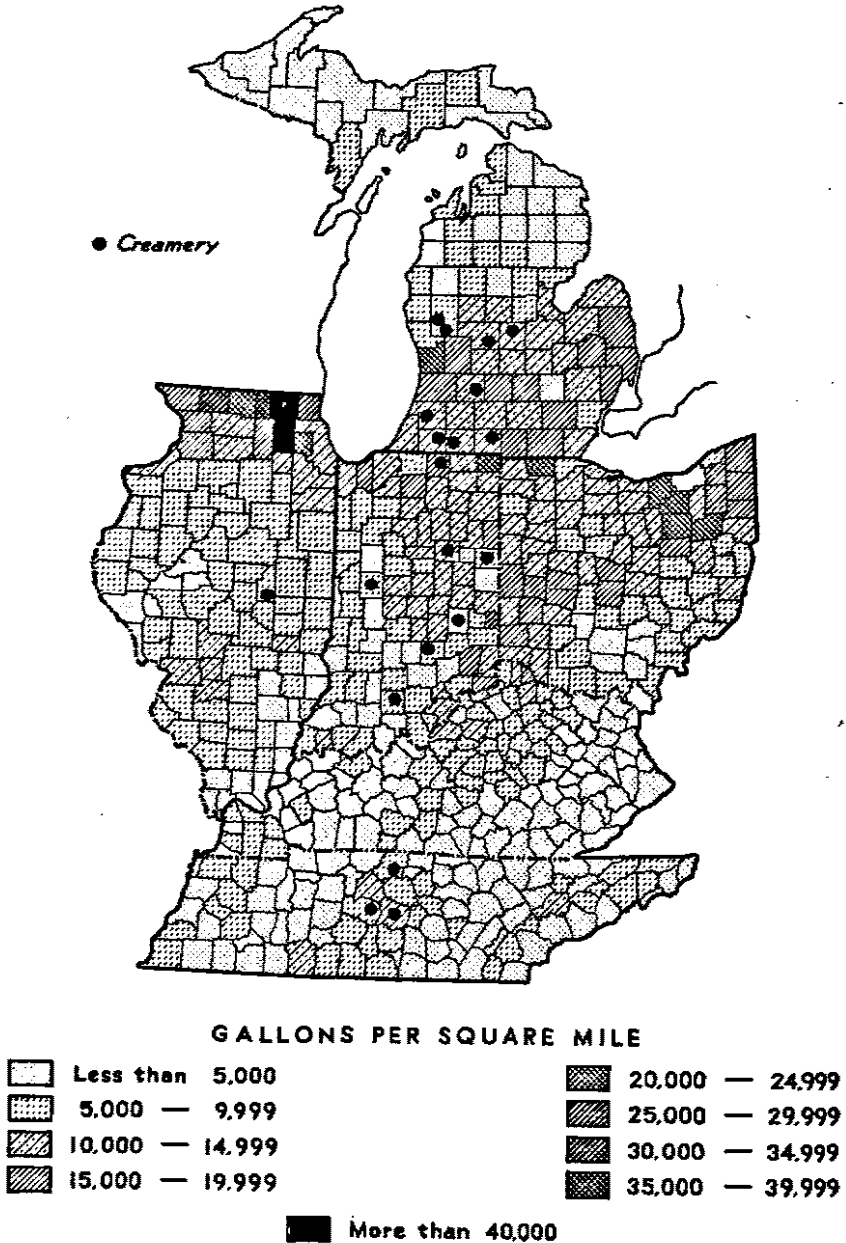


FIGURE 3.

## FARM CONSUMPTION OF MILK

In Michigan, Illinois, Indiana, and Ohio around 20 percent of the total production of milk is used on farms; in Kentucky and Tennessee, between 50 and 60 percent. These figures serve as an indication of the size of herds, since the smaller the herd the higher the percentage of production used for farm purposes. It is also an indication of the extent to which the dairy is maintained as a source of cash income.

The difference between cash income and gross income from milk (table 5) is further indication of the quantity of milk used on the farm. The cash income from milk is approximately half of the gross income from milk for Kentucky and Tennessee, from 80 to 85 percent for the rest of the Mid-West territory, and over 90 percent for Wisconsin, New York, and Vermont.

The place of the dairy enterprise in the entire farm operation and the extent to which the dairy production is for commercial sale, rather than for the subsistence of the farm family, have important implications in creamery operation and particularly in cooperative creamery operation. Support of a cooperative organization is most apt to be forthcoming when the income from products handled by the cooperative forms an important part of total farm income. Furthermore, when the product sold is simply a surplus over the farm family's needs, little attention may be paid to getting the maximum market returns from it.

TABLE 5.—GROSS FARM INCOME AND INCOME FROM MILK FOR SELECTED STATES, 1934 <sup>1</sup>

State	Gross farm income <sup>2</sup>	Gross income from milk	Cash income from milk	Percentage of gross income derived from milk	Percentage of gross milk income received in cash
	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>Percent</i>	<i>Percent</i>
Michigan.....	176,324	55,958	48,093	21.7	85.9
Illinois.....	308,657	69,962	58,263	22.6	83.2
Indiana.....	205,566	40,446	33,262	19.6	82.2
Ohio.....	249,425	84,395	52,501	25.8	81.5
Kentucky.....	143,779	24,995	13,116	17.3	52.4
Tennessee.....	141,578	19,602	9,528	13.8	48.5
Wisconsin.....	229,972	113,586	107,586	49.3	94.7
New York.....	262,820	121,422	112,302	46.2	92.4
Vermont.....	34,617	21,541	20,315	62.2	94.3

<sup>1</sup> Source: CROPS AND MARKETS, U. S. Department of Agriculture, Bureau of Agricultural Economics, July 1935.

<sup>2</sup> 73 crops and 13 livestock items combined.

## MARKET OUTLETS

The choice of market outlet is influenced by considerations of price and accessibility. In large measure milk is interchangeable in its uses so that the prices of milk going into various channels must be inter-related. From time to time there will be lags in the adjustment of prices for different manufactured dairy products.

Less than 10 percent of the milk in the four States is retailed by producers. This type of outlet is available to a limited number of producers because to take advantage of it the producer must be reasonably close to some town or city. Producer distribution is typically a small-town phenomenon. As a city increases in size and its milkshed is extended, the increased difficulties of individual producer deliveries make larger-scale operations advantageous.

The percentage of milk sold at wholesale for fluid purposes varies widely among the States, depending upon the relation between total milk production and urban population. Even though Indiana, Kentucky, and Tennessee have lower total production than Michigan, Illinois, and Ohio the general dearth of large cities in the former States gives them very low percentages of milk sold for fluid use.

After the demands of the farm itself have been met and all available markets for fluid milk, either sold wholesale or retailed directly, have been satisfied, the balance of milk produced must find its way into manufactured products. For the six States comprising, or contingent to the Mid-West territory, the percentage of total milk going into manufactured products varied from 28.4 percent in Tennessee to 62.5 percent in Indiana.

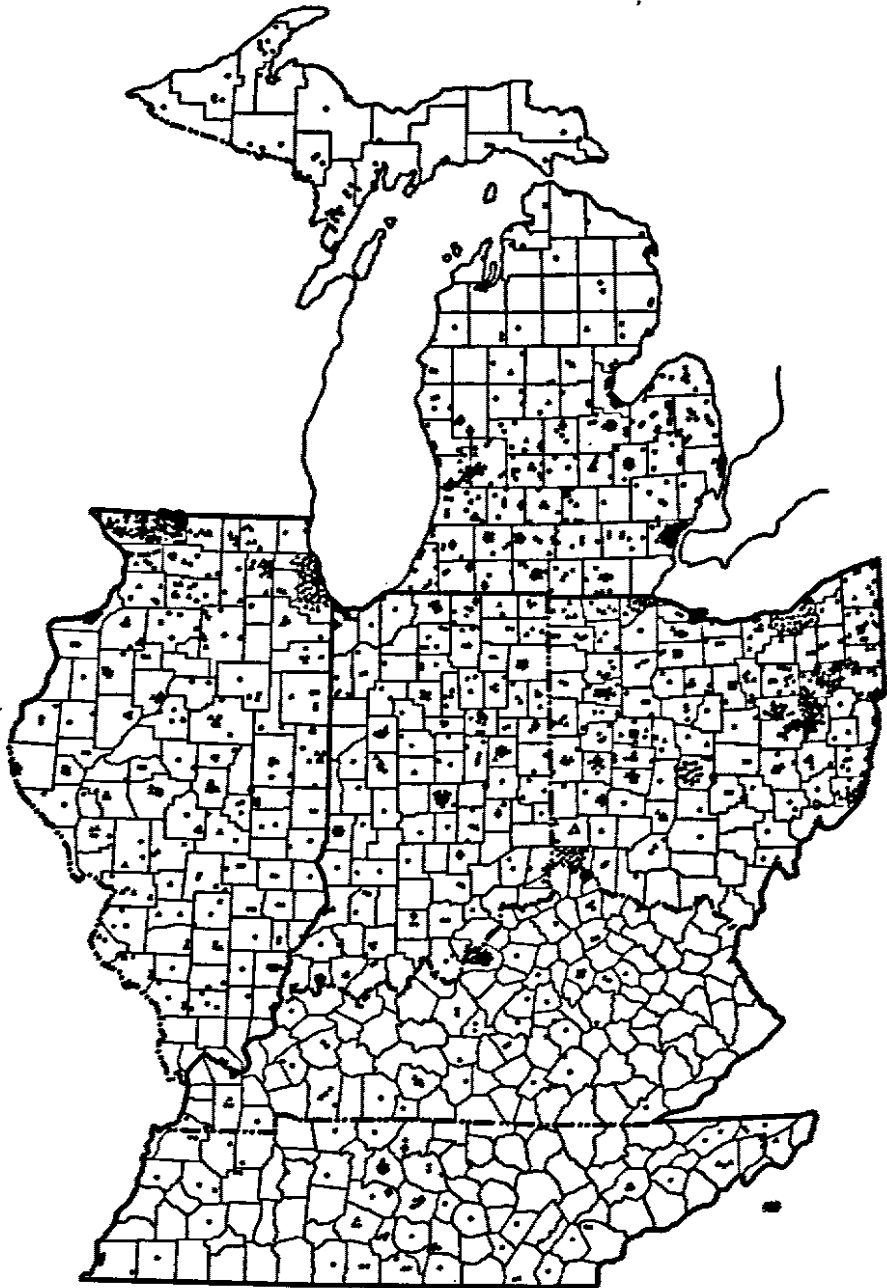
The location of facilities for handling the major manufactured dairy products (butter, condensed and evaporated milk, and cheese) are shown in figure 4. In most areas producers have alternative outlets for the milk which must go into some manufacturing channel. Creameries, cheese factories, and condenseries are interspersed over the whole area.

Under such conditions a number of factors affect the producer's choice of market outlets. The highest net return in money at the farm is his economic objective but this objective may be modified by considerations of convenience, the use of family labor, or established trade connections and farm practices.

Most, and until quite recently, all of the creameries of the Mid-West area were organized on a cream basis; that is, the butterfat was received in the form of farm-separated cream rather than whole milk. When choosing between the condensery or cheese factory on the one hand, and the creamery on the other, the producer's first decision was whether to sell cream or whole milk. In this decision he had to balance the advantage of a high whole-milk price at the factory against higher costs of transportation from the farm to the factory and the loss of the skim milk from the farm.

When farm management practices and enterprises have been organized by the producer to utilize skim milk on the farm, the price advantage in selling whole milk must be considerable to induce him to shift. This is especially true in areas such as the one under consideration because of the general farming or diversified enterprises on most

# LOCATION OF PLANTS MANUFACTURING DAIRY PRODUCTS, 1936



## TYPES OF PLANTS

● *Butter and Combined Butter  
and Cheese*

▲ *Condensery*  
◆ *Mid - West*

FIGURE 4.

farms. In the words of one creamery manager, "Competition from whole-milk buyers is no problem with 38-cent butterfat and \$10 hogs."

Net returns from condenseries, cheese factories, and creameries are thus kept in rather close agreement except for short-period variations. Consequently the proportion of total supplies going into the various manufactured products was rather constant for Michigan, Indiana, Illinois, Kentucky, and Tennessee during the 1929-35 period (table 6). The only product showing wide fluctuations is ice cream, the volume of which in all the States appears to have been closely related to general business conditions. The volume of ice cream, however, is so small a part of the total that increased demands for it were not of major importance in affecting the creameries except to provide a firmer demand situation for the whole field of dairy products.

TABLE 6.—MILK EQUIVALENTS OF PRODUCTS MANUFACTURED FROM MILK IN SELECTED STATES, 1929-35<sup>1</sup>

Item	1929	1930	1931	1932	1933	1934	1935
	<i>Million pounds</i>	<i>Million pounds</i>	<i>Million pounds</i>	<i>Million pounds</i>	<i>Million pounds</i>	<i>Million pounds</i>	<i>Million pounds</i>
<b>MICHIGAN</b>							
Butter.....	1,297	1,348	1,546	1,608	1,629	1,564	1,584
Cheese.....	94	81	86	73	98	106	120
Condensed and evaporated.....	221	201	202	198	238	210	236
Ice cream.....	237	203	185	152	141	162	201
Other.....	17	22	13	25	24	36	29
Total.....	1,866	1,855	2,032	2,054	2,130	2,078	2,170
<b>INDIANA</b>							
Butter.....	1,167	1,178	1,296	1,406	1,429	1,435	1,377
Cheese.....	97	114	141	147	167	224	212
Condensed and evaporated.....	159	212	160	145	132	143	153
Ice cream.....	82	78	61	48	45	50	56
Other.....	1	0	1	0	0	1	2
Total.....	1,506	1,580	1,629	1,744	1,773	1,853	1,800
<b>ILLINOIS</b>							
Butter.....	1,407	1,326	1,367	1,431	1,383	1,461	1,450
Cheese.....	120	90	85	108	160	199	242
Condensed and evaporated.....	262	220	223	230	270	278	287
Ice cream.....	305	294	241	171	156	182	183
Other.....	19	21	19	13	9	13	9
Total.....	2,113	1,951	1,935	1,953	1,978	2,133	2,171
<b>KENTUCKY</b>							
Butter.....	369	324	336	365	405	390	404
Cheese.....	12	17	19	25	31	34	48
Condensed and evaporated.....	57	54	57	71	74	86	102
Ice cream.....	44	37	22	17	15	17	21
Other.....	1	1	1	2	2	1	2
Total.....	483	433	435	480	527	528	577
<b>TENNESSEE</b>							
Butter.....	313	275	262	268	304	276	278
Cheese.....	22	23	24	27	30	38	70
Condensed and evaporated.....	99	98	79	76	85	86	95
Ice cream.....	30	26	25	19	19	25	29
Other.....	0	1	2	3	3	2	0
Total.....	464	423	392	413	441	427	472

<sup>1</sup> Source: MILK EQUIVALENT OF PRODUCTION OF MANUFACTURED DAIRY PRODUCTS BY STATES, 1929-35. [Processed.] U. S. Department of Agriculture, Bureau of Agricultural Economics.

There has also been a noticeable increase in cheese production in most of the States. This product, too, uses a small part of the total milk, but where the State increase has resulted from new cheese fac-



tories in particular areas, such as southwestern Indiana, it has provided a serious problem for creameries in those areas.

For the most part, however, there have been no major shifts in production of the various dairy products. About the same proportion of milk produced continues to be available to creameries for manufacture into butter. The major changes have taken place within the creamery industry itself.

A development within the industry which is not disclosed by the data of the previous tables is that of the increased use of milk by-products in the creameries and the shift from cream to whole milk deliveries to take advantage of profitable outlets for those products. The chief products of this change are powdered skim milk and powdered buttermilk. The annual production of these products for the United States and the Midwest territory is shown for the 1925-36 period in table 7.

TABLE 7.—ANNUAL PRODUCTION OF POWDERED SKIM MILK AND BUTTERMILK FOR SELECTED STATES AND THE UNITED STATES, 1925-36<sup>1</sup>

Item and year	Michigan	Illinois	Indiana	Tennessee	United States
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
<b>POWDERED SKIM MILK</b>					
1925	4,898	2,996			78,317
1926	9,994	2,072			91,718
1927	11,672	1,476		1,665	119,123
1928	14,245	3,184	284	2,575	147,996
1929	20,364	3,546	2,574	3,541	207,579
1930	24,373	5,100	1,660	4,168	291,075
1931	22,992	5,450	4,061	3,433	271,939
1932	21,519	3,503	4,651	3,651	270,194
1933	22,137	3,610	4,290	3,630	269,114
1934	27,175	4,209	4,553	4,059	294,935
1935	27,280	2,131	4,375	4,565	297,705
1936	24,737	2,035	5,966	4,390	349,550
<b>BUTTERMILK</b>					
1925	822	36	297		20,246
1926	865	211	715		21,378
1927	895	237	1,313		28,435
1928	1,206	624	1,356	195	45,692
1929	1,578	768	1,664	1	54,215
1930	2,283	728	2,147	66	64,901
1931	2,323	554	1,986	9	50,535
1932	2,196	1,079	1,912		48,712
1933	2,264	1,174	1,649	2	52,260
1934	2,567	1,721	1,634		62,536
1935	2,608	1,202	1,320	1	49,923
1936	2,998	551	1,530	506	50,781

<sup>1</sup> Source: U. S. Department of Agriculture, Bureau of Agricultural Economics, DRY OR POWDERED MILK STATISTICS, February 1937 (mimeographed).

It is apparent that production of milk powders during the period increased rapidly, particularly during the periods 1927 to 1930, and 1934 through 1936. Between 1930 and 1934 production declined. It is further apparent that the production decline or stagnation was more pronounced for the Midwest States than for the country as a whole. Explanation for this may be found in the combination of powder prices and ready alternative uses for skim milk in the Midwest area.

The relation between milk-powder prices and production in the four Midwest States during the 1925-36 period is shown in table 8. There was a continuous decline in powder prices from 1926 to 1932, but through 1930 the prices, though declining, were sufficiently high to induce the installation of more drying equipment. Prices for skim milk were high enough to cause producers to shift from cream to whole-milk deliveries.

TABLE 8.—MILK-POWDER PRODUCTION AND PRICES IN INDIANA, ILLINOIS, MICHIGAN, AND TENNESSEE, 1925-36 <sup>1</sup>

Year	Skim-milk powder			Buttermilk powder		
	Total production	Price per pound	Production index <sup>2</sup>	Total production	Price per pound	Production index <sup>2</sup>
	1,000 pounds	Cents	Percent	1,000 pounds	Cents	Percent
1925.....	7,884		29	1,165		29
1926.....	12,006	10.84	44	1,791	8.72	44
1927.....	14,203	9.28	52	2,574	8.48	64
1928.....	20,288	8.72	74	3,471	7.25	86
1929.....	30,025	8.02	110	5,851	6.85	96
1930.....	35,331	6.72	129	5,224	6.55	130
1931.....	35,966	4.24	131	4,871	3.64	121
1932.....	33,324	3.87	122	5,187	3.35	129
1933.....	33,657	5.13	123	5,130	4.34	127
1934.....	40,056	5.37	146	5,922	4.28	147
1935.....	38,331	5.91	140	5,130	4.64	127
1936.....	47,637	8.28	162	5,645	7.05	135

<sup>1</sup> Compiled from U. S. Department of Agriculture, Bureau of Agricultural Economics, DRY OR POWDERED MILK STATISTICS, February 1937 (mimeographed).

<sup>2</sup> Index with average for period as 100.

The situation in 1931-33 (table 8) illustrates two points. First, production tended to lag behind price changes. That is, production continued high in 1931 although prices had fallen to low levels, and continued low in 1933 after prices had advanced. Second, there was a marked difference in the reaction of skim-milk powder and buttermilk powder to the price changes (fig. 5). After buttermilk-drying equipment has been installed the production of powder tends to be proportionate to the production of butter, since the only alternatives to making the buttermilk into powder are to sell the buttermilk back to farmers as fluid or to dump it. In the case of skim-milk powder, on the other hand, the volume depends upon deliveries of whole milk by producers. Unless prices are satisfactory from the producers' point of view they may sell cream and retain the skim milk for use on the farm. In general farming areas such as that in which Mid-West operates there are ready alternative uses for the skim, and even during the period of low prices, farmers can use the skim milk to better advantage at home. However, after plants have been committed to whole-milk operations and producers have changed their farm practice to sell whole milk, there may be considerable lag in the shift back to cream.



FIGURE 5.—EQUIPMENT FOR DRYING SKIM MILK AND BUTTERMILK

Efficient creamery operation requires that all byproducts be manufactured. Dried skim milk and buttermilk have been profitable outlets.

The tendency of the effects of high prices to cause overexpansion of drying facilities has in the past resulted in a temporary excess of supplies over the market requirements and a consequent lowering of prices. This tendency has lessened, however, with the discovery of new uses for the byproduct, which, in turn, has created a broader basis of demand. As prices recover, the creameries with volume and equipment to take advantage of the byproducts market are in a very favorable competitive position. Those lacking this advantage may be forced in self-defense to diversify their operations to meet the situation. Once the shift from cream to whole milk has been effected at an individual plant, the next and logical step is for that plant to put in equipment to enable it to make alternative major products from the whole milk. By so doing, the larger plants put themselves in the best possible position to meet competition not only from other creameries but also from buyers of milk for other purposes.

As may be seen in figure 4, the members of Mid-West have to compete not only with condenseries and cheese factories but with other creameries. Thus, even after producers have decided to sell their products through a creamery rather than through some other channel, competition affects the volume of business.

Some variation in volume is apparent even for associations in the same area and especially for the three plants in Tennessee (table 1). On the whole, however, creameries under similar production condi-

tions tend to have similar average deliveries per patron. This average is highest in Michigan and northern Indiana, smaller for southern Indiana and Illinois, and larger again in Tennessee.

The average deliveries per patron are of major significance in the solution of the patronage and procurement problems of cooperative creameries. Deliveries of less than 400 pounds of butterfat per year mean that the average producer at those plants has only about 1 pound of butterfat per day over which to concern himself. While this is a daily average, the seasonal nature of production and complete cessation of production during part of the year probably means that such producers had larger daily deliveries during the period they patronized. Herds on the farms of such producers probably do not exceed three cows. On the other hand, deliveries at some of the plants would indicate herds of 12 or more cows as an average. It is probable that the attitude of producers toward their dairy enterprise and returns from dairy products varies under these differing conditions.

## STRUCTURE AND ACTIVITIES OF ASSOCIATIONS

### MEMBERSHIP POLICIES

THE SUCCESS of any overhead organization of cooperatives is finally dependent upon the efficiency of the member units. The Mid-West Producers' Creameries, Inc., is adequately financed and supported because its members have as a group been successful as cooperative and business associations. These creameries can afford to maintain a service organization which, if they were less efficiently operated, they might have to do without.

There is no single factor in management of a cooperative creamery that determines its success. As in any business, the long-time record of the association as a worth-while institution depends upon the proper coordination of many factors. One of the foundation stones of successful cooperative organizations, however, is presumed to be the active interest of members and patrons in accomplishing a specific result—the increase of net returns from the product handled. If the patrons' interest in that product is limited because it is not a major factor in his farm income, enlisting and maintaining sufficient producer support becomes a serious problem in the operation of cooperatives.

It has been noted (p. 3) that butterfat deliveries at the Mid-West member creameries vary from 1 to 4 pounds per day per patron. Under these circumstances, what provisions are made by the associations for making contacts with producers, enlisting their financial support, and obtaining their active participation in the conduct of the association's affairs?

*Michigan*

The 9 creameries located in Michigan, which are members of Mid-West Producers' Creameries, Inc., had in December 1936 a total of 8,033 members and 9,015 patrons; 27 percent of the members were nonpatrons, and 32 percent of the patrons were nonmembers. The individual associations differed widely in the extent to which membership and patronage were in accord. In one association 69 percent of the members were not patrons, and 95 percent of the patrons were not members; while, on the other extreme, in one association all patrons were members, and all members patrons.

The extent to which an association's membership is kept in accord with its patronage depends upon the policies the association follows in extending membership to patrons and in terminating the membership of those who cease to patronize. The Michigan associations surveyed may be grouped according to their membership policies as follows: (1) Those which have definite procedures for following both policies; (2) those which make members of patrons by specific procedures but do not terminate memberships systematically; and (3) those which follow neither policy. No associations were found which followed the single policy of terminating memberships of inactive members.

Only one association was found which had a definite procedure both for making members of patrons and terminating memberships of non-producers. This association made a capital deduction of 1 cent per pound of butterfat from the proceeds of all patrons' deliveries. The deductions were credited to the accounts of the patrons; and as soon as they totaled \$10, a certificate of common stock was issued to the patron. The deductions were continued from all butterfat shippers even after they had received their first shares and become members. Thus each producer provided capital in proportion to his use of the association. After the deductions had provided all the capital required in the operation of the business, the proceeds of further deductions were used to retire the oldest certificates of stock outstanding. Members who had ceased to ship, and so were not being issued new stock, had their old shares "called" and their memberships terminated. In this way, the capital of the association revolved every 3 or 4 years; new patrons attained membership as soon as they had shipped 1,000 pounds of butterfat; and inactive members were eliminated as fast as funds became available to liquidate their stock.

Three associations made capital deductions from nonmember cream shippers to be credited toward the purchase of stock required for membership. These associations had 495, 74, and 100 patrons respectively who had made partial payments on stock in this manner. On the other hand, no systematic provision was made for the retirement of stock of members who had ceased to patronize. The result

was that 20, 32, and 38 percent of their members respectively were no longer patrons.

Five associations had no systematic provisions either for making members of producers or for terminating the memberships of non-producers. This does not mean, however, that no effort was made by these associations to keep their membership rolls up to date. Most of them retired some of the stock of deceased members or of those who had moved away. One association was making a determined effort to repurchase all its nonproducer stock in order to clarify its position with reference to payment of Federal income tax. At the same time the fact that they had no announced policy either for the sale or repurchase of stock meant that any action concerning stock was haphazard at best. Two of the associations had made no changes in their stock lists for 4 years, in spite of the fact that there had been considerable turnover in patronage. The result of these membership policies was that the 5 creameries had 1,452 members, 35 percent of whom were not patrons, and 3,237 patrons, 69 percent of whom were not members.

### *Indiana*

In Indiana, where production per patron is lowest, six of the seven member units were sponsored by the Farm Bureau Federation as part of its general program for the State. In one instance the county bureau provided funds and management for starting the creamery and actually operated it for a period of years. Subsequently it was separately incorporated, and control vested directly in the patrons. In other instances the county farm bureaus, many of which had previously operated cream stations, formed groups to establish creameries, sometimes pledging only the business of their members but often going so far as to provide the original financing as well. Some of these early creameries were set up with the county farm bureau rather than the individual patron as the membership unit. This device served the purpose of concentrating the scattered interest of producers in the local units. Only one association still operates on this basis.

At the time of the survey, three of the Indiana creameries were organized with capital stock and four were nonstock. The actual range in the basis of membership, however, was much wider than this statement would indicate. One of the four nonstock associations made membership coincident with sale of butterfat. It issued no evidence of membership but allocated on its books all earnings withheld for capital purposes. In one all patrons were considered members, and all had the privilege of voting. Certificates of ownership were issued for patronage dividends declared and withheld. The third issued certificates of membership to patrons who had delivered as much as 1,000 pounds of butterfat; and the fourth used certificates of indebted-

ness as the basis of membership—thereby limiting membership while greatly extending its patronage. In the latter instance, the certificates were similar to common stock in the privileges they accorded their holders.

Of the three associations organized with capital stock, two made members of all patrons, crediting patronage dividends toward the purchase of at least one share of stock. One of these associations required the patron to sign a membership contract as a formal basis of stock subscription. The other stock association had as members five county farm bureau associations. In this case patrons exercised control over the creamery through their control of the local associations. The financial interest of the locals in the creamery was prorated, however, on the basis of patronage. Records were kept of shipments of each patron, and credit for all the deliveries of its members was allocated to each local association.

Thus, of the seven associations, four had the same number of members as patrons and did business entirely with members; two had limited membership and greatly extended patronage; and one, a non-stock association, had more members than patrons. The result of these policies is that at the time of the survey the seven Indiana creameries had 13,937 members, of whom over 96 percent were patrons, and 17,897 patrons, of whom 81 percent were members.

### *Tennessee*

The three associations in Tennessee are organized with capital stock. They are rather old, the most recent of the three having been organized in 1921. Until the last few years little attention was paid by any of them to the relation between patronage and membership, with the result that many of the stockholders were no longer patrons and few of the patrons were members. This being true the associations could not legally qualify as cooperatives and were, therefore, not eligible for membership in Mid-West Producers' Creameries, Inc. They were, however, admitted to associate membership so that they might receive the benefits of the services offered by Mid-West pending reorganization on a cooperative basis. All three were assisted in reorganization by officials of Mid-West, Tennessee dairy extension workers, or the Louisville Bank for Cooperatives.

The general procedure in these reorganizations has been to exchange the old stock for nonvoting preferred stock, and to issue new shares of common stock of low par value to those who had patronized the association during any period agreed upon prior to reorganization. The preferred stock is retired as earnings, or deferred patronage dividends of the new members accumulate. In some instances the reorganization has involved amendments to the articles<sup>1</sup> and bylaws

limiting dividends on stock, setting up provisions for voting, and otherwise meeting the requirements of pertinent cooperative statutes.

Since reorganization has not been completed, it is not possible to summarize the membership conditions of these three creameries. There appears to be a difference under the new set-ups in the interpretation of what constitutes membership. The practice of declaring patronage dividends at specified rates per pound of butterfat delivered, to be credited toward the purchase of stock, means that some patrons will receive credits amounting to less than the par value of the stock. Standard practice as to the extension of membership privileges to such patrons has not been established.

### *Illinois*

The one association in Illinois was organized in 1930 with two classes of stock: Common, which has no par value and is issued to all patrons and canceled upon cessation of patronage; and preferred, which was sold to provide original financing and was, therefore, sold to producers and businessmen alike. Under an Illinois statute both common and preferred stock carry the right to vote. In order to meet cooperative requirements, therefore, the association has had to take steps to get its preferred stock into the hands of patrons. The means for transferring such stock is provided by the declaration of patronage dividends which are credited to the stock accounts of patrons but are withheld for the repurchase of preferred stock held by nonproducers.

For member associations as a whole one fact stands out, namely, that the acquisition of membership has not been allowed to discourage producers from patronizing the creameries. With few exceptions, either membership is made automatic with patronage, or the restrictions on nonmember business have been so relaxed as not to stand in the way of additional patronage. The exceptions to be noted are: (1) The Indiana creamery which requires producers to sign a membership contract before they may receive patronage dividends (but not before they may patronize); and (2) the four Michigan creameries which make specific deductions for the purchase of stock from payments for butterfat. These latter deductions, however, are more a part of the financing plan than of the membership policy. The effect of the financing plans upon membership and patronage need now to be considered.

### METHODS OF FINANCING

A composite statement of the net assets and sources of financing for the 18 creameries having balance-sheet records at the time of the survey is shown in table 9.



TABLE 9.—NET ASSETS AND SOURCES OF FINANCING FOR 18 CREAMERIES, MARCH 31, 1937

Item	Total	Average for 18 creameries	Percentage of total net assets	Range
	Dollars	Dollars	Percent	Dollars
Net assets.....	1,520,512	84,478	100	13,035-308,961
Outside creditors:				
Current.....	80,787	2,821	3	0- 8,410
Long-term.....	119,006	6,611	8	0- 64,667
Member and patron capital:				
Deferred payments to patrons.....	277,166	15,398	18	0- 58,712
Allocated member capital.....	828,761	29,264	35	2,898-155,471
Surplus and capital reserves.....	546,792	30,377	36	0-157,801

For the group, net assets totaled over 1½ million dollars, 11 percent of which was financed by current and long-term creditors and 89 percent by members and patrons. In order to differentiate between producer and "outside" capital, deferred payments to producers are grouped in this classification with finances derived from members and patrons. It will be noted from the last column that the range in amounts from the different sources varies widely.

Financing provided by outside creditors was of two types: (1) Current, or that required for normal business operations, and (2) long-term loans, largely for expansion or replacement of facilities. The amount of current liabilities was influenced primarily by each creamery's volume of business and its policies in meeting current obligations. For the group as a whole the current creditors supplied but 3 percent of the financing, and there was little variation from this average for individual plants.

There was a much wider variation in the amount of financing supplied by long-term creditors. The older associations have practically eliminated this item, only 2 of the 12 associations in Michigan and Tennessee having any long-term loans. Of the \$119,000 provided on long-term credit, \$113,000 was owed by four of the younger Indiana associations which were still in the process of expanding operations and acquiring the necessary facilities. The methods used for replacing credit from outside sources with funds supplied by members and patrons will be discussed in a later section.

The capital provided by members and patrons was in three forms: (1) Deferred payments to producers for products delivered; (2) allocated member capital in the form of capital stock, certificates of membership, certificates of indebtedness, and book credits for patronage dividends withheld; and (3) unallocated member capital represented by surplus or capital reserves.

Financing through deferred payments to producers was dependent largely upon the length of time payment was deferred. Practices among members of Mid-West in this respect varied from cash settlement for each can of cream, to a monthly pool with a further defer-

ment of 15 days after the close of the pool period. For six associations which paid patrons at intervals of less than 1 week, deferred payments provided only 6 percent of required financing, while for 12 associations paying at weekly, or longer intervals, 24 percent of finances were provided by this source. One association was able to start operations virtually without operating capital by relying upon current creditors for supplies and deferring payments to producers for products delivered.

The difference between allocated and unallocated member capital is largely in the method used for acquiring capital from members and how these contributions are carried on the books of the association. Since the relationships between debt, allocated capital, and unallocated capital have worked themselves out over a period of years a review will be made of the financial histories of the member creameries, with special emphasis on the means used to enlist the financial support of the patrons.

#### *Means of Obtaining Capital from Members*

The need for member capital grows out of the necessity for payment of debts incurred in acquiring plant facilities and operating capital, or in providing funds to finance business expansion. Patrons may provide capital either directly through the cash purchase of stock or certificates or indirectly through authorizing retains from the proceeds of sales of products delivered. If the certificates which are issued for cash are to be retired through subsequent deductions, this type of financing also becomes indirect or revolving capital. Even when stock which is not to be retired during the life of the association is used for financing, the requirements of capital in excess of original contributions are often derived from earnings on products.

Whether the retention of earnings or deductions from sales will later appear in the balance sheet as allocations to the credit of patrons or as unallocated surplus depends upon the policy adopted by the individual association. Almost all possible variations are represented among the Mid-West creameries.

Eight associations obtained initial capital through the sale of stock. Two issued certificates for the original capital, and one of these has already retired all its certificates. Four sold stock but had to borrow additional funds. Two sold stock and took over physical facilities on contracts, while another gave preferred stock for facilities and borrowed operating capital. One floated a bond issue to obtain funds; another borrowed at a local bank using the notes of prospective patrons as collateral; and one used funds accumulated by co-operative cream stations for the purpose of starting a central churning plant.

It is apparent that in at least 18 of the 20 creamery associations the organizers assumed the major responsibility for providing capital by putting up cash or personal credit for loans. In the other two instances it was possible to obtain funds by pledging physical facilities without the producers' having to assume responsibility.

Without exception the associations have found that the funds necessary to operate under present conditions and with present volumes have exceeded the amounts required at the beginning. In one instance an association starting with \$2,500 now has net assets exceeding \$175,000, built up over a period of 21 years. While this is probably the extreme case, the others have had experiences differing only in extent. The methods used for obtaining the additional funds and giving recognition to contributors may be a major factor in the patronage problem.

In every case, the major source of capital for expansion after organization has been earnings on the products handled by the association. These earnings have been realized in a variety of ways, depending upon the methods used for distributing the proceeds of sales. There are two general methods used for such distribution (1) the net proceeds pool, and (2) cash advances at the time of delivery with patronage dividends paid at specified intervals.

Earnings through pools arise out of capital deductions of funds for specific purposes or through a net underpayment. In the second method, funds for specific uses must be held out of the total earnings before patronage dividends are declared. In general, the Michigan and Tennessee creameries use the pooling procedure, and the Indiana and Illinois creameries follow the system of making cash advances and paying patronage dividends. One creamery in Tennessee operates on the cash-advance basis, one in Indiana uses a pool, and another Indiana creamery pays weekly using a market formula to establish current prices.

Earnings have been supplemented by the outright sale of stock in a few instances. In addition to the outright sale of stock three Michigan creameries have made specific deductions from nonmembers, which have been applied on the purchase of a share of stock. In effect this method is essentially similar to the procedure followed by associations which retain the dividends of nonmember patrons until such retains equal the value of a share of stock.

The method by which the earnings are made determines to a great extent the manner in which they appear on the books of the association. The creameries making retains from pool prices generally enter their earnings as additions to surplus. Specific deductions from nonmembers for the purchase of stock have, of course, appeared as increases in stock outstanding.

Retains out of gross earnings before the payment of patronage dividends, on the other hand, are usually allocated to patrons. One association following this plan carried all retains to surplus; two allocated all retains to members on a patronage basis and showed no surpluses; one divided the increased capital between surplus and certificates of ownership issued on a patronage basis; and two divided the new capital between surplus and stock credits to all patrons.

One notable exception to these different methods of accumulating capital was found in the case of the Michigan creamery previously described, which paid for products on a pool basis, and made specific deductions of 1 cent per pound of butterfat for capital purposes from all patrons. In this way not only was recognition given to deductions for capital purposes in proportion to patronage, but by revolving the capital the association was also able to keep membership in accord with patronage.

### *Effect of Financial Methods on Patronage*

In general, the methods for obtaining capital have not discouraged patronage. Earnings have been limited to amounts which could be retained without reducing patronage. The relationship of retains to the intensity of competition is shown by the fact that associations operating under favorable conditions pay debts or expand facilities almost at will, while others, hard pressed by competitors, have found debt payment a slow and painful process.

Specific deductions from nonmembers to purchase stock are sometimes a deterrent to patronage. Associations have been able partially to offset this effect by using arguments of equity among all patrons, stating that the deductions are evidenced by stock and control privileges. On the other hand, one association gave up specific deductions in favor of retention of earnings.

In contrast, is the association using specific deductions for revolving capital stock. This association found that once a patron learns what it is all about, he not only submits willingly to the deduction but assumes a greater responsibility in his association.

Two factors of major importance—membership requirements and patron financing—have been discussed. For the most part, the member creameries of Mid-West Producers' Creameries, Inc., have handled these factors so as to minimize their negative effects on patronage. Whether this disposition will contribute in the long run to a sound cooperative structure has not been determined. At least, it has not stood in the way of extending patronage.

The positive factors must be considered in obtaining butterfat delivery by producers and its use by the Mid-West creameries. First is the ability of the association to increase returns to producers; that

is, to pay prices that will attract patrons. Second is a program to acquaint producers with the advantages of cooperative effort in general and, more to the point, of dealing with the particular cooperative involved. Third is procurement, which overlaps the other two factors by affecting costs, by influencing returns to producers, and by providing an effective means for contacting patrons. In addition, procurement may provide an increased return to producers through superior service.

### EDUCATIONAL PROGRAM

An educational program, based on the needs of the individual creamery, is carried on to explain to members the organization, operation, and accomplishments of the association. The program also includes methods of obtaining new members, holding those already affiliated, and inducing all cream shippers to deliver products of the highest possible quality so that the association will enjoy a preferred market. As the educational activities are limited to acquainting producers with the superior services available, it is impossible to judge their effectiveness quantitatively. We may study the methods, however, which are used by the various associations.

The necessity for educational effort on the part of the individual association varies with the producers' knowledge of and attitude toward cooperation and their interest in the returns on the product handled. State extension services and general farm organizations sponsor programs of education in cooperation and marketing which teach producers a better comprehension of their problems. It remains for the associations to point toward extension of patronage at their own plants, which is the object of the individual association's educational program. Only when the associations are actively sponsored by a general farm organization—as several of the Indiana creameries were by the Farm Bureau—can they expect the general educational work to assist them directly.

Competition between cooperatives in the same area intensifies the necessity for each association to carry on its own educational work. A general program encouraging producers to act cooperatively loses its effectiveness for individual associations when the producers' only other outlet is another cooperative. Thus, in Michigan, the trade areas of several cooperative creameries may overlap, and a generalized program of producer education may assist one no more than another. Each creamery must use the facilities at its disposal for enlisting the patronage support of the producers in its area.

The annual meeting is the one occasion during the year when all members are invited to gather, to elect directors, review the year's activities, and otherwise participate in the business of the association. The extent to which the annual meeting is used as a medium of contact

with producers, however, varies widely. Eight associations make the annual meeting a business meeting only and, either limit the attendance to members, or extend invitations to members only. In several of these associations not all patrons are members, so that even if all members attended all present patrons would not be reached, nor would the nonpatronizing producers of the area be reached.

Four associations, using opposite tactics, make the annual meeting the big "turn-out" of the year. Special inducements offered range from free lunches, attendance prizes, and entertainment, to the distribution of patronage dividend checks on the last year's business. In addition to the routine business of the annual meeting, speakers discuss cooperative organization and marketing, dairy production, and quality improvement, and other subjects of primary interest to dairymen. At these meetings an attendance of 3,500, including whole families of patrons and other producers, is not uncommon.

Between these two extremes are eight associations which use the annual meeting only casually to reach producers. These associations provide some educational features on the program but make no special effort to increase attendance other than through publication of legal notices.

Four associations which do not have large annual meetings hold summer "booster meetings" in the form of picnics, dairy days, fairs, or other occasions. The reasons advanced for having these gatherings are that unfavorable weather may retard attendance at the annual meeting; that this meeting is regarded as a "family affair" to be participated in by members only; and that the combination of business and educational activities in one program makes too long a day.

Two Indiana creameries hold district meetings prior to the annual meeting. These are primarily business meetings. They give members in the districts an opportunity to review the business, nominate directors, and elect delegates to the annual meeting. The total attendance at the district meetings, it is believed, exceeds the probable attendance at one central meeting and thus affords an opportunity to reach more producers with information concerning the association.

In addition to these business meetings, several associations hold special gatherings of producers for educational purposes. These meetings, held in district schoolhouses or other convenient community gathering points, are largely for the purpose of improving cream quality. In Tennessee, representatives from the Agricultural Extension Service, or from the United States Department of Agriculture assist with the programs. One Indiana association held a series of winter meetings to each of which a selected group of patrons was invited for inspection of plant operations and discussion of association affairs. The association management was assisted in these meetings by a representative of the State Agricultural Extension Service.

Managers of the creameries are considered to hold important business positions in their respective communities and are often given opportunities to speak before other than creamery groups. Several managers reported extensive activities along this line.

In addition to holding meetings of various types, the associations maintain contacts with producers through the distribution of literature. This literature deals mostly with quality improvement and may be provided by the State agricultural experiment stations, by the central office of Mid-West Producers Creameries, Inc., or by the local associations themselves. Most of the associations send letters to patrons, along with the cream checks, as occasion demands.

Large meetings and circular letters lack directness because of their impersonal nature. To overcome this difficulty seven associations employ field men. These men usually solicit patronage, but their main job is to sell and service separators and promote quality-improvement work among patrons.

Less formal and probably more effective field work is carried on by directors of the association. Directors are usually elected because they are producers of high standing in their communities. While the work they do in maintaining organization morale among producers cannot be measured, it is so highly regarded that arrangements are made to have directors elected from the several districts of the trade area. This is sometimes done by formal districting of members, but usually by common consent or custom developed over a period of years. The dispersion of directors establishes a two-way medium of influence between producers and the association management.

The educational devices which have been discussed here, with the possible exception of the work of directors and of the few field men, afford only irregular or spasmodic contacts with patrons. At least weekly and often semiweekly contracts are made with patrons by the truck drivers who gather the cream. This service provides an excellent opportunity for solicitation of patronage, quality work, and dissemination of information concerning the association. The Mid-West creameries rely heavily upon this service for their educational work.

The quality of the educational work done by the haulers varies widely, depending upon the care exercised by the management in their selection and training, and the degree of control the association maintains over their activities. There is a wide difference of opinion between managers as to whether more active solicitation of patronage is obtained through association control and directed driver activity or through the use of additional commissions to the haulers as incentive to contact new patrons. Control of the drivers is probably the most important reason for the shift from contract hauling to association ownership of trucks with the drivers on the association payroll.

Of the 20 member creameries, 15 owned one or more of their cream trucks at the time of the study. Five of the fifteen had adopted the policy of association ownership during 1935 or 1936, giving as a reason in addition to reduction of hauling cost, the increased effectiveness of controlled driver field work. With few exceptions, the associations owning only part of the needed trucks used privately owned trucks as occasion demanded.

Several associations have improved the quality of the field work done through drivers' meetings at which problems of quality improvement and creamery organization were discussed and patronage campaigns planned. Some associations give cash bonuses to drivers bringing in the most new patrons or the largest volume of butterfat in each week, while others pay commissions on the sale of separators and supplies as well as butterfat patronage.

#### PROCUREMENT METHODS USED BY MID-WEST CREAMERIES

The methods of procurement have two very important aspects. First is the part they may play in making contacts with producers and furthering the patronage interests of the individual creamery. Second is their effect upon the association's costs of operation, which, in turn, has a direct bearing upon returns to producers.

Methods of assembling butterfat at creameries may be grouped under four headings: (1) Producer delivery, (2) truck-route collection, (3) direct shipment by rail or common carrier trucks, and (4) cream station purchases.<sup>4</sup>

Among the 20 Mid-West creameries all 4 methods may be found, but the truck-route collection exceeds all others in importance by a very wide margin. In Michigan, the 9 Mid-West creameries received 95 percent or more of their total butterfat by truck route, 5 of them receiving all butterfat in this way. The other 4 Michigan plants had small quantities of cream delivered directly by producers, but none of them made use of direct shipments or cream-station purchases.

Two of the four Tennessee and Illinois associations each operated a cream station in addition to having some producer deliveries. The percentage of cream received by truck at these plants was 66 and 85 percent, respectively. Of the other two plants, one received all of its cream by truck; the other, about 75 percent on trucks and the rest by producer deliveries.

In Indiana, four of the seven associations used both stations and direct shipments. The proportion of total receipts assembled on trucks by these four plants ranged from 50 to 93 percent, the two associations having the lowest percentages each operating eight cream stations. The remaining three plants received from 85 to 100 percent

<sup>4</sup> See reference cited in footnote 3.



of their butterfat from truck routes, the balance being delivered by producers.

Thus, the percentage of butterfat received from truck routes by the members of the Mid-West association ranged from 50 to 100 percent with an average of 88.6 percent. At least two factors cause the wide range in these percentages. First, some associations have definitely discouraged producer deliveries by permitting no price differential on cream delivered directly to the plant by producers. Thirteen associations followed this method, and only two of them received less than 95 percent of their cream by truck. The lower percentages in these two cases are partially explained by the use of stations as well as producer deliveries. The average percentage for the 13 plants offering no price concession for producer-delivered cream was 95.3 percent by truck. In comparison, seven associations allowed price differentials ranging from 1 to 2 cents per pound, or quoted their prices f. o. b. the plant and allowed producers who delivered their own butterfat the actual route cost per pound. The average received by truck at these seven plants was 76.2 percent.

Second, six of the seven associations allowing a price differential for producer deliveries were located in Indiana where, as already noted, cream stations and direct shipments were prevalent. Either through tradition or necessity, these methods of procurement will continue. Their coexistence with truck routes and direct producer deliveries will tend to justify either an f. o. b. plant price or a stated differential for deliveries to the plant.

The elimination of the differential, however, has contributed to the high percentages of cream assembled by truck, which was the specific purpose in some of the Michigan creameries, particularly where the associations operate the trucks. The differential encouraged nearby producers to make their own deliveries, and this, in turn, disrupted the route organization for the rest of the trade area.

### *Direct Shipments*

Only three associations, all in southeastern Indiana, received direct shipments, and only one of them obtained a large volume of business by this method. At one plant direct shippers received the posted door price or f. o. b. plant quotation less the actual freight cost. The shipper paid the freight at another plant but received a premium of 2 cents per pound of butterfat over the route price, while at the third plant the association paid the freight and the shipper was paid the route price for the cream shipped in by rail. These three methods of handling direct shipping costs and prices placed the direct shippers on practically the same price basis as route patrons at the same plants.

### *Cream Stations*

As previously stated, five of the Mid-West associations operated one or more cream stations. One of them purchased butterfat through a station where it was not economical to operate a truck route because of light butterfat production. The other four associations using stations operated in regions where stations had predominated and the greater number of producers appeared to prefer them. The associations' truck routes operated in the same territories served by the stations, thus tending to restrict the efficiency of both methods.

A total of 19 stations bought cream for the 5 associations. Commissions paid the stations varied from one-half to 3½ cents per pound of butterfat. This wide variation resulted from the extent to which the association furnished equipment and supplies and the bargaining power of the station operators, which, in turn, depended to some extent upon their sponsorship. Thirteen stations were operated by local farm bureau associations. They owned their own equipment and received commissions ranging from one-half to 2 cents per pound butterfat. Two stations were owned entirely by independent operators who received 3 and 3½ cents per pound butterfat f. o. b. the creamery. One station was owned outright by the association and operated by an employee, but separate accounts were not kept, so the costs under this arrangement could not be ascertained. The other three stations were independently operated, but the association furnished part of the equipment and supplies and, in addition, paid from 2 to 3½ cents per pound butterfat f. o. b. the creamery, as commissions.

There were several different arrangements, too, in the manner of returning earnings to station patrons. In three cases the station volume was considered as nonmember business, and the operator was paid the current price plus his commission with no further attempt made to prorate earnings to the patrons. In eight instances the stations were considered as individual patrons on the books of the association and received one patronage dividend check. These stations, being local cooperatives, however, then rebated the dividend to their patrons on the basis of their own records of patronage. The other eight stations, either operated by local cooperatives or independents, furnished the creamery with daily patron transaction sheets from which the association set up records of patronage for direct payment of dividends.

While station operation, direct shipment, and producer deliveries may assume important proportions of total volume received at some of the plants, almost 90 percent of all butterfat received by the Mid-West creameries was assembled on truck routes. Of particular interest then, are the arrangements the creameries have made for handling the truck-route operations.

### *Truck-Route Operations*

One of the reasons why associations wished to control hauling, in addition to the advantage in reaching producers, was the possibility of reducing transportation costs. In order to understand the hauling-cost problem, it is necessary to analyze some of the factors affecting costs and the means used by the associations for handling the route operations.

#### *Development of Cream Routes*

In the older dairy sections, such as Michigan in the Mid-West territory, assembly of butterfat on regular routes was started in the days of the horse and wagon. Some of the older plants were designed especially to accommodate wagons rather than trucks. In some cases the teams and equipment were owned by the creamery. One Michigan association in 1915 had eight teamsters collecting cream. The main roads were rocked but not paved and all other roads were of dirt construction. The association kept an extra team in harness to send out on short notice to pull the regular teams out of mud holes. During the transition from those conditions to the present time was a period in which the early trucks were out of commission so often that relief trucks had to be kept in readiness. Throughout the whole period a major portion of the route equipment has been owned by the association.

Not all the Michigan creameries, however, own route equipment. Some of the associations own none of the routes, and others have only recently taken over a part or all of the trucks. Thus, of the nine Michigan creameries, three owned all their trucks, two relied entirely on privately owned trucks, and four owned only a portion of the equipment.

In Indiana, truck routes have developed at the expense of stations and direct shipments, as only in areas of more concentrated production were horse-and-wagon routes or even producer deliveries important. As previously indicated, the transition to routes here is not complete and, under the sparse production conditions which exist in some portions of the State, may never be complete. Only one of the seven Indiana creameries owns all its route trucks, two own none, and four have both owned trucks and commission haulers.

The situation in Illinois is quite similar to that in Indiana. The one association which operates there uses both stations and producer deliveries and owns only a portion of the trucks used.

In Tennessee production conditions in the area where the creameries operate more nearly resemble those in Michigan, and the creameries started operating on a producer-delivery basis. One association, however, established its own routes in 1925 and now gets its entire product

in that way. Another association owns no trucks and still receives an important part of the total by producer delivery; the third has both association-owned and commission trucks operating.

### COST OF PROCUREMENT

A tendency for the associations to absorb the cost of procurement is linked with the active participation of the creameries in the truck-route operations. That is, the costs of cream assembly are included in the general expenses of operation in computing the prices to farmers, so that the price paid is f. o. b. the farm. This fact is true in 18 of the 20 Mid-West member creameries. The hauling rate is thus a matter of direct concern to the association, being left to negotiations between producer and hauler in only two instances. Under this system hauling costs are reflected directly in the prices paid by associations to producers and the quotation of a high f. o. b. plant price, which may confuse patrons as to actual returns, is eliminated.

The exact cost of hauling may be determined only when the association owns and operates the trucks and keeps separate cost accounts on the operations. For several reasons cost accounts of this type were available in only a few of the Mid-West creameries. At some of the plants the drivers also worked in the plant or office and trucks were used for delivery, so that keeping assembly costs would have involved arbitrary allocation of time and costs to each task performed. At a number of plants truck cost accounts were not segregated from general-expense accounts. Four associations had owned the trucks for less than a year and, as costs vary seasonally with changing volume and hauling conditions, a part-year record is inadequate for comparative purposes.

The commissions paid to private haulers, while representing actual hauling costs per pound of butterfat to the producer or association, are not based necessarily upon the costs of operation. The commission may include either a profit or a loss to the hauler, depending upon his bargaining position. The operation of a part of the trucks by the association provides a yardstick for setting commissions at levels approaching actual costs, especially if the association is in position to take over independent routes if the private haulers do not accept its terms.

Thus, in studying the costs of assembling butterfat on routes at least three kinds of cost records prevail. These are: (1) records kept by the associations on the actual costs of route operations; (2) records of hauling rates paid by the associations or by patrons to private haulers; (3) records which are either not segregated from the general accounts or are for too short a period to be of value for comparisons. Some of the associations in the third group also employ commission haulers and the commissions paid serve as an indication of hauling cost.

A very wide range in costs was reported for the associations having records of trucking costs or rates. Costs on owned trucks ranged from 0.92 to over 3 cents per pound of butterfat.

Since several of the associations are in the process of acquiring ownership and control of the trucks, the final result of ownership upon costs per pound of butterfat has not been established. The results at four creameries using both owned and commission trucks were as follows:

Plant	Cost on owned trucks	Commission paid
	<i>Cents per pound of butterfat</i>	<i>Cents per pound of butterfat</i>
Creamery A.....	1.60	1.66
Creamery B.....	.92	1.73
Creamery C.....	1.28	1.86
Creamery D.....	1.34	1.50

At another association, however, the cost of operating the trucks owned exceeded commissions paid to private haulers. This condition resulted from the association taking over routes where the private haulers either had been unable to build up volume or had let the territory get away from them. Comparison of results in this case should be postponed until the association drivers have had an opportunity to build up capacity loads.

The advantage in association ownership apparent in the preceding four cases lies in the fact that the associations were working the close-in territory with their own trucks and leaving the more distant routes to the commission truckers. This procedure appears to be common when associations take over the hauling operations.

Since only a small number of the associations owned trucks and these operated under widely different conditions, no statistical analysis of factors affecting the costs was attempted. Five associations, however, were operating truck routes on which the annual average costs of procurement were 1.6, 1.35, 1.34, 1.28, and 0.92 cent per pound of butterfat. Production of butterfat per patron by these same associations varied from less than 700 to over 1,100 pounds per year. For those with costs of 1.6 cents per pound, or less, the volume of butterfat hauled annually per truck was high, varying from 114,397 to 174,804 pounds. That this latter factor is of fundamental importance in the reduction of hauling costs has also been shown in studies of other regions.<sup>5</sup>

One of the other means used by the associations to keep hauling costs at a minimum has been the reduction of the number of deliveries from semiweekly in the summer to weekly in the winter, thereby increasing the size of loads, and reducing the number of trucks and

<sup>5</sup> Robotka, Frank, and Laughlin, Gordon, C., COOPERATIVE ORGANIZATION OF IOWA FARMERS CREAMERIES, Farm Credit Administration Bull. 14, 92 pp. illus. See pp. 60-64.

drivers required. Some operators object to this practice on the ground that quality of cream is lost by weekly delivery even in the winter time.

Another method of cost reduction is through rearrangement of routes acquired from private truckers. Such rearrangement has enabled the associations to reduce the number of trucks required, save mileage, and give the remaining trucks economical loads.

A third method is through the use of a number of management devices to get the most out of men and equipment. One manager had developed a system of truck accounting in which each driver was credited with earnings at a stipulated rate for products hauled and charged with all expense items such as truck expenses, depreciation, and the drivers' salary. At the end of each 6 months the net results were determined, and the driver's salary was adjusted on the basis of his performance. Another device was to arrange routes so as to give the drivers at least one afternoon weekly to make necessary repairs on the trucks. Other associations operate their own garages or have their own repair man. Quantity discounts on purchases of gas, oil, tires, and even the trucks themselves were a fruitful source of savings.

The managers generally recognize that the expense of truck operation and the working of an area through a routeman is largely a matter of selection and training of the driver. A major problem in association operation of trucks is to find men who are at the same time careful of the trucks and good salesmen who will build up the routes.

#### *Rates Paid Commission Haulers*

Fifteen of the twenty Mid-West creameries use commission haulers in procuring all or part of their butterfat. Five of the associations rely entirely upon commission haulers. Commission rates paid ranged from 1 cent per pound butterfat to 3½ cents on individual trucks with the association averages ranging from 1.12 to 3.16 cents.

The rates paid commission haulers are compared in table 10 to the costs incurred on association-owned trucks. It is evident that only one association pays a lower commission than the average cost of the five associations owning their trucks; that the majority of associations pay rates from 1.26 to 2.25 cents per pound; and that among associations hiring trucks there appears to be little consistency in reactions to the two factors which might be expected to affect the rates.

Of these two variable factors, in the table, the pounds of butterfat per patron annually may be used as a measure of the conditions under which the associations operate, and the butterfat hauled per truck as a measure of the effectiveness of the association's efforts to overcome the limitations to efficiency imposed by production conditions. The lower the average deliveries per patron, the more stops the truck must make to pick up a load. As competition has forced a continual

increase in free service to patrons, most of the routes are operated on a farmyard or milk-house basis rather than roadside pick-up service so that each additional stop means extra sidetrips, turning, and delay. This condition places a physical limitation on the number of stops possible in a day and cannot be offset even by comparatively large truckloads. This fact is illustrated in the table by the associations in the "2.76 cents and over" bracket of hauling rates. These two associations operate several routes where the drivers leave the plant in the morning, pick up cream all that day and the next, and return with the load at the end of the second day.

TABLE 10.—COMPARISON OF HAULING RATES, BUTTERFAT HAULED PER TRUCK, AND DELIVERIES PER PATRON FOR ASSOCIATIONS USING COMMISSION HAULERS AND OWNING TRUCKS, 1937

Hauling rate (cents per pound of butterfat)	Associations reporting	Average annual butterfat—	
		Hauled per truck	Shipped per patron
<b>Hired trucks:</b>	<b>Number</b>	<b>Pounds</b>	<b>Pounds</b>
Less than 1.26.....	1	150,000	1,224
1.26 to 1.75.....	6	178,287	664
1.76 to 2.25.....	4	60,750	650
2.26 to 2.75.....	2	29,911	416
2.76 and over.....	2	77,477	257
<b>Owning trucks: 1.29<sup>1</sup>.....</b>	<b>5</b>	<b>147,500</b>	<b>284</b>

<sup>1</sup> Average for 5 associations, data on sixth not available.

<sup>2</sup> Average for 5 associations.

At the other extreme is the association whose patrons delivered over 1,200 pounds per year on the average with an average volume per truck of 150,000 pounds. This combination produced the lowest rates paid to any commission haulers and is bettered only by the actual cost rate of 0.92 cent of the association owning its trucks with average patron deliveries of just over 1,000 pounds and average volume per truck of 150,700 pounds.

In the intermediate brackets of commission rates, however, there appears to be little consistency in the reaction of hauling rates to the other factors. The combination of small loads and low deliveries per patron of the associations in the "2.26 to 2.75" bracket leads to the expected result of a rather high commission, but there are several associations in the "1.26 to 1.75" bracket which also have very low average deliveries per patron not offset by large loads.

Other factors affecting the commission rates also must be considered. In some instances, competition between private haulers for the business of the patrons is sufficient safeguard against high rates. The hauling for one association is entirely by private truckers who deliver milk and cream to two other plants in town as well as to the cooperative. Thus, the butterfat delivered to the creamery is not an accurate

measure of the truckers' loads or their ability to haul at low rates. Competition between them, however, keeps the rate so low that the association's management is doubtful that it could lower costs through association ownership.

The costs incurred on association-owned trucks may be used as a standard by which to measure the combination rates. Associations not owning any trucks do not have such a standard, and their position in bargaining with private haulers may be weakened thereby. Two Indiana associations owning no trucks paid commissions which averaged 2.86 and 2.5 cents while the other Indiana associations' commission rates averaged 2.08 cents. Two Michigan associations owning no trucks had rates averaging 1.75 cents while four other creameries' commission rates averaged 1.55 cents.

The wide range in commissions paid, even when varying operating conditions are considered, seems to indicate that the hauling rates for some associations could be reduced. Especially when compared with the excellent results obtained elsewhere under association ownership do the commission rates charged by several of the associations seem high. More definite information could be brought to bear on the situation if the associations would give to truck operations and truck records the same emphasis they give to other operating details.

That the procurement problem is of sufficient importance to warrant detailed attention is shown by the proportion contributed to the total operating costs of the various associations. For 10 associations which segregated their costs, the procurement expenses ranged from 14.2 to 51.7 percent, and averaged 32.4 percent of the total operating expenses. In some instances, the procurement costs equalled and in one case was almost double the plant or manufacturing expenses.

Procurement, however, is but one phase of the associations' total operations and is but one factor affecting the net returns which the associations can make to producers. Since the price paid producers is the measure of an association's effectiveness in increasing returns, it is important to note the factors other than procurement which affect the price paid. The methods of making returns have important implications in a cooperative association quite aside from the level of payments. These subjects will be discussed in the following section.

## GENERAL OPERATIONS AFFECTING PRICES PAID FOR BUTTERFAT

**T**HE PRICE paid for butterfat is the direct measure of the association's effectiveness in increasing returns to producers and undoubtedly affects the patronage problem more than any other factor. Without a background of concrete results in raising prices, much of the effort expended in field work, solicitation, and "education"



is lost. On the other hand, one manager has said, "A patronage refund of 5 cents per pound butterfat is all the education our producers need."

In areas where producers have small volumes of butterfat on which to realize increased returns, the advantage of the association's price must be supplemented by active solicitation and educational work to bring it to producers' attention.

The price that can be paid is derived from the gross proceeds of sales less operating expenses. Proceeds of sales may be affected by quality, depending both upon processing at the plant and condition of the raw material; by sales efficiency, that is, getting the most out of the product through available market channels; and by use of byproducts to enhance total returns per unit of product received. Operating expenses depend largely upon efficiency of operations, of which procurement is a part. Other factors are the percentage of "overrun" obtained in the manufacturing process, the costs of manufacturing, selling, and overhead or administration. Some of the more important features of each of these will be discussed.

#### FACTORS AFFECTING SALES RETURNS

##### *Quality*

Improvement and standardization of butter quality by member creameries has been a primary purpose of the service work of Mid-West Producers' Creameries, Inc., from the time of its organization. At first it was the principal work of the association. Recently a laboratory service which measures and records butter quality has been established. This service has been in effect for too short a period to relate quality directly to sales returns. It is obvious, however, that the efforts of the Mid-West have brought about marked improvement in the quality of butter manufactured and, in addition, greater uniformity of product.

The extent to which actual selling prices are influenced by quality cannot be measured exactly because other factors enter to make a given creamery's output of butter more or less desirable to buyers. Quite as important as quality are the type of package and the location of the creamery as related to its basing point and its market.

##### *Package*

Variations in prices due to differences in packaging—whether in tubs or printed and, if printed, whether in  $\frac{1}{4}$ -pound or larger prints—can best be judged when considered for different parts of the same creamery's output. Thus, one association received one-half cent over the market quotation for butter in tubs and  $1\frac{1}{2}$  cents for cartoned

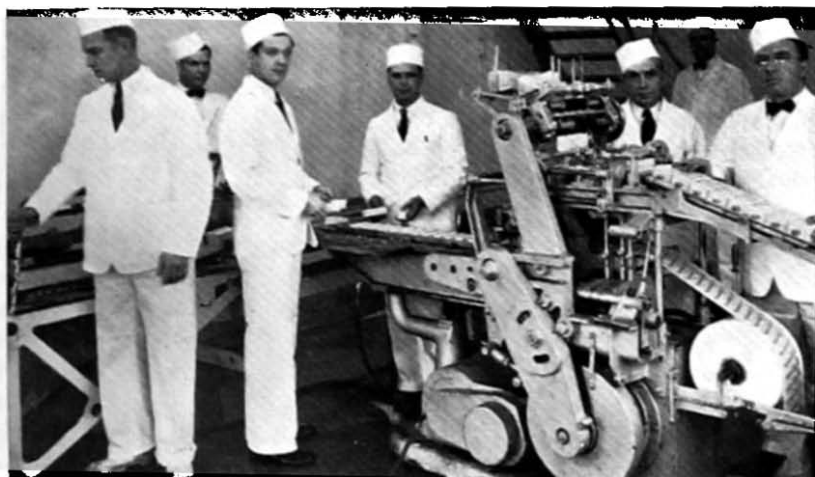


FIGURE 6.—BUTTER-PRINT ROOM SHOWING MACHINERY FOR CUTTING, WRAPPING, AND PACKING BUTTER IN THE CONSTANTINE COOPERATIVE CREAMERY.

Cooperative creameries have found it profitable to merchandise butter in nearby markets. Nearly all butter sold locally is packed in 1-pound cartons.

$\frac{1}{2}$ -pound prints. Another received one-fourth cent under for 1- and 2-pound prints and one-half cent over for "quarters." The premiums necessarily bear a close relation to the average differences in costs of printing the various packages (fig. 6). Yet there are wide differences in these costs depending upon the machinery and equipment available and labor costs at individual creameries. Some have found it advantageous to sell in prints, while others continue to make the bulk of their sales in tubs.

#### *Location Advantage*

Returns to creameries on an f. o. b. plant basis are subject to premiums or deductions for transportation. If the creamery is located in an area in which local production is not sufficient to meet the demand, as in Tennessee during some seasons, it has a price advantage equal to the difference between the cost of transportation to market and the cost of transportation from the nearest outside source of supply. On the other hand, the creamery that must sell most of its butter in distant markets must accept the price at those markets less the cost of transportation.

#### *Volume of Standard Product*

Buyers frequently are willing to offer a premium for a large volume of butter having a standard quality. The butter of a single large plant is more apt to be uniform than the same quantity coming from

a number of small plants. The standardization work of the Mid-West has been able to some extent to offset this advantage formerly enjoyed only by the larger creameries. Thus, two Michigan creameries have been able to get their butter quality on a similar basis and by so doing to make up truck loads together for shipment to one buyer. Without this uniformity the creameries would have the double disadvantage of shipping in small lots at higher cost and of accepting less desirable outlets at lower prices. Another small creamery sells its whole output to a larger Mid-West creamery, which, in turn, prints the butter for sale along with its own product and thus makes its price advantage available to the smaller plant.

Arrangements of this sort have been worked out wherever possible in lieu of establishing a concentration plant for grading, packaging, and selling the products of all the creameries. The predominance of associations in Mid-West which are large enough of themselves to have efficient printing operations and sufficient volume to attract buyers has thus far made unnecessary any physical concentration of butter by the overhead agency.

### *Local and Special Market Outlets*

By taking advantage of opportunities in their local markets, creameries are enabled to have larger sales returns than would be possible were butter shipped to distant markets. Since few creameries were located in large cities local sales seldom took a substantial part of their total supply. However, the three Tennessee creameries sold their entire production in southern cities at premiums because of their location advantage. For two of them this involved storage of surplus during the flush season for merchandising during fall and winter months. Other creameries sold up to 20 percent of their butter in their own or surrounding towns, generally direct to retail stores at the jobbers' price.

Sales of butter back to patrons were also a source of extra income to creameries. Ten associations exchanged a pound of butter for a pound of butterfat. This is a traditional arrangement, found very generally in creamery territory, which works to the advantage of the patron during periods of low prices and of the creamery during periods of higher prices. (See p. 49.) The advantage to the creamery during 1935, a period of high prices, is illustrated on page 11. In that year, the average selling price of butter was 27.92 cents per pound, and the net proceeds per pound of butterfat averaged 30.35 cents, which meant a saving of 2.43 cents for the associations. Other associations, which do not exchange butter for patrons' butterfat, either set their prices on a market-quotation basis or on a sliding scale of differentials from the butterfat price, with the differentials determined by the

value of overrun. Sales to patrons run as high as 10 percent of total sales in some of the associations.

One association in Michigan had developed a direct-to-consumer trade through the use of parcel-post shipments. Over a long period of years the trade grew entirely on a "satisfied customer" basis, no advertising or other sales effort ever having been made to extend it. The parcel-post sales were at a substantial premium over the Chicago 92-score quotation.

### *Byproduct Sales*

Thirteen Mid-West member creameries are strictly buttermaking establishments that receive all butterfat in the form of farm-separated cream. Four associations purchase limited quantities of whole milk for ice cream, cultured milk, or small fluid-milk sales; and three other associations accept whole milk without limit for manufacturing purposes.

The one common byproduct of churning operations at all plants is buttermilk. It may be sold as it comes from the churn in fluid form or may be processed to make buttermilk powder or a semisolid product with a high lactic-acid content. In any of its forms it is used almost exclusively as livestock or poultry feed.

During 1936, 10 Mid-West creameries sold buttermilk in fluid form to patrons or local livestock feeders at rates varying from one-half to 2 cents per gallon f. o. b. the plant. Only one association made any large quantity of the semisolid product. Nine made buttermilk powder. The installation of drying equipment at five of these plants has been recent, four of the machines being installed during 1936 and one during 1937. One association had drying equipment but was not using it.

As indicated in a previous section, there have been rather wide fluctuations in powder prices over a period of years. In 1935 and 1936, years of comparatively high prices in spite of the decline toward the end of 1936, associations that made powder had a very good additional source of income, the margin of returns over the cost of drying exceeding the value of the buttermilk in fluid form. For 1936 average net prices received by six plants that sold powder throughout the year ranged from \$6.97 per hundredweight to \$7.70 per hundredweight. One of these associations had its own feed outlets and therefore received a higher price than those selling through wholesale channels. With this one exception, powder prices received tended to be lower in Michigan and higher in southern Indiana. This is probably to be explained by the fact that production does not equal the local demands in southern Indiana, while a large part of the Michigan production has to seek outlets in distant markets.

Three associations that received whole milk for manufacturing purposes had skim milk as a byproduct of butter manufacture. In all three cases it was sold as powdered skim milk at prices essentially the same and subject to the same conditions as powdered buttermilk.

Receipt of raw material in the form of whole milk gave these three associations an alternative to butter as an outlet for the butterfat itself. All three sold substantial quantities of sweet cream at high premiums to ice-cream manufacturers. In addition, one plant made large quantities of evaporated milk and some cheese.

Four associations expanded their operations to include other dairy products besides milk powder. These included ice cream, cultured milk, or fluid milk for which whole milk was purchased from selected patrons in quantities as nearly equal to the demand as could be arranged.

### *Side-line Operations*

Without exception the creameries handled farm dairy supplies for sale to their patrons. It has already been indicated that several carloads of separators were sold during 1936 by the Mid-West members. Strainers and filter pads, stirring rods, cleaning powder, cans, and pails were also generally handled. In addition, three creameries operated feed, seed, and fertilizer departments. None of these, however, were located in Indiana, as separately incorporated farm-bureau service companies handled such side lines in most of its creamery areas.

One association handled poultry and eggs primarily to establish competition for independent buyers in the local market. Another association had developed a large egg business in connection with its butter sales in a nearby large city.

Almost without exception side-line purchasing activities are handled on a nonprofit basis. It is not generally intended that they should be more than services to producers and builders of goodwill for the creamery. On the important item of separators, for instance, the small margin over cost retained by most associations will probably not more than meet the costs of servicing expected of associations as the machines wear out.

The sales of byproducts and butterfat in products other than butter, on the other hand, are undertaken specifically to increase the earnings per unit of product received. In gross proceeds per pound of butter manufactured, the two associations that received whole milk and sold cream and other byproducts show a material advantage over the others (see p. 11). Although costs at these plants also tend to be high the advantage of higher sales returns carries through to the net proceeds per pound butterfat, giving the two associations the advantage in that regard.

This leads to the second phase of an association's general operations affecting prices; namely, its efficiency and its cost of operating.

## OPERATING EFFICIENCY

*Overrun*

Overrun is the weight of other ingredients added to each pound of butterfat by manufacture into butter. The legal standards for butter set by Federal and most State food and drug departments require 80 percent of butterfat, the other 20 percent of the butter being made up of moisture, salt, and curd or dairy solids not fat. Since there may be some error in the churning process, most creameries allow a slight margin of safety on the butterfat content. The standard established by the Mid-West laboratory is 80.5 percent (fig. 1), which makes the overrun in each pound of butter 19.5 percent of the butter, or, expressed in the more usual way as a percentage of the butterfat inputs per 100 pounds of butter, 24.2 percent. The theoretical maximum overrun for legal butter containing just 80 percent butterfat would be 25 percent. Low overrun means less butter to sell and lower returns to producers of butterfat.

The "book overrun," or difference between the amount of butterfat to be paid for and the amount of butter sold, is usually calculated rather than the overrun based on physical composition of the butter. This calculation of "book overrun" is subject to variations at each end; that is, the amount of butterfat received is the product of weights and butterfat tests at the receiving room, and the amount of butter sold is subject to plant losses of butterfat and other variations before the butter is actually listed as sold.

The value of overrun depends upon the level of butter prices. Given a standard overrun of 24 percent, its value per pound of butterfat received would be 2.4 cents when butter sells at 10 cents, 4.8 cents at 20 cents, 7.2 cents at 30 cents, and so on.

When related to total costs of operation per pound of butterfat received, the value of overrun becomes the explanation of a creamery's ability to pay more or less per pound of butterfat than it receives for butter sold. That is, if a creamery's costs are 6 cents per pound of butterfat and overrun is 24 percent, the creamery would be able to pay 1.2 cents less for butterfat when the butter price is 20 cents per pound and 1.2 cents more for butterfat with butter at 30 cents. The effect of variations in overrun upon efficiency is apparent when it is noted that if the percentage of overrun were 20 instead of 24, its value at 30-cent butter would be 6 cents instead of 7.2 cents.

The Mid-West creameries—through laboratory control of butter composition, field work with plant operations, and independent action at each plant—attempt to get the maximum overrun. For the most part, the overrun varies within a narrow range from 23 to 25 percent. Certain exceptions may exist, however. Creameries with very large volumes of butterfat obtained from a large number of

small producers may, within the tolerances allowed by law in reading the Babcock test and reading weights of cream to the nearest full pound, obtain overruns up to 26 percent.

### *Costs of Operation*

After a sales return has been established and the overrun standardized at approximately 24 percent, further variations in returns to producers may arise from differences in the costs of operation. For the group of creameries participating in the Mid-West cost analysis during 1935, the costs of operation per pound of butterfat procured are shown on page 11. These costs appear high because they include transportation of butterfat from the farm to the creamery, and because the remaining costs are stated in terms of units of butterfat rather than butter. If the operating costs in figure 1 were so expressed they would range from 4.23 to 8.7 cents per pound of butterfat instead of from 2.53 to 4.93 cents per pound of butter.

Variations in costs of operations are induced by several factors among which volume of business, diversification of operations including whole-milk receipts and disposal, convenience of plants, and wage rates are probably the most important. Costs of supplies used are fairly uniform except for differences in costs incurred for transportation.

The independent effects of volume of business, diversification of plant operations, and efficient arrangement of plant cannot be established for this group of creameries. In general, those plants handling only farm-separated cream and making only butter had the lowest plant costs. There is a tendency for costs to decline as volume expands, but one of these which had a modern, well-planned creamery had costs as low as one which had almost three times its volume but which had been rendered very inconvenient by frequent additions.

Few of the plants, especially the larger ones, were originally constructed to handle the present volumes. In most cases, convenience has been sacrificed for additional capacity, and the two forces—one toward higher costs, the other toward lower costs—have partially offset each other.

Originally, all plants were strictly butter factories. As additional facilities for handling whole milk or byproducts were installed, costs increased; and the only offsetting force was the higher returns from sales.

Wage rates paid by creameries are subject principally to two types of variation. First they tend to move their general level with all wages as reflected by the state-of-business conditions in the country; and this, if evenly distributed, will not cause variations in wage costs among creameries. It should be pointed out, however, that wages in all industries do not normally move together, even though there may

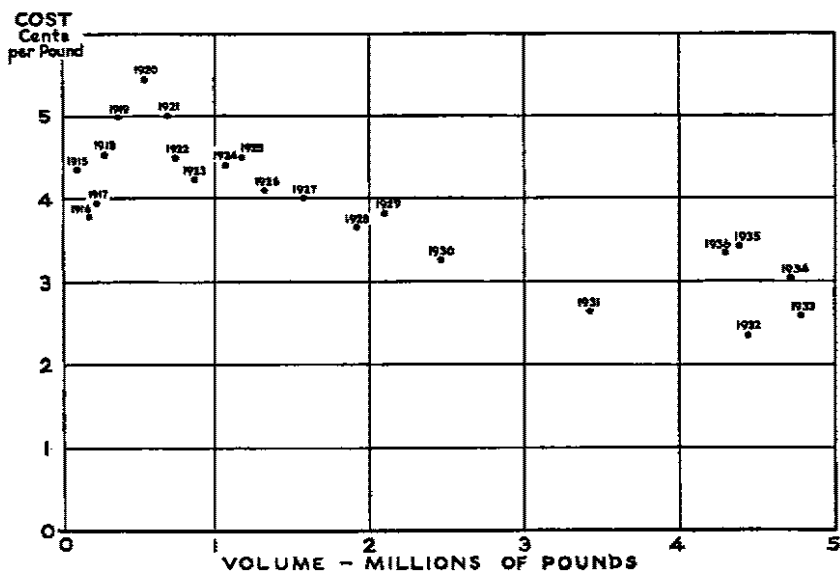


FIGURE 7.—OPERATING COSTS OF THE CONSTANTINE COOPERATIVE CREAMERY 1915-36.

The costs have been affected by changes in volume, prices associated with general business conditions, and increased efficiency of transportation facilities.

be a general tendency for them to do so. For example, the labor costs of a creamery with a higher-than-average wage will be affected more by a uniform percentage increase in wages than a creamery with wages below the average. Secondly, they also vary in different parts of the area covered by the Mid-West Association at the same time, and this gives creameries in the low-wage areas a decided advantage in costs over those in higher-wage areas.

The effects of several of these forces upon the operating costs of a particular association over a period of 22 years are shown in figure 7.

The association started operations in 1915 and in that year made 96,520 pounds of butter. In each year thereafter until 1933 the creamery increased its volume. The droughts and changed production conditions in 1934-36 reduced somewhat the total volume. Disregarding the costs of 1915, which were for only part of a year, the costs rose consistently from 1916 to 1920, reflecting the general level of prices and wages for the World War and immediate post-War periods. Then costs fell rapidly with the price level until the increase of 1924 and 1925. The rate of volume increases accelerated after 1925, and only the exceptionally high prices of 1929 interrupted the downward trend of costs. The low prices of the depression period coupled with tremendous increases in volume made for further decreases in costs. Improvements in transportation facilities were rapid in the period



after 1925 and as a consequence the costs of procurement were cut in half from 1925 to 1933. In 1933, however, the wages bill at this plant was increased \$50 per day. Lower volume in 1934 and 1935 worked together with the rising prices of wages and supplies of the recovery period to increase the costs again. Further increase in plant costs during 1936 was offset by material reductions in hauling costs to make the total slightly less than in 1935 even though volume again declined somewhat. While the Constantine Association has enjoyed unusual success, its record of expansion and reduced costs is characteristic of the larger group of creameries within Mid-West. Even for the smaller creameries the costs have been subject to the same influence, and the results are comparable although on a smaller scale.

### PRICES PAID FOR BUTTERFAT

The annual average prices paid for butterfat by Mid-West creameries during 1936 varied from slightly less than 31 to more than 36 cents. These prices are the end product of all factors that affect sales returns, operating efficiency, financial status of the organization, and production conditions under which the creameries operate. The lowest price was paid by an association having small volume, low quality of cream, butter as its only outlet for butterfat received, no byproducts or side lines of importance, a heavy debt on which payments had to be made, and high seasonality of deliveries. On the other hand the highest prices were paid by two creameries having volumes of over 750,000 pounds, low investments in plants per unit of product handled, no indebtedness, receipts of whole milk that enabled them to sell cream and milk powder at very profitable prices and provided high quality raw material for butter manufacture, and only moderate seasonal fluctuations in butterfat deliveries.

The influence of differences in seasonality of butterfat deliveries upon the annual average prices paid by associations is often overlooked. High seasonality of deliveries weights the annual average price with the low price of the flush season, while moderate seasonal fluctuations tend to give less emphasis to flush season low prices in the annual average. It is apt to be of more than ordinary importance among a group of creameries, such as those in the Mid-West organization, which extend over a large area and embrace a variety of production conditions. In the northern part of the territory winter dairying is generally practiced, and seasonal fluctuations in production tend to be moderate, although a "pasture flush" causes a sharp peak in the early summer. In the southern part producers are generally characterized as "grass milkers" having their cows freshen in the spring, milk during the summer grass season, and dry up in the winter. This makes for very low deliveries in the fall and winter, and high deliveries in the spring and summer.

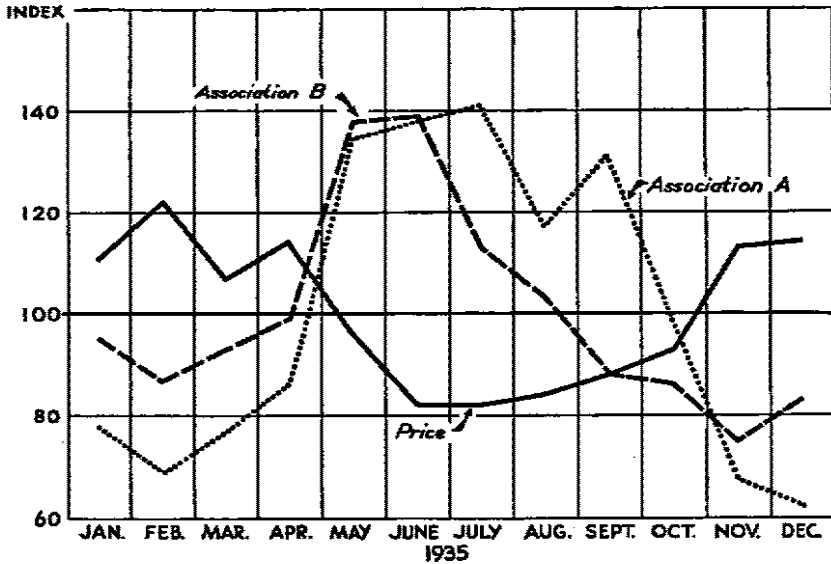


FIGURE 8.—WIDE SEASONAL VARIATION IN PRODUCTION OF TWO MID-WEST CREAMERIES.

Association A is located in southern Indiana, Association B in Michigan. There is greater variation from high to low in the southern than in the northern territory.

These facts are illustrated in figure 8, which shows the indexes of actual deliveries at two Mid-West plants during 1935 and the index of butter prices for the same year. Association A is in southern Indiana, Association B in Michigan. Butter prices tended to be high when the deliveries at both plants were low, but the deliveries at B did not fall so far below the average as those at A. Forty-five percent of deliveries at A were received during the 7 high-price months, October through April, and 52 percent at B during the same period.

Had the prices paid for butterfat borne the same relation to the butter price at both plants for each month of 1935, the annual average at A would have been 27.50 cents per pound, while at B it would have been 28.13 cents. The difference, amounting to 0.63 cent per pound, is attributable entirely to differences in seasonality of deliveries.

A further consideration in this regard is that a constant volume of product can usually be handled at a lower average cost than can the same volume distributed so as to require facilities to carry a high peak load for a while and then stand partly idle during the balance of the year.

#### CREAMERY OPERATING MARGINS

The market price of butter may be related to the price creameries pay for the butterfat in each pound of butter in order to obtain the gross operating margin independent of variations in the value of overrun. The margin so computed for individual creameries or aver-

ages for groups of creameries may be compared to determine their relative efficiencies in returning to producers the proceeds of sales.

From several Mid-West creameries two were selected, one in Indiana and one in Michigan, for comparison of their margins with the average margins taken by all creameries or buyers of butterfat in their respec-

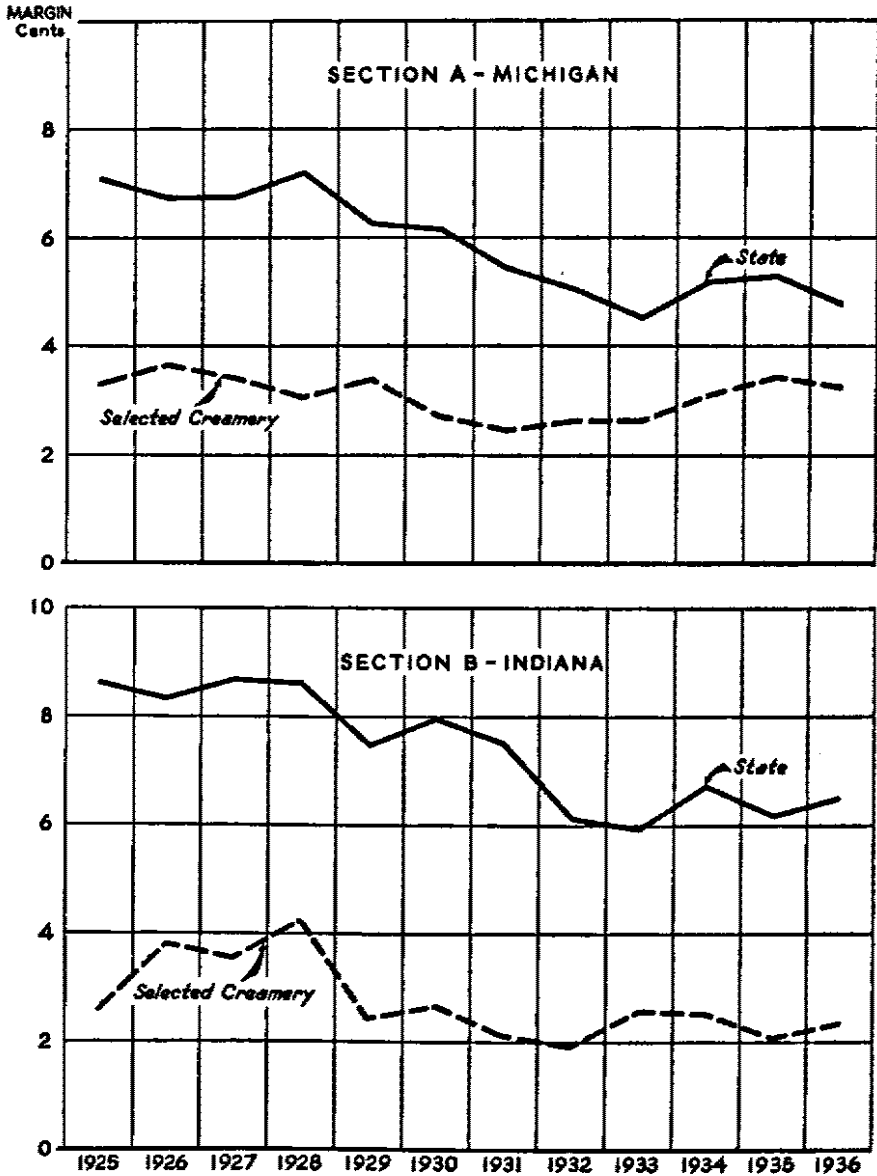


FIGURE 9.—COMPARISON OF STATE AND SELECTED MID-WEST CREAMERY MARGINS IN INDIANA AND MICHIGAN.

The margin for the selected Mid-West creamery is lower in each case than the State average.

tive States. These two creameries had records of prices paid in each pay period since 1925.

The margins between prices paid by the selected creameries, the State averages of butterfat prices, and the Chicago quotation on 90-score "centralized carlot" butter by years from 1925 to 1936 are shown in table 11. In figure 9 the average margin in each of the two States is compared with the margin retained by the selected Mid-West creamery operating in that State. It will be noted that the margin for the selected creamery is lower in each case than the State average. In other words, these figures indicate that these particular Mid-West creameries were returning to producers a higher proportion of the market value of butterfat than were the average butterfat buyers of their State.

TABLE 11.—CHICAGO BUTTER PRICES, BUTTERFAT PRICES CORRECTED FOR OVERRUN AND CREAMERY MARGINS, MICHIGAN AND INDIANA, 1925-36

(Cents per pound)

Year	Chicago butter price <sup>1</sup>	Michigan				Indiana			
		Farm price of butterfat		Creamery margin		Farm price of butterfat		Creamery margin	
		State average <sup>2</sup>	Selected creamery <sup>3</sup>	State average	Selected creamery	State average <sup>2</sup>	Selected creamery <sup>3</sup>	State average	Selected creamery
1925.....	42.15	35.06	38.85	7.09	3.30	33.53	39.57	6.02	2.58
1926.....	41.66	34.93	38.01	6.73	3.65	33.33	37.85	8.33	3.81
1927.....	44.28	37.54	40.89	6.74	3.39	35.60	40.73	8.68	3.55
1928.....	45.22	38.01	42.10	7.21	3.05	36.60	40.98	8.62	4.24
1929.....	43.20	36.94	39.82	6.26	3.38	35.74	40.76	7.46	2.44
1930.....	34.79	28.04	32.08	6.15	2.71	26.83	32.12	7.96	2.67
1931.....	26.50	21.08	24.05	5.42	2.45	19.00	24.38	7.50	2.12
1932.....	19.90	14.85	17.26	5.05	2.64	13.78	17.08	6.12	1.92
1933.....	20.31	15.79	17.67	4.52	2.64	14.38	17.73	5.93	2.58
1934.....	24.40	19.20	21.28	5.20	3.12	17.67	21.68	6.73	2.52
1935.....	28.65	23.35	25.22	5.30	3.43	22.48	26.57	6.17	2.08
1936.....	31.60	26.83	28.35	4.77	3.25	25.10	29.25	6.50	2.35

<sup>1</sup> Chicago market quotation for 90-score "centralized carlot" butter as reported by the U. S. Department of Agriculture.

<sup>2</sup> Annual average prices paid farmers for butterfat as reported in Crops and Markets, U. S. Department of Agriculture, corrected for overrun at the rate of 24.5 percent. The resulting figure is the price paid for 0.8032 pound of butterfat, or the amount of butterfat in 1 pound of butter having 24.5-percent overrun.

<sup>3</sup> Actual prices paid by the selected creamery corrected in the same manner as the State average prices.

<sup>4</sup> Current prices plus patronage dividend, corrected for overrun in the same manner as above.

The State average of margins in both cases has tended to decline during the period under consideration. Assuming that quotations are now made on the same basis, the decrease in margins must have been caused either by (1) a general increase in efficiency of the dairy industry, (2) a reduction in costs because of lower price levels of cost factors, (3) an increase in the general level of quality of products, or by (4) increased competition that forces buyers to forego profits in order to reduce margins.

There can be little doubt that the efficiency of the dairy industry generally increased. Machinery, plants, and transportation facilities have been improved, and costs of procurement have been reduced.

Technical knowledge of creamery operations has been increased and more widely disseminated. This is particularly true of the Mid-West creameries because of the intensive efforts of the overhead agency.

The effect of the price levels of cost factors is apparent to a limited extent in the comparative stability of margins from 1926 to 1928, their decline to 1932 and 1933, and some tendencies for increases from 1933 to 1936. These effects, however, are not consistent, especially in the case of individual creameries. This would seem to indicate that other factors were predominating in these particular instances.

An increase in the general level of quality within a State would have the effect of reducing the margin when that margin is computed on the basis of a fixed grade quotation. While no quantitative measure of quality improvement is available, it is generally conceded that there has been an improvement in the last decade. Yet the most intensive drive for quality improvement in butterfat has occurred since 1934 and during that period the margins have not declined. Any improvements in quality tending to reduce the margins may have been offset by opposing tendencies of other factors.

Increased competition may force a general reduction in margins either through reducing profits, or eliminating inefficient operators who can exist only on high margins. Such competition has been provided by cooperative creameries, especially because of their pressure toward more efficiency and the nonprofit nature of their operations. The percentage of the butter made by cooperatives in each of the States has tended to increase. (See table 12.) As the volume manufactured by cooperatives increases, it has the double effect of weighting the State average with more of the higher prices and extending the influence of the higher prices to other buyers of butterfat.<sup>6</sup>

TABLE 12.—PERCENTAGE OF TOTAL CREAMERY BUTTER PRODUCTION BY COOPERATIVE CREAMERIES, INDIANA AND MICHIGAN, 1925, 1927-35<sup>1</sup>

Year	Indiana	Michigan	Year	Indiana	Michigan
	<i>Percent</i>	<i>Percent</i>		<i>Percent</i>	<i>Percent</i>
1926.....	5.2	28.5	1931.....	13.3	30.2
1927 <sup>2</sup> .....			1932.....	15.0	37.9
1928.....	7.7	31.6	1933.....	19.6	44.3
1929.....	10.1	34.6	1934.....	17.7	41.4
1930.....	11.8	34.5	1935.....	18.8	40.8

<sup>1</sup> Estimates compiled by the Farm Credit Administration, Cooperative Division, History and Statistics Subsection.

<sup>2</sup> Data not available.

An important factor in an analysis of the operations of cooperative creameries is the method used in the distribution of proceeds of sales. The method used has significant effects upon the cooperative character of the organization.

<sup>6</sup> For an analysis of the effects of cooperative competition upon prices paid in other States see reference cited in footnote 3, and reference cited in footnote 5.

## PRICE SYSTEMS USED BY MID-WEST CREAMERIES

Mid-West creameries generally use two price systems. They are (1) the "pool" in which the association pays "as much as it can" in each pay period, and (2) the "patronage dividend" in which "advances" approximating the competitive price are paid at the time of delivery and patronage dividends at the end of the fiscal period.

The pool in which the butterfat is received, made into butter, sold, and the returns less costs prorated to producers on the basis of deliveries, is a clear-cut operation which currently returns to producers the net value of their products. It evolved out of a local creamery procedure in which payments to producers were deferred for periods varying from a week to a month. It was also the "cooperative" method of operation introduced into the dairy sections of this country by Scandinavian and German immigrants prior to 1900. The patronage dividend method, on the other hand, grew out of the cooperative procedures in centralized territories where settlements between butterfat producers and buyers were traditionally made on a cash basis. Under it the current competitive price or a price based upon a market formula is paid at the time of delivery or in current pay periods, and the earnings above these are prorated at the end of the fiscal period on a patronage basis.

While there are infinite variations in the two systems, it may be said that the first, or pool, is used by all creameries in Michigan, two in Indiana, and two in Tennessee. Patronage dividends are used by one Tennessee, one Illinois, and five Indiana creameries. Both systems are definitely products of their environments.

The advantages and disadvantages of the two methods of distributing proceeds may be classified under the following headings: (1) Educational problem in explaining the cooperative procedure to producers, (2) effect upon butterfat price levels in the creamery's area, (3) effect upon building membership and patronage for the cooperative, and (4) effect upon patron's contribution of financial support.

From the point of view of explaining the cooperative procedure to producers, there appears to be little choice between the two methods. Producers readily understand the essential procedure of the pool. However, it is possible to explain the patronage dividend system rather effectively by saying at the time of the first payment, "Here is the market price for your butterfat, it is all you would receive if you were not a cooperative patron," and later when paying the patronage dividend, "This is one measure of the benefits you derive from patronizing the cooperative creamery."

The patronage dividend method has the potential disadvantage, however, of being subject to the market price level for butterfat. If other buyers raise their prices to meet cooperative competition,

the patronage dividend payable may be reduced. This gives producers the impression that the benefits accruing because of cooperation have been reduced, particularly when conditions existing before the organization of the cooperative have been forgotten. To offset this false impression it is necessary to direct the attention of producers to the relation between their total payments for butterfat and the market value of butter—in other words, to the trend of margins discussed in the preceding sections.

It is an adage of marketing that two prices for the same product cannot exist at the same time in the same market. Thus, if one creamery operating on a pool basis pays prices higher than those of other butterfat buyers in the same area, the other buyers will tend to meet the higher prices or lose patronage. Since the more efficient continually attract more patronage and the less efficient lose volume the general level of prices in the area is raised. If the area affected is relatively small and competitors operate also in other places not so affected, they may go farther and elect to stage a "price war," to overpay the pooling cooperative in its own area. When this occurs, the cooperative has "started something"; it has, by its price policies, attracted "cut-throat competition." This procedure has resulted in several associations in the Mid-West organization shifting from the pool to the patronage-dividend basis.

The policy of paying current competitive prices and later patronage dividends does not upset the price structure of the local market to the same extent as do pool prices. As stated by one manager, "The lower the prices set by our competitors, the more money we make." Indeed, within limits, the difference between the returns of the least efficient handler who can stay in the business and those made by the others may be considered a profit to the others whether they are private operators or cooperatives. The cooperative may have the advantage since "no one knows what our final price is until the end of the year."

Membership and patronage in the cooperative are directly affected by the method used in the payment for butterfat. By extending the benefits of their operations to all producers of the area, pooling associations do not easily build membership in their own organization. To the extent that competitors are willing to "go along" on the current market prices paid by patronage-dividend associations, the method actually restricts the benefits to those producers who patronize the cooperative. The benefits can be obtained only by patronizing and in most cases by assuming the obligations of membership.

The method of distributing proceeds has important results upon members' obligations to finance the organization. In the first place, it requires more operating capital in proportion to business done to pay cash for each delivery than to defer payment until the proceeds

of sales have been received, because the earnings which accumulate throughout the year tend to provide extra operating capital. In fact, several associations had excess cash, which they invested in income-producing bonds or savings deposits pending distribution at the end of the year.

In the second place, necessity for retains to pay debts or to expand facilities means a direct reduction in pooled prices unless the retains are currently credited to patrons' accounts and such credits are accepted as part of current butterfat prices. As has been indicated, this was done in but one case among the Mid-West creameries that pooled. In lieu of this procedure, pooling associations are under extreme pressure to increase efficiency in order to set aside funds from current operations and still have their prices as high as competitors. Patronage-dividend associations, on the other hand, may and do retain portions of the earnings for expansion without appearing to disadvantage in the current prices paid; and patrons seem to accept stock readily in lieu of cash as patronage dividends, since it is "something extra" in either case.

Third, the payment of patronage dividends in stock, aside from providing a "painless" method for making retains, gives a ready method for making members of patrons. Deductions for membership in pooling associations appear to penalize the nonmember in current settlements, and often he refuses to submit to the deduction if he can obtain the "co-op price" from competitors.





## Other Publications Available

In addition to this circular, the following publications on farmers' cooperative organizations are published by the Farm Credit Administration:

- Cooperative Purchasing of Farm Supplies**  
Bulletin No. 1, *Joseph G. Knapp and John H. Lister*
- Accounting Principles for Cooperative Cotton Gin Associations**  
Bulletin No. 2, *Otis T. Weaver*
- Cooperative Marketing of Agricultural Products**  
Bulletin No. 3, *Ward W. Fetrow*
- Cooperation in Agriculture, a Selected and Annotated Bibliography**, Bulletin No. 4, *Chastina Gardner*
- Organization and Operation of the Illinois Livestock Marketing Association**, Bulletin No. 5, *H. H. Hulbert*
- Statistics of Farmers' Cooperative Business Organizations, 1920-1935**, Bulletin No. 6, *R. H. Elsworth*
- Cooperative Marketing of Range Livestock**  
Bulletin No. 7, *L. B. Mann*
- Membership Relations of Cooperative Associations**  
Bulletin No. 9, *J. W. Jones*
- Organization and Operating Problems of Nebraska Cooperative Creameries**, Bulletin No. 11, *T. G. Stitts and Gordon C. Laughlin*
- Analysis of the Business Operations of Cooperative Cotton Gins in Oklahoma, 1933-34**, Bulletin No. 12, *Otis T. Weaver and Omer W. Herrmann*
- Transportation of Milk in the Philadelphia Milkshed**  
Bulletin No. 13, *John J. Scanlan*
- Cooperative Organization of Iowa Farmers' Creameries**  
Bulletin No. 14, *Frank Robotka and Gordon C. Laughlin*
- Contract Feeding of Lambs and Cattle**, Bulletin No. 15, *C. G. Randell*
- Milk Cooperatives in Four Ohio Markets**  
Bulletin No. 16, *William C. Welden and T. G. Stitts*
- Commercial Trucking of Fruits and Vegetables in Nine Atlantic Coast States**, Bulletin No. 17, *Nephtune Fogelberg and H. W. Mumford, Jr.*
- Use of Motortrucks in Marketing Fruits and Vegetables**  
Bulletin No. 18, *Marius P. Rasmussen*
- Business Analysis of the Utah Poultry Producers' Cooperative Association** Bulletin No. 19, *John J. Scanlan*
- Cooperative Purchasing of Farm Supplies in Wisconsin**  
Bulletin No. 20, *Rudolph K. Froker and Joseph G. Knapp*
- Farmers' Mutual Windstorm Insurance**  
Bulletin No. 21, *Gordon A. Bubolz*
- Cooperative Purchasing of Farm Supplies in Mississippi**  
Bulletin No. 22, *John H. Lister and Gerald M. Francis*
- Problems and Trends in Farmers' Mutual Fire Insurance**  
Bulletin No. 23, *V. N. Valgren*
- Loans to Farmers' Cooperatives**, Circular No. 6
- Early Developments in Cooperative Cotton Marketing**  
Circular No. C-101, *O. W. Herrmann and Chastina Gardner*
- Organization and Operation of Cooperative Irrigation Companies**  
Circular No. C-102, *Wells A. Hutchins*
- Western Cattle and Sheep Areas**, Circular No. C-103, *L. B. Mann*
- Economic Analysis of Bargaining Problems of Milk Cooperatives**  
Circular C-104, *T. G. Stitts and Wm. C. Welden*
- Cooperative Fluid-Milk Associations in Iowa**  
Circular C-105, *Paul E. Quintus and T. G. Stitts*

*These may be obtained free of charge as long as a supply is available from the*

**Director of Information and Extension  
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