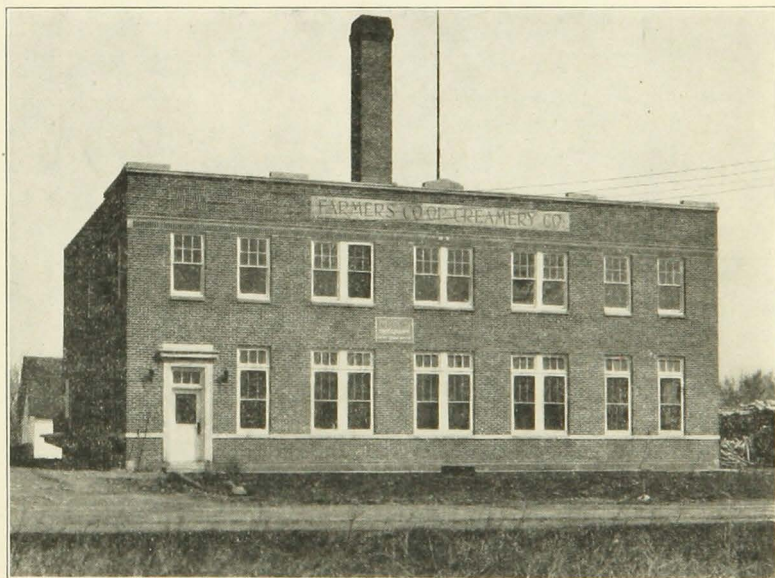


UNIVERSITY OF MINNESOTA
AGRICULTURAL EXPERIMENT STATION

CREAMERY BUSINESS ANALYSIS

LLOYD L. ULLYOT, HAROLD F. HOLLANDS
DIVISION OF AGRICULTURAL ECONOMICS



UNIVERSITY FARM, ST. PAUL

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CREAMERY BUSINESS ANALYSIS

LLOYD L. ULLYOT, HAROLD F. HOLLANDS

INTRODUCTION

The successful business manager requires immediate access to accurate data concerning his business and the costs and results of its operation. A satisfactory accounting system will provide such data. The absence of such a system often leads not only to inefficiency in operation and management, but to business failure itself.

The creamery business is no exception. Since a creamery may be engaged in the whole-milk business and in the sale of various sidelines, as well as in the processing and manufacturing of raw materials into one or more finished commodities, it is confronted with the problems of both commercial and manufacturing establishments. Such a creamery has a particular need for a good accounting system.

Every year each Minnesota creamery issues an annual report, which includes a statement of the financial condition of the creamery at the end of the year and a summary of the business operations during the year. This annual statement is prepared primarily for the benefit of patrons and directors, but it may also serve as a source of data for the annual report required by the State Department of Agriculture, Dairy, and Food. These reports, however, lack uniformity and are frequently vague as to the meaning of certain information. Patrons and directors often find it difficult to interpret the status of their own creamery organization and to determine its status in relation to that of other creameries. That there is a distinct need for standardization of accounting systems, including preparation of the annual report, is evident. Such standardization should result in an interchange of ideas and more sensible competition, as well as in increased efficiency and better business methods throughout the industry.

The purposes of this bulletin are to indicate the general types of information that should be included in an annual creamery report, to show patrons and other persons how to analyze and interpret such a report, and to indicate the general financial condition and the operating efficiency of the cooperative creameries included in the study. Some methods proposed in this publication are not now in common use among creameries. However, changes that aid in the analysis of creamery reports are warranted.

SOURCE OF MATERIAL

The material used for analysis in this bulletin came from two general sources—one, the audit reports of certain Minnesota creameries for the year ending December 31, 1931; the other, the annual creamery reports for the same year made to the Minnesota Department of Agriculture, Dairy, and Food. The audit reports selected were from those cooperative creameries which made practically all of their butterfat into butter and which had only a small sideline business that did not require extra space or labor. Creameries selling large quantities of butterfat in the form of milk, cream, or ice cream were excluded, as were also those having buttermilk driers. The reports to the Agriculture, Dairy, and Food Department were selected in the same way. In addition, analysis was made only of the reports in which the balance sheet checked properly and the income and expense statement, as well as the statistical memoranda, appeared to be accurate and complete.

This selection gave 117 cooperative creameries which were well distributed throughout the counties of the state, but which differed in volume. The creameries were classified according to volume in pounds of butter made.

Table 1.—Creameries Classified On the Basis of Pounds of Butter Made*

Group number	Group range	Number in group
I	Under 125,000 pounds of butter.....	6
II	Between 125,000 and 250,000 pounds.....	48
III	Between 250,000 and 375,000 pounds.....	34
IV	Between 375,000 and 500,000 pounds.....	16
V	Between 500,000 and 625,000 pounds.....	6
VI	More than 625,000 pounds.....	7
A	Total	117

* Patrons think in terms of pounds of butterfat. Appendix B provides the data for these same 117 creameries classified in six groups on the basis of pounds of butterfat purchased. The cost analysis is also given on a per-pound-of-butterfat basis.

PURPOSES AND CONTENTS OF AN ANNUAL CREAMERY REPORT

An annual report should provide the specific information needed to determine, first, the financial status of a business, and, second, the results of the year's business operations. This information is for the use of managers, directors, stockholders, and patrons, as well as for creditors, governmental agencies, and the general public. To serve these two purposes adequately, the report must contain the following three statements:

1. A balance sheet, which is a statement of the financial condition of a business at the time the annual report is made.

2. An operating statement, which shows the various sources of income and the kinds of expenses incurred.
3. A statistical statement, which shows the quantities of commodities handled and the average prices received and paid for these commodities. From these data may be determined such information as the per cent of overrun and the expenses per pound of butter made.

ANALYSIS AND METHODS OF INTERPRETING A BALANCE SHEET

The balance sheet is the most important part of the annual report. It is logically divided into three main parts, namely, assets, liabilities, and net worth. This is shown in the balance sheet of the X Cooperative Creamery Association, Schedule 1, page 6.

Definitions of Balance-Sheet Items

Assets include all properties and property rights having monetary value owned or receivable by the business.

Current assets are cash and other assets readily convertible into cash through the regular operation of a business.

Investment assets are the values of stocks, bonds, and certificates of indebtedness issued by other businesses and held by this business.¹

Fixed assets are those of a permanent nature used in the operation of the business and not intended for sale.

Other assets include such items as prepaid insurance premiums, interest paid in advance, inventories of supplies on hand, and prepaid advertising expenses.

Liabilities are the creditors' equity in, or claims against, the assets of the business.

Current liabilities are the claims that become due or payable within one year from the date of the balance sheet.

Fixed liabilities are the claims that do not become due or payable within one year from the date of the balance sheet.

Net worth is the owners' equity in, or claims against, the assets of the business.

Capital stock is the par value of the outstanding stock in the hands of the stockholders at the time the balance sheet is made.

Surplus is the difference between the net worth and the par value of capital stock outstanding.

¹ Frequently investment assets may be turned into cash immediately at face value. Since this is not done by creameries in the regular operation of their business, such assets are considered investment rather than current assets.

**Schedule 1.—The X Cooperative Creamery Association Balance Sheet,
December 31, 193—**

CURRENT:		Assets	
Cash:			
Undeposited Cash on Hand.....		\$	
Cash in Banks—Checking Accounts.....		\$	
Cash in Banks—Savings Accounts.....		\$	
Total Cash.....			\$
Accounts and Notes Receivable:			
Accounts Receivable—General.....	\$		
Accounts Receivable—Patrons.....	\$		
Notes Receivable.....	\$		
Total Accounts and Notes Receivable.....		\$	
Less Reserves for Doubtful Accounts and Notes Receivable.....		\$	
Book Value of Accounts and Notes Receivable..			\$
Accrued Interest Receivable.....		\$	
Inventories:			
Dairy Products.....		\$	
Sidelines.....		\$	
Total Inventories.....			\$
Total Current Assets.....			\$
INVESTMENTS:			
Stock of Other Organizations.....		\$	
Bonds.....		\$	
Certificates of Indebtedness.....		\$	
Total Investment Assets.....			\$
FIXED:			
Land.....		\$	
Buildings.....		\$	
Less Reserve for Depreciation—Buildings.....		\$	
Machinery and Equipment.....		\$	
Less Reserve for Depreciation—Machinery and Equip- ment.....		\$	
Delivery Equipment.....		\$	
Less Reserve for Depreciation—Delivery Equipment		\$	
Office Equipment.....		\$	
Less Reserve for Depreciation—Office Equipment..		\$	
Total Fixed Assets.....			\$
OTHER:			
Prepaid Insurance.....		\$	
Supplies Inventories.....		\$	
Total Other Assets.....			\$
Total Assets.....			\$
		Liabilities	
CURRENT:			
Accounts and Notes Payable:			
Accounts Payable—General.....	\$		
Accounts Payable—Patrons.....	\$		
Notes Payable.....	\$		
Total Accounts and Notes Payable.....			\$
Dividends Payable:			
Interest on Capital Stock.....	\$		
Patronage Dividends.....	\$		
Total Dividends Payable.....			\$
Accrued Expenses:			
Interest on Loans Payable.....	\$		
Salaries and Wages.....	\$		
Taxes.....	\$		
Total Accrued Expenses.....		\$	
Total Current Liabilities.....			\$
FIXED:			
Mortgage Payable.....		\$	
Bonds Payable.....		\$	
Total Fixed Liabilities.....			\$
Total Liabilities.....			\$
		Net Worth	
CAPITAL STOCK:			
Authorized.....		\$	
Less: Unissued.....		\$	
Treasury.....		\$	
Outstanding.....		\$	
Subscriptions.....		\$	
Total Capital Stock.....			\$
SURPLUS:			
Accumulated from Previous Years.....		\$	
Undistributed Earnings—Current Period.....		\$	
Total Surplus.....			\$
Total Net Worth.....			\$
Total Liabilities and Net Worth.....			\$

Schedule 2.—The X Cooperative Creamery Association Balance Sheet, December 31, 193—

Assets			Liabilities		
CURRENT:			CURRENT:		
Cash:			Accounts and Notes Payable:		
Undeposited Cash on Hand.....	\$		Accounts Payable—General	\$	
Cash in Banks—Checking Accounts	\$		Accounts Payable—Patrons	\$	
Cash in Banks—Savings Accounts	\$		Notes Payable	\$	
Total Cash	\$		Total Accounts and Notes Payable	\$	
Accounts and Notes Receivable:			Dividends Payable:		
Accounts Receivable—General.....	\$		Interest on Capital Stock.....	\$	
Accounts Receivable—Patrons	\$		Patronage Dividends	\$	
Notes Receivable	\$		Total Dividends Payable.....	\$	
Total Accounts and Notes Receivable	\$		Accrued Expenses:		
Less Reserves for Doubtful Accounts and Notes Receivable.....	\$		Interest on Loans Payable.....	\$	
Book Value of Accounts and Notes Receivable	\$		Salaries and Wages.....	\$	
Accrued Interest Receivable.....	\$		Taxes	\$	
Inventories:			Total Accrued Expenses.....	\$	
Dairy Products	\$		Total Current Liabilities.....	\$	
Sidelines	\$		FIXED:		
Total Inventories	\$		Mortgage Payable.....	\$	
Total Current Assets.....	\$		Bonds Payable	\$	
INVESTMENTS			Total Fixed Liabilities.....	\$	
Stock or Other Organizations.....	\$		Total Liabilities	\$	
Bonds	\$		Net Worth		
Certificates of Indebtedness.....	\$		CAPITAL STOCK:		
Total Investment Assets.....	\$		Authorized	\$	
FIXED:			Less: Unissued	\$	
Land	\$		Treasury	\$	
Buildings	\$		Outstanding	\$	
Less Reserve for Depreciation—Buildings	\$		Subscriptions	\$	
Machinery and Equipment	\$		Total Capital Stock.....	\$	
Less Reserve for Depreciation—Machinery and Equipment.....	\$		SURPLUS:		
Delivery Equipment	\$		Accumulated from Previous Years...	\$	
Less Reserve for Depreciation—Delivery Equipment	\$		Undistributed Earnings—Current Period	\$	
Office Equipment.....	\$		Total Surplus	\$	
Less Reserve for Depreciation—Office Equipment	\$		Total Net Worth	\$	
Total Fixed Assets.....	\$		Total Liabilities and Net Worth.....	\$	
OTHER:					
Prepaid Insurance	\$				
Supplies Inventories	\$				
Total Other Assets.....	\$				
Total Assets	\$				

A deficit is the amount that the sum of the stock outstanding and liabilities exceeds the book value of assets.

Since the total investment in the assets of a business is composed of the two parts, (1) creditors' investments, or liabilities, and (2) owners' investments, or net worth, it follows of necessity that the sum of the liabilities and net worth must always equal the amount of total assets.

Balance-Sheet Forms

The arrangement and presentation of the data contained in a balance sheet may take either one of two conventional forms known as the account form and the report form. The account form (Schedule 2, page 7) gets its name from the way the data are arranged, the assets on the left and the liabilities and net worth on the right corresponding to the left and right sides of ledger accounts. The report form (page 6) gets its name from the fact that it is frequently used by auditors in making reports on the financial status of a business. It is convenient for this purpose because it is adapted to printing on common-sized correspondence paper. Each form affords the same detail with respect to titles and amounts, and each uses identical headings and gets the same number of intermediate totals of groups, as well as the same number of classes of data. The report form, however, is the better one to use because of its greater convenience.

Balance-Sheet Analysis

A balance-sheet analysis may take any one or all of three different forms. A single business may be analyzed at a particular time; or the analysis may consist of a comparison of balance sheets of the same date but for several businesses of similar size and general type; or it may be a comparison of balance sheets for the same business, but made for different years. The first two types of analysis will be discussed in some detail, but less attention will be given to the third.

The first question answered by a balance sheet is whether or not the business is solvent. A frequent error is to assume that the larger the cash balance a business has in a bank, the stronger is its financial condition. The solvency of a business depends upon the relation between the total value of all property belonging to the company (assets) and the total value of all claims against the property or business, which is the sum of the liabilities and outstanding capital stock. The comparison is made by finding the difference between assets and the combined value of liabilities and outstanding capital stock. When the assets are the larger, there is a surplus and the business is solvent. If the

combined value of liabilities and capital stock is the larger, there is a deficit and the business is insolvent. When the two are exactly equal, the business is solvent and there is neither a surplus nor a deficit. If a business having a surplus were terminated, and if the balance-sheet value of assets were obtained, the money left after paying all liabilities to creditors and owners would be prorated to the owners in proportion to the number of shares of stock held by each. When a business is insolvent, it cannot completely satisfy the claims of its creditors and stockholders; that is, it cannot pay 100 cents on each dollar owed. When this condition exists, or even before, the creditors or stockholders may petition the court to declare the concern bankrupt and to appoint a trustee to terminate its affairs. The state bankruptcy laws determine the distribution of a deficit among the creditors and stockholders.

To assist further in the analysis, there are a number of ratios which may be used. A ratio expresses a relationship or comparison between the numerical size of two items. For example, if the current assets of a business are \$100,000 and its current liabilities are \$50,000, a ratio of 2 is found by dividing the first amount by the second amount. It frequently happens that a ratio is less than one. A list of ratios to be used and the significance of each ratio follows:

Table 2.—Balance Sheet and Turn-over Ratios

$\frac{\text{CURRENT ASSETS}}{\text{CURRENT LIABILITIES}}$	Is the business likely to continue to be solvent? A large ratio indicates favorable chances of continued solvency.*
$\frac{\text{NET WORTH}}{\text{TOTAL LIABILITIES}}$	What is the debt burden of the business? The larger the ratio is, the lighter the debt burden.
$\frac{\text{NET WORTH}}{\text{FIXED ASSETS}}$	Are the owners financing the entire fixed investment? If the ratio is one or more than one, yes; if less than one, no.
$\frac{\text{NET WORTH}}{\text{CAPITAL STOCK}}$	Is the business holding its own from year to year? Comparison must be made for several years. It is desirable that the ratio be considerably greater than one.
$\frac{\text{FIXED LIABILITIES}}{\text{FIXED ASSETS}}$	To what extent are the fixed assets mortgaged? The smaller the ratio is, the less heavily mortgaged are the fixed assets.
$\frac{\text{POUNDS OF BUTTER}}{\text{FIXED ASSETS}}$	How efficiently are the fixed assets used? The larger the ratio is, the more butter is made per dollar invested in fixed assets.

* This ratio may be made larger by having current assets include any investment assets. This may be desirable for credit purposes.

The first ratio, that of current assets to current liabilities, is an index of the ability of a business to pay its debts inasmuch as it shows whether or not a concern can meet its current obligations. A ratio of one should be the lowest limit. The larger the ratio, the more likelihood there is that creditors will receive prompt and complete payment

on demand. How large this ratio should be depends on the character of the current assets and on the method of financing used. A ratio considerably greater than one is desirable if a large part of the current assets consists of inventory values which are subject to drastic price declines. Large ratios should exist in cases where the business is financed by the sale of bonds, since the claims of the current creditors to the fixed assets are secondary to the claims of bondholders and mortgagees.

The ratio of net worth to total liabilities shows the relationship between the two main sources of capital and expresses the number of dollars of owners' capital in the business for each dollar of creditors' capital used. The larger the ratio, the less is owed to creditors per dollar of owners' investment; therefore the lighter the debt burden and the less justification for criticism of being top-heavy with debt.

Who is financing the fixed assets? If the ratio of net worth to fixed assets is one or greater than one, the owners are financing the entire fixed investment. In the case of cooperatives, capital stock and surplus ordinarily should provide the funds for financing fixed assets, and the larger the ratio is, the stronger is the position of the creditors. This should make it easier for the business to borrow money.

The ratio of net worth to capital stock gives the book value of each dollar invested by stockholders in case of capital stock corporations. The larger the surplus, the larger is this ratio. Altho the objective of cooperative creameries is to return as high a net price as possible to patrons for produce rather than to pay large dividends to stockholders, or to increase the value of capital stock, nevertheless it is desirable to maintain a reasonable surplus. This surplus will provide some of the working capital and will safeguard the financial condition in the event of unexpected losses or unusual risks involved in the operation of the business. Since unusual conditions may cause this ratio to be very high or low at a particular time, too much significance must not be placed on its size at any one time. Instead, it is better to compare ratios for different years to learn whether or not the business is maintaining itself. If the ratio remains practically the same or is increasing in size over a period of years, it is evident that the business is at least holding its own. Explanations of marked variations should be sought.

To what extent are the fixed assets mortgaged? The ratio of fixed liabilities to fixed assets should show to what extent the latter are mortgaged. The smaller the ratio is, the less heavily are the fixed assets mortgaged. Fixed assets should be financed, insofar as possible,

by owned capital, that is, capital stock and surplus. When the owned capital is inadequate, recourse should be made to long-term loans secured by mortgages on fixed assets. When the ratio is high there will be greater difficulty in obtaining short-term loans because of the poorer security afforded. Heavy mortgages on fixed assets lessen the secondary support for current borrowing.

The ratio of pounds of butter to fixed assets is a turn-over ratio and shows the number of pounds of butter made for each dollar of fixed assets. In a sense this figure shows how efficiently or completely the fixed assets are being used. The larger the ratio is, the greater the number of pounds that have been made per dollar of fixed assets. As the size of this ratio increases, the more likely is the investment in fixed assets to be justifiable and profitable.

BALANCE SHEETS OF 117 CREAMERIES

The 117 creameries included in this study have been classified on the basis of volume of business as indicated by the number of pounds of butter made annually (page 4). Table 3, page 12, shows the arithmetic average of the balance sheets for the entire 117 creameries and the average for the creameries in each group taken separately. For instance, the average value of current assets for all the groups combined was computed by adding the current assets of the 117 creameries and dividing that sum by 117. The average value of capital stock is the sum of the capital stock of all 117 creameries divided by 117. The other columns show the average for their particular group. For instance, the six small creameries (under 125,000 pounds of butter made) had average fixed assets of \$6,692.56. This value was found by adding the fixed assets of these six small creameries and dividing this sum by six to get the average for the group. In like manner, the average value of the other items in each group was obtained. The reader's attention is called especially to Groups I, V, and VI. Each of these contained so small a number of creameries as to make strictly mathematical comparisons of questionable value.

The need for larger plant, more operating capital, and larger surplus makes it reasonable to expect that current, fixed, and total assets, current and total liabilities, and surplus and net worth will increase in actual amount as volume becomes larger. This tendency is clearly evident in Table 3. However, it will be noticed that Group V varied somewhat from what might be expected. This is shown in the case of fixed assets and current and total liabilities, all three of which were smaller than the corresponding amounts for Group IV creameries.

However, this is not serious and is probably due to the fact that there are in this group only six creameries, three of which had unusually small liabilities and fixed investments and consequently are not representative of this group.

Table 3.—Condensed Balance Sheet Showing the Average Financial Condition of 117 Minnesota Cooperative Creamery Associations, Classified According to Pounds of Butter Made as of December 31, 1931

	Average All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
No. of Creameries	117	6	48	34	16	6	7
ASSETS:							
Current	\$ 5,661.28	\$1,201.26	\$ 3,104.06	\$ 6,363.28	\$ 7,343.48	\$11,156.46	\$15,054.40
Investments	1,083.38	557.46	741.00	1,227.76	1,961.06	976.21	1,266.30
Fixed	14,446.42	6,692.56	11,462.84	16,172.09	17,518.87	16,070.00	24,755.23
Other	1,048.19	582.12	846.35	1,311.38	1,057.67	1,099.56	1,487.73
Total Assets...	\$22,239.27	\$9,033.40	\$16,154.25	\$25,074.51	\$27,881.08	\$29,302.23	\$42,563.66
LIABILITIES:							
Current	4,439.37	1,282.08	3,533.41	4,542.49	6,816.34	4,544.45	7,333.94
Fixed	1,664.71	922.65	1,651.33	2,690.33	875.00	.....	642.86
Total Liabilities	\$ 6,104.08	\$2,204.73	\$ 5,184.74	\$ 7,232.82	\$ 7,691.34	\$ 4,544.45	\$ 7,976.80
NET WORTH:							
Capital Stock....	5,842.27	3,206.87	5,359.75	7,069.58	6,091.43	3,889.42	6,552.89
Surplus	10,292.92	3,621.80	5,609.76	10,772.11	14,098.31	20,868.36	28,033.97
Total Net Worth	\$16,135.19	\$6,828.67	\$10,969.51	\$17,841.69	\$20,189.74	\$24,757.78	\$34,586.86
Total Liabilities and Net Worth....	\$22,239.27	\$9,033.40	\$16,154.25	\$25,074.51	\$27,881.08	\$29,302.23	\$42,563.66

In considering capital stock, it is interesting to note that no systematic variation is apparent. This is to be expected because methods of financing are not dependent on the number of pounds of butter made by a creamery. However, the larger the volume of business is, the larger the surplus should be to protect that business, and surpluses should increase in size from small to large creameries. Table 3 shows clearly that this was the situation. The average surplus for the smallest-production group was \$3,621.80, while the average surplus for the largest-production group was \$28,033.97. Likewise, net worth was greater for the larger creameries than it was for the smaller ones.

A complete balance-sheet analysis which represents either an individual creamery or an average of several creameries involves a study of the distribution of assets and liabilities. Hence, it is important to know what per cent of total assets, current assets are, and what per cent of total liabilities and net worth, current liabilities are. Table 4 (page 13) has been prepared to show the average percentage distribution of the individual items of the 117 creameries as a whole and of each of

Table 4.—Percentage Analysis of the Condensed Balance Sheet Showing the Average Financial Condition of 117 Minnesota Cooperative Creamery Associations Classified According to Pounds of Butter Made as of December 31, 1931

	Average All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
No. of Creameries	117	6	48	34	16	6	7
ASSETS:							
Current	25.46%	13.30%	19.21%	25.38%	26.34%	38.07%	35.36%
Investments	4.87	6.17	4.59	4.89	7.03	3.34	2.98
Fixed	64.96	74.09	70.96	64.50	62.84	54.84	58.16
Other	4.71	6.44	5.24	5.23	3.79	3.75	3.50
Total Assets	100.00	100.00	100.00	100.00	100.00	100.00	100.00
LIABILITIES:							
Current	19.96	14.20	21.87	18.12	24.45	15.51	17.23
Fixed	7.49	10.21	10.22	10.73	3.13	....	1.51
Total Liabilities	27.45	24.41	32.09	28.85	27.58	15.51	18.74
NET WORTH:							
Capital Stock	26.27	35.50	33.18	28.19	21.85	13.27	15.40
Surplus	46.28	40.09	34.73	42.96	50.57	71.22	65.86
Total Net Worth	72.55	75.59	67.91	71.15	72.42	84.49	81.26
Total Liabilities and Net Worth	100.00	100.00	100.00	100.00	100.00	100.00	100.00

the groups of creameries.² For instance, in Group I current assets were 13.30 per cent of total assets, while in Group VI current assets were 35.36 per cent of total assets. The current assets increased relatively to the total assets as the volume of business increased. This increasing relative importance of current assets is due, on the one hand, to the larger requirements of cash, accounts receivable, and inventories as business increases in size, and, on the other, to the increased efficiency in the use of fixed assets that may accompany growth in volume. (This will be discussed later.)

² Illustrations of the calculation of percentage figures in Table 4.

Note: The column of "Average for All Groups" is used for the illustration.

$$1. \text{ Per cent current assets equals } \frac{\text{current assets}}{\text{total assets}} = \frac{5,661.28}{22,239.27} \text{ (Table 3) } = 25.46 \text{ per cent (Table 4).}$$

$$2. \text{ Per cent fixed assets equals } \frac{\text{fixed assets}}{\text{total assets}} = \frac{14,446.42}{22,239.27} \text{ (Table 3) } = 64.96 \text{ per cent (Table 4).}$$

$$3. \text{ Per cent current liabilities equals } \frac{\text{current liabilities}}{\text{total liabilities and net worth}} = \frac{4,439.37}{22,239.27} \text{ (Table 3) } = 19.96 \text{ per cent (Table 4).}$$

$$4. \text{ Per cent surplus equals } \frac{\text{surplus}}{\text{total liabilities and net worth}} = \frac{10,292.92}{22,239.27} \text{ (Table 3) } = 46.28 \text{ per cent (Table 4).}$$

Exactly this same procedure was followed for each of the other groups of creameries.

An examination of liabilities and net worth indicates that there is some evidence of a general tendency for the larger-volume creameries to have a somewhat smaller percentage of liabilities and a somewhat larger percentage of net worth. The smaller percentage of liabilities may be due to the smaller percentage of fixed liabilities. The higher percentage of surplus maintained by the larger creameries probably accounts for their larger percentage of net worth. Each of the two groups of larger volume had a much smaller percentage of liabilities than the average for the entire 117 creameries. Also, these same two large-production groups had a larger percentage of net worth than the average for all the groups. Apparently, volume may be an important factor in influencing the financial status of creameries.

Before proceeding to a more detailed analysis of the balance sheets of the various groups of creameries as given in Table 3, it is well to recall that a balance sheet is a statement of the financial condition of a business at a specified time. Not only does an analysis of the balance sheet provide for a comparison of certain items and ratios as between groups of creameries, but it also provides means whereby the individual creamery operator may compare the financial situation of his own creamery business with that representing the average of the creameries of similar volume, or with that representing the average of all creameries. In addition, the individual operator may compare the present financial status of his business with previous years and thereby determine the growth in strength or weakness of his particular organization and the underlying causes of the same.

It has been indicated that a complete analysis of the financial condition of an organization involves the determination of certain relationships between particular items of the balance sheet. The following discussion represents an application made to the various groups of creameries of the standards which have been set as a basis of analysis.

A business is solvent when total assets are equal to or greater than the sum of total liabilities and capital stock. For instance the "average of all groups" column in Table 3, shows total liabilities of \$6,104.08, which added to the capital stock of \$5,842.27 equals \$11,946.35. If this sum were subtracted from total assets (\$22,239.27), there would be a remainder of \$10,292.92, which would be surplus. This means that the business can pay all its creditors and stockholders and have this surplus left, providing it can dispose of its assets at book value. All six groups of creameries and the average for all 117 showed a surplus and therefore solvency.

Table 5 shows the various ratios for the respective groups of creameries in the study. The first ratio deals with the important question, is

Table 5.—Balance Sheet and Turn-over Ratios Reflecting the Average Financial Condition of 117 Minnesota Cooperative Creamery Associations Classified According to Pounds of Butter Made as of December 31, 1931

Column No.	No. of Creameries	Ratio of Current Assets to Current Liabilities	Ratio of Net Worth to Total Liabilities	Ratio of Net Worth to Fixed Assets	Ratio of Net Worth to Capital Stock	Ratio of Fixed Liabilities to Fixed Assets	Ratio of Pounds of Butter to Fixed Assets
1	2	3	4	5	6	7	
All Groups....	117	1.27	2.64	1.12	2.76	0.12	21.19
Group I.....	6	0.94	3.10	1.02	2.13	0.14	15.59
Group II.....	48	0.88	2.12	0.96	2.05	0.14	16.61
Group III....	34	1.40	2.47	1.10	2.52	0.17	18.68
Group IV....	16	1.08	2.62	1.15	3.31	0.05	23.81
Group V.....	6	2.45	5.45	1.54	6.37	...	33.74
Group VI....	7	2.05	4.34	1.40	5.28	0.03	33.77

the business likely to continue to be solvent. This ratio is shown for the various groups of creameries in column 2, Table 5. The ratio for each creamery group was found by dividing the sum of the current assets of the creameries in the group by the sum of the current liabilities of these same creameries. This method gave a weighted average and was used in computing the different ratios in this study. Considerable difference between this ratio for small- and for large-volume creameries is indicated in column 2. The ratio shows that on the average the creameries in the two small-volume groups could not meet their current obligations, since they averaged only 94 and 88 cents, respectively, with which to pay each dollar of current liabilities. On the other hand, the creameries of larger volume averaged more than two dollars of current assets with which to pay each dollar of current liabilities. Evidently some of the smaller-volume creameries included were handicapped by having insufficient operating capital and might be forced into bankruptcy because of inability to meet current obligations. A creamery, regardless of its volume of business, should have enough current assets to meet its current obligations.

Another ratio may be used to indicate the debt burden of a business. It is found by dividing the net worth by the total liabilities. For each group of these creameries, it was found by dividing the sum of the net worth of the creameries in the particular group by the sum of their total liabilities. This ratio for each of the volume groups is shown in column 3, Table 5. The ratio indicates the average number of dollars of owners' money invested in the business for each dollar of creditors' money invested in it. The larger the ratio is, the smaller is the proportion of creditors' money, and hence the lighter is the debt burden on the business itself. Column 3 shows that on the average the creameries in the two larger-volume groups had the most favorable ratios. Group V, which includes several well-financed creameries, was outstanding in

this respect. The high average ratio of the creameries in Group I probably was due to the small number of creameries in this group.

The ratio of net worth to fixed assets for the different volume groups is shown in column 4. These values were computed in the same general manner as were the first two ratios. In this case, there also is a noticeable tendency for the ratio to increase in size as the volume of business increases. On the average, only the creameries in the three larger-volume groups had ratios greater than the average ratio for all the creameries taken together. In the case of Group V, the creameries had an average of \$1.54 of capital stock and surplus for every dollar invested in fixed assets. Only creameries in Group II averaged fewer dollars of net worth than dollars of fixed assets. This indicates that, on the average, these creameries had not entirely financed their fixed assets from capital stock and surplus. Creditors usually are more willing to loan, and at lower rates of interest, to organizations that have financed their fixed assets from capital stock and surplus. In consequence, creameries with large volume of business may have an advantage both in the rate paid on loans and in the ease of borrowing.

The ratio of net worth to capital stock is shown in column 5. The figure for each group is a weighted average of the ratios for the individual creameries in the group and was computed by the same method as were the three other ratios. This ratio is especially useful for comparing the balance sheets of a business for different dates when the object is to study the general trend of the financial growth of that business. Column 5 shows the average value of the ratio of net worth to capital stock for the various groups of creameries. Altho the aim of a cooperative creamery is not to establish an excessively large surplus or to increase the value of the stock excessively, nevertheless, good business management demands that a surplus sufficient to meet reversals or unexpected losses be accumulated. It is to be expected, then, that large-volume creameries would have larger actual amounts of surplus than small creameries. This column indicates that, on the average, the large-volume creameries had surpluses which were also relatively larger (ratio of net worth to capital stock) than the average of small-volume creameries. The average ratio for the creameries in each of the three large-volume groups was more than the average ratios of the creameries in the three small-volume groups. For instance, in Group V, a ratio of 6.37 indicates that on the average for each dollar invested by stockholders in the large-volume creameries in this particular group, there was an average book value of \$6.37 at the time the balance sheets were made. Care must be used in evaluating this particular ratio for any given time. In general, it should be used in comparing the status of a business at dif-

ferent points in time. However, Table 5 indicates a clear tendency for this ratio to be larger in large-volume creameries than in small-volume ones. It appears that an investment in stock of creameries having large volume is likely to have higher book value than if it had been put into small-volume creameries. This statement is based on averages and of course does not apply to all individual cases.

The ratio of fixed liabilities to fixed assets, given in column 6, indicates not only the extent to which the fixed assets are mortgaged as security for fixed liabilities, but also the relative ease or difficulty in securing necessary short-term loans. Column 6 indicates that there is considerable difference between the small- and large-volume creameries in this respect. The average for all the 117 creameries in the study was 12 cents of fixed liabilities for each dollar of fixed assets; the average amount for the creameries in all three of the small-volume creamery groups was more than 12 cents, and the average amount of fixed liabilities for all the creameries in each of the three large-volume creamery groups was less than 12 cents. The largest-volume creameries, those in Group VI, averaged only three cents of fixed liabilities for each dollar of fixed assets. The average for the creameries in Group V was still less, because none of these particular six creameries had any fixed liabilities. It is evident from these data that large-volume creameries tend to have relatively smaller mortgages on fixed assets as security for long-term loans than do the small-volume creameries. Very likely creditors would be more willing to make short-term loans to creameries having small fixed liabilities in relation to fixed assets because of the better security afforded.

The last column in Table 5 shows a turn-over ratio between pounds of butter made and the number of dollars of fixed assets. The most noticeable characteristic of this column is the increase in size of the ratio with the increase in volume of creameries. For all the 117 creameries, the average number of pounds of butter made per dollar of fixed assets was 21.19. The creameries included in each of the three small-volume groups averaged ratios smaller than this, while the average ratio for the creameries in the three large-volume groups was more than 21.19. The creameries of largest volume had an average ratio of 33.77, which was more than twice as many pounds of butter made per dollar of fixed assets as the average for the creameries in the two smaller-volume groups. The large-volume creameries were able to use their fixed assets more efficiently. It appears that the average, small, well-managed creamery may be at some disadvantage in competing with a large, well-managed one.

This same type of analysis may be applied to balance sheets of a given creamery for different periods when making a study of the progress of the business. It will supply information essential to the formulation of a sound business policy.

Too much confidence should not be placed in the various tests and measures of financial condition of a creamery. These measures and tests are merely tools to be used in the analysis, and as such have their special uses and definite limitations. The use of these tests and measures coupled with a proper understanding of their limitations and with a good supply of common sense and sound business judgment will prove to be invaluable to the management in determining whether or not the creamery is successful and in making decisions relative to the conduct of the business.

THE OPERATING STATEMENT

The second type of information which an annual creamery report must contain is an operating statement, which is a summary of the income earned and of the expenses incurred by the business during the year. It should show the operating income, the operating expenses, the non-operating income, and the non-operating expenses. It will provide the information needed to determine the earnings or losses of the various activities of the business and will help to explain why one creamery pays more for butterfat than another.³

Schedule 3.—Condensed Income and Expense Statement of The X Cooperative Creamery Association for the Year Ending December 31, 193—

1. Sales of Dairy Products (See Schedule 4).....	\$
2. Less:	
3. Cost of Dairy Products Sold (See Schedule 5).....	\$
4. Gross Income from Sales of Dairy Products.....	\$
5. Less:	
6. Selling Expenses (See Schedule 6).....	\$
7. Net Income from Sales of Dairy Products.....	\$
8. Less:	
9. General and Administrative Expenses (See Schedule 7).....	\$
10. Net Operating Income.....	\$
11. Add:	
12. Other Income (See Schedule 8).....	\$
13. Total	\$
14. Less:	
15. Other Deductions (See Schedule 10).....	\$
16. Net Earnings for the Year.....	\$

The condensed income and expense statement of the X Cooperative Creamery (Schedule 3), has been divided, for purposes of explanation, into four parts. The first division consists of items relating to total sales of all dairy products and to the cost of dairy products sold, and involves the determination of the gross margin. Total sales

³ Schedule 11, page 27, shows a complete Income and Expense statement.

Schedule 4.—Sales of Dairy Products of The X Cooperative Creamery Association for the Year Ending December 31, 193—

Butter		
Shipped	\$	
Local	\$	
Patrons	\$	
Total Sales of Butter.....		\$
Cream		
Shipped	\$	
Local	\$	
Total Sales of Cream.....		\$
Milk.....		\$
Buttermilk.....		\$
Total Sales of Dairy Products.....		\$

of butter (Schedule 4) has three sub-headings, namely, shipped, local, and patrons. Butter sold to patrons is called patrons' butter, butter sent out of the immediate community is classed as butter shipped, and all other butter sold is classified as local butter. Sales of small amounts of cream, milk, and buttermilk appear here as a part of the sales of dairy products.⁴

The "cost of dairy products sold" (Schedule 5) is the total amount paid during a given period of time for butterfat, cream hauling, creamery labor, and costs of manufacturing the butterfat into butter. A large part of the amount the creamery gets for a pound of butter is paid the patron for the butterfat he furnishes as raw material. Therefore, this

Schedule 5.—Cost of Dairy Products Sold By The X Cooperative Creamery Association for the Year Ending December 31, 193—

Inventory of Dairy Products—January 1, 193—.....		\$
Add:		
Cost of Dairy Products Manufactured		
Raw Material		
Inventory of Butterfat—January 1, 193—.....	\$	
Butterfat Purchases	\$	
Hauling Butterfat	\$	
Total	\$	
Less: Inventory of Butterfat—December 31, 193—	\$	
Total Cost of Raw Material.....		\$
Labor		\$
Manufacturing Expense		
Heat, Light, Power	\$	
Factory Supplies, Packages, Wrappers.....	\$	
Repairs	\$	
Depreciation—Buildings.....	\$	
Depreciation—Machinery and Equipment.....	\$	
Insurance	\$	
Taxes	\$	
Dues	\$	
Miscellaneous Manufacturing Expense.....	\$	
Total Manufacturing Expense.....		\$
Total Cost of Dairy Products Manufactured....		\$
Total of Inventory of Jan. 1, 193—, and Cost of Dairy Products Manufactured		\$
Less:		
Inventory of Dairy Products—December 31, 193—.....		\$
Total Cost of Dairy Products Sold.....		\$

⁴ See A, Schedule 11, p. 27.

butterfat is actually a cost to the creamery, even tho some patrons do not think of butterfat as a cost. However, the butterfat purchased, the cream hauling and the creamery labor expense, and the costs of manufacturing butter during the days of one calendar year ordinarily do not cover exactly all the costs of dairy products sold. Some butter is made on the last few days of December and is held over and sold during the early part of the current year. Some of the butter made during the current year is not sold until the first days of January of the next year. Corrections must be made for these supplies of butter and other dairy products on hand at the beginning and end of the year if an accurate comparison is to be made with the sales during other similar twelve-month periods. These adjustments are made by adding to the cost of dairy products manufactured during the particular year the cost of the dairy products on hand January 1 (opening inventory), and by subtracting from this total the cost of dairy products on hand December 31 (closing inventory). Market value, instead of cost, is used if it is a smaller amount. When this addition and subtraction of inventories have been completed, the cost of dairy products sold is obtained (Schedule 5) for all dairy products actually sold during the period being considered. If this figure is subtracted from the total sales of dairy products, the difference represents the gross income from sales of dairy products during the year (Schedule 3, lines 1-4, inclusive).

Schedule 5, page 19, shows in some detail the items that constitute raw materials, creamery labor, and manufacturing expenses. The cost of raw materials is the largest single item. If a large quantity of butterfat is sold as sweet cream it should be charged to the cream account, as explained later.⁵ The only butterfat that should be charged is that used during the year or period of time in question. This means, as in the case of butter itself, that butterfat on hand January 1 carried over from the last few days of December should be added to the amount purchased during the year; while any butterfat bought during the last few days of the current year and not churned until the first days of January should be subtracted in order to obtain the exact amount paid for butterfat churned during the twelve months covered by the operating statement. The expense paid by the creamery for hauling cream is added to the amount paid for butterfat in order to obtain the total cost of butterfat purchased. There is considerable difference among creameries as to cream hauling expense, but in any case it must be taken into account in finding the actual cost of the butterfat delivered at the creamery.

The total cost of raw materials is added to the cost of creamery labor which includes the wages paid to the buttermaker and his helpers

⁵ See page 25 and Appendix C.

for their work in the creamery. The creameries included in this study had one main enterprise, namely, that of making butter. This meant that no extra labor was employed to help with sidelines such as cheese, whole milk, and sweet cream sales, or poultry and egg departments. All labor that was hired was employed for the buttermaking operation. Nothing extra was paid the men in case they sold some cheese or sweet cream to patrons. In such cases all creamery labor should be charged to the making of butter. However, in many creameries not included in this particular study, extra help is hired because the creamery has some large sideline enterprise.⁶ Where this is the case, the wages paid this help should be prorated as accurately as possible to the individual enterprises for which the work is done. It obviously would be unfair to charge the buttermaking enterprise with the full wages of a helper who spends much of his time working in the egg and poultry or some other department.⁷

The last group of expenses is classified as manufacturing expense and includes the various items that enter into the cost of processing. This is an important group of costs and will be dealt with in detail. There is a great variety of such expenses, but the example given in Schedule 5 should serve to illustrate some of the expenses most commonly found.

The first list includes heat, light, power, and possibly water and ice used in the manufacture of butter. Next is listed factory supplies, such as salt, coloring, acid, cleansing materials, starter, test tubes, packages, and wrappers. Repairs consist of actual expenditures for both repair materials and special labor hired to make repairs to the manufacturing plant, including building and machinery.

Depreciation is an important item of expense which all creameries have, altho some fail to take it into account in computing their costs. Depreciation during a given period of time is the decrease in value of a fixed asset due to wear and tear, lapse of time, and obsolescence. In creameries, depreciation is commonly the loss of service value of tools, machines, and buildings due to wear and tear in the process of production. Assume that a creamery buys a \$1,000 churn, which is expected to last ten years and then be worthless. Obviously the cost of the machine makes up some of the cost of the butter which it churns, and therefore a certain part of the original cost of the churn should be charged to manufacturing expense during each year of life of the machine. Some creameries follow the practice of making a flat 10 per cent depreciation charge on all machinery and equipment. If this plan is used in the preceding example, the annual depreciation expense would be \$100.

⁶ Appendix C shows schedules suitable for creameries having large sideline enterprises.

⁷ Schedule 14, Appendix C.

The next expense listed is insurance, which refers particularly to fire, theft, and workmen's compensation insurance. The premium paid for fire insurance usually should be charged as a manufacturing expense, since the particular property insured, as buildings and equipment, is erected and installed primarily for the manufacture of butter. In case these items are used for some other enterprise, a certain proportion of the total cost of insurance should be charged to such sideline enterprise.

Taxes are commonly paid on the building and equipment which are built and used for the purpose of making butter, and therefore such taxes constitute a part of the manufacturing expense. Where special equipment or building space is provided as an office for some rather important sideline, taxes should be prorated to the general and administrative expense or to these sideline enterprises in order that a fair basis may be established on which to judge the relative incomes of the enterprises. Certain creameries pay much higher taxes for a small plant than others do for a large one, but this difference must be considered in the cost of making butter and means only that creameries located where the tax rate is low may have some advantage over creameries located where the rate is high.

Dues for membership in a central organization may be classified as manufacturing, selling, or general and administrative expenses. For creameries, the classification as manufacturing expense seems most logical because the dues paid cover salaries of fieldmen whose work primarily is to help increase the quality and quantity of butter made by the creamery. In this connection it is well to realize that for comparability it is necessary that all creameries follow one method of classification of these items. Expenses of creameries that pay no dues are more comparable with expenses of creameries that do, if dues are considered a manufacturing expense than if they are considered in some other way.

In addition to the specific headings given as examples of manufacturing expenses, there may be others in the case of individual creameries. These may be listed separately, or if they are of minor importance they may be listed as miscellaneous manufacturing expenses. The classification will depend on the particular conditions in the individual creamery.

The part of the statement so far discussed has shown the difference between sales of dairy products and the cost of dairy products sold, or the gross earnings from sales of dairy products.⁸ Schedule 6, page 23, shows some of the selling expenses. It is important for the analysis of a business that the costs of selling be kept separately in

⁸ See B, Schedule 11, p. 27.

order that the manager, board of directors, and patrons may determine more definitely why the price paid for their butterfat may differ from the price paid in other creameries. Confusion and dissatisfaction frequently result from attempts to compare different creameries as to prices paid for butterfat and prices received for butter. Unless similar accounting practices are followed, worthwhile comparisons are impossible.

**Schedule 6.—Selling Expense of The X Cooperative Creamery Association
for the Year Ending December 31, 193—**

Freight on Dairy Products Shipped.....	\$
Handling Charges	\$
Local Hauling to Railroad.....	\$
Advertising	\$
Miscellaneous Selling Expenses.....	\$
Total Selling Expenses.....	\$

For instance, if one creamery reports gross return per pound of butter and another the net return after freight, commissions, and local hauling costs have been deducted the comparison is unfair and misleading. If a comparison of price paid for butterfat is made between one creamery which charges depreciation as a manufacturing expense and establishes a fund with which to replace the plant and equipment when they are worn out, and another creamery which does not charge depreciation as a cost, the latter creamery may appear to have an advantage which it really does not possess, since the patrons will eventually be paid less for butterfat in order to pay for the new plant and equipment when the old finally have to be replaced. Selling expense in one creamery may be unavoidably higher than in another, or it may be of a nature such that it could be reduced materially by some change in the method of sale. The first selling expense listed is freight on dairy products shipped. This varies with distance from market, with volume per shipment, and with method of shipment used. Occasionally individual creameries are able to obtain certain transportation advantages such as those given by through shipment rates. Handling charges include deductions made by overhead sales organizations, brokers, or commission men, together with hauling costs at the receiving end.

The cost of getting the butter to the railroad varies considerably for different creameries, but in every case it is a part of the selling expense. Some inland creameries have a rather serious disadvantage in this respect. Other creameries are located in villages where the competition for the butter-hauling contract may be so severe that unusually favorable rates are obtained. Such creameries have an advantage over others forced to pay a higher price to have their butter hauled to the railroad. The last item classified as a selling cost is that of advertising. In some cases the money so spent is really in the form of a donation; but after all, even in this extreme form, its purpose often is to main-

tain and to build good will among customers and prospective customers with the ultimate aim of at least maintaining dairy products sales. Advertising may help to find new markets for the products and certainly belongs in the group of costs concerned with selling.

The sum of these selling costs and any others which individual creameries might have is subtracted from the gross income from sale of dairy products (line 4, Schedule 3) and the remainder is the net income from sales of dairy products (line 7).⁹

General administrative expenses, illustrated in Schedule 7, include those connected with the office work as well as other items which cannot be charged to definite departments of the creamery, but must be borne by the business as a whole. In large creameries there may be a special office force, but in small creameries the buttermaker may have to do both the creamery and the office work. In other cases some member of the board of directors, such as the secretary, may do the office work for a yearly fee. Where the buttermaker does the work himself, he should charge his time to office salary on a basis of the part of his time he expends on the office work. For instance, if he uses one-tenth of his time for office work and receives \$200 a month, then \$20 would be charged to office salaries and \$180 to creamery labor. Salaries paid to officers for their services are prorated in similar manner.¹⁰

Schedule 7.—General Administrative Expenses of The X Cooperative Creamery Association for the Year Ending December 31, 193—

Office Salaries	\$
Officers' Salaries and Directors' Fees	\$
Office Supplies	\$
Telephone and Telegraph	\$
Auditing and Legal	\$
Depreciation—Office Equipment	\$
Bad Debts	\$
Miscellaneous General Expense	\$
Total General and Administrative Expense	\$

The other items listed in this schedule, such as office supplies, telephone and telegraph, auditing and legal, and depreciation on office equipment, are obviously either expenses connected with the office or with the business as a whole and cannot be definitely charged to individual departments. They, therefore, make up general and administrative expenses.

Bad debts are another expense of controversial nature. Some authorities contend that bad debts are selling costs, others believe that they are a financial expense commonly called "other deductions," while still others maintain that bad debts are a general administrative expense. It is possible that each of the three classifications may, under certain conditions, be the correct one to use because of variations among

⁹ See C, Schedule 11, p. 27.

¹⁰ Schedule 16, Appendix C.

different kinds of businesses. Bad debt losses should be attributed to the department which supervises credits. In most instances in creameries this will mean that bad debts are a general and administrative expense.

When the total general and administrative expense (line 9, Schedule 3, page 18) is subtracted from the net income on sales of dairy products (line 7), the remainder represents the net earnings or loss from the operations of the business, or the net operating income, line 10.¹¹

**Schedule 8.—Other Income of The X Cooperative Creamery Association
for the Year Ending December 31, 193—**

Interest Income	\$
Purchase Discounts	\$
Sideline Income (See Schedule 9).....	\$
Total Other Income	\$

The summary of non-operating income, commonly known as other income is shown by Schedule 8. Such sources of income differ considerably among the various creameries. Some creameries have large sideline departments such as buttermilk, sweet cream and whole milk, cheese, egg and poultry, feed, machinery, automobile supplies, and insurance.¹² Other creameries have no, or at least very small, sidelines. Where the sidelines are large, necessitating special equipment and extra building space and labor, separate records should be kept for each of these enterprises in a manner similar to that used for the buttermaking enterprise. This means that when these other enterprises are large, separate income and expense statements should be kept for each of them as is done for the buttermaking enterprise in creameries where the latter is the only source of operating income. The net income from these important enterprises would be a part of operating income similar to the income from the butter enterprise. In cases where these sidelines are small, require no extra help, and aim to utilize more completely the plant and labor without much increase in expense, any income from them will be classed as non-operating or other income, and will appear in such a schedule as is here discussed.¹³ Other income not only contains items of income from the minor sidelines, but it also includes interest and purchase discounts. Interest is the amount earned on investments of various sorts outside the business itself. Purchase discounts are refunds received from some overhead buying organization through which purchases have been made. These combined incomes constitute the income from sources other than the main one of the business, which in this case is making butter.

¹¹ See D, Schedule 11, p. 27.
¹² Schedules 13-18, Appendix C.
¹³ Schedule 9.

Schedule 11.—Income and Expense Statement of the X Cooperative Creamery Association for the Year Ending December 31, 193—

Sales of Dairy Products			
Butter			
Shipped	\$		
Local	\$		
Patron	\$		
Total Sales of Butter			\$
Cream			
Shipped	\$		
Local	\$		
Total Sales of Cream			\$
Milk			\$
Buttermilk			\$
A. Total Sales of Dairy Products			\$
Less:			
Cost of Dairy Products Sold			
Inventory of Dairy Products—January 1, 193—		\$	
Add:			
Cost of Dairy Products Manufactured			
Raw Material			
Inventory of Butterfat—			
January 1, 193—	\$		
Butterfat Purchases	\$		
Hauling Butterfat	\$		
Total	\$		
Less:			
Inventory of Butterfat—			
December 31, 193—	\$		
Total Raw Material		\$	
Labor			
Manufacturing Expenses			
Heat, Light, Power, Water and Refrigeration	\$		
Factory Supplies, Packages and Wrappers	\$		
Repairs	\$		
Depreciation—Buildings	\$		
Depreciation—Machinery and Equipment	\$		
Insurance	\$		
Taxes	\$		
Dues	\$		
Miscellaneous Manufacturing Expenses	\$		
Total Manufacturing Expenses		\$	
Total Cost of Dairy Products Manufactured		\$	
Total		\$	
Less:			
Inventory of Dairy Products—December 31, 193—		\$	
Total Cost of Dairy Products Sold			\$
B. Gross Income from Sales of Dairy Products			\$
Less:			
Selling Expenses			
Freight on Dairy Products Shipped	\$		
Handling Charges	\$		
Local Hauling to Railroad	\$		
Advertising	\$		
Miscellaneous Selling Expenses	\$		
Total Selling Expenses			\$
C. Net Income from Sales of Dairy Products			\$
Less:			
General—Administrative Expenses			
Office Salaries	\$		
Officers' Salaries and Directors' Fees	\$		
Office Supplies	\$		
Telephone and Telegraph	\$		
Auditing and Legal	\$		
Depreciation—Office Equipment	\$		
Bad Debts	\$		
Miscellaneous General Expenses	\$		
Total General and Administrative Expenses			\$
D. Net Operating Income			\$
Add:			
Other Income			
Interest Income	\$		
Purchase Discounts	\$		
Income from Sidelines (Schedule 9)	\$		
Total Other Income			\$
E. Total			\$
Less:			
Other Deductions			
Interest on Loans	\$		
Loss from Sidelines	\$		
Total Other Deductions			\$
F. Net Earning for the Year			\$

Methods of Analysis

In making an analysis of an operating statement, it is helpful if the various figures in the statement are reduced to some common basis to facilitate comparison and comprehension. For example, if in a creamery making 500,000 pounds of butter, \$5,000 was spent for creamery labor and the butter sales amounted to \$150,000, it might be better to say that creamery labor cost $3\frac{1}{3}$ cents per dollar of butter sales, or that creamery labor cost 1 cent per pound of butter made, than to say merely that creamery labor cost \$5,000. Cost per pound of butter made is used in this analysis, altho costs per pound of butterfat purchased are given in Appendix B for the use of those readers who think in terms of pounds of butterfat.

Table 6.—Average Cost of Dairy Products Sold by 117 Minnesota Cooperative Creamery Associations Classified According to Pounds of Butter Made During the Year Ending December 31, 1931

	Average All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
No. of Creameries.....	117	6	48	34	16	6	7
Cost of Dairy Products Sold:							
Inventory of Dairy Products—Jan. 1, 1931	\$ 294.00	\$ 38.00	\$ 145.03	\$ 285.30	\$ 252.43	\$ 784.31	\$ 1,251.90
Add:							
Cost of Dairy Products Manufactured:							
Cost of Raw Material:							
Butterfat	69,333.31	22,922.12	41,873.36	66,793.78	95,121.01	130,155.05	198,669.51
Hauling Cream ..	430.14	None	176.00	494.15	769.25	143.41	1,701.33
Total Cost of Raw Material	\$69,763.45	\$22,922.12	\$42,049.36	\$67,287.93	\$95,890.26	\$130,298.46	\$200,370.84
Creamery Labor	3,360.39	1,823.68	2,480.50	3,421.91	4,145.35	5,338.85	6,922.25
Manufacturing Expense	5,719.70	2,454.66	4,108.73	5,961.98	7,647.02	8,556.51	11,551.40
Total Cost of Dairy Products Manufactured	\$78,843.54	\$27,200.46	\$48,638.59	\$76,671.82	\$107,682.63	\$144,193.82	\$218,844.49
Inventory of Dairy Products—Jan. 1, 1931							
Plus Cost of Dairy Products Manufactured	79,137.54	27,238.46	48,783.62	76,957.12	107,935.06	144,978.13	220,096.39
Less:							
Inventory of Dairy Products—Dec. 1, 1931...	247.76	89.57	156.52	213.18	163.73	878.07	828.76
Total Cost of Dairy Products Sold.....	\$78,889.78	\$27,148.89	\$48,627.10	\$76,743.94	\$107,771.33	\$144,100.06	\$219,267.63

Analysis of the Income and Expense Statements¹⁶ of 117 Creameries

Tables 6, 7, 8, and 9 indicate that there is a tendency for total costs to increase as volume of butter becomes larger. This is true of sales and cost of dairy products sold. However, the question to be answered is, have the various expenses per pound of butter made increased in

¹⁶ The statements of these 117 creameries are analyzed in accordance with the methods of procedure already discussed in all instances where the available data make such analysis possible. In some cases, other classifications and methods of procedure are necessary because of the manner in which the data were reported by the creameries; for instance, the method of handling selling expenses.

Table 7.—Average Manufacturing Expense of 117 Minnesota Cooperative Creamery Associations Classified According to Pounds of Butter Made During the Year Ending December 31, 1931

	Average All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
No. of Creameries.....	117	6	48	34	16	6	7
Manufacturing Expense:							
Fuel, Heat, Light, Power, Refrigeration, Ice and Water	\$1,058.42	\$ 597.77	\$ 844.44	\$1,127.81	\$1,324.91	\$1,339.63	\$ 1,733.40
Supplies	2,748.15	1,019.52	1,806.93	2,833.30	3,799.79	4,546.39	6,325.23
Freight, Express and Drayage	286.13	134.84	244.24	215.29	368.57	342.97	809.90
Taxes	286.08	72.11	213.04	325.49	389.00	413.76	434.22
Insurance	165.42	145.70	130.17	183.06	197.80	241.47	230.69
Repairs	219.11	108.84	122.93	201.09	385.90	305.12	574.18
Depreciation	936.25	375.88	732.01	1,056.31	1,161.61	1,299.33	1,407.65
Miscellaneous	20.14	None	14.96	19.63	19.44	67.84	36.13
Total Manufacturing Expense	\$5,719.70	\$2,454.66	\$4,108.72	\$5,961.98	\$7,647.02	\$8,556.51	\$11,551.40

Table 8.—Average General and Administrative Expense of 117 Minnesota Cooperative Creamery Associations Classified According to Pounds of Butter Made During the Year Ending December 31, 1931

	Average All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
No. of Creameries.....	117	6	48	34	16	6	7
General Administrative Expense:							
General Salaries....	\$ 639.53	\$ 214.50	\$ 471.72	\$ 697.16	\$ 847.32	\$ 923.58	\$1,156.21
Office Expense.....	192.42	34.42	116.51	247.97	238.94	212.00	455.46
Audit and Legal	54.93	15.61	55.53	69.63	42.14	61.65	36.68
Bad Debts	10.06	None	12.63	12.98	None	21.50	None
Miscellaneous	119.20	46.07	92.84	136.81	151.77	190.08	141.84
Total General and Administrative Expense.....	\$1,016.14	\$ 310.60	\$ 749.23	\$1,164.55	\$1,280.17	\$1,408.81	\$1,790.19

Table 9.—Condensed Operating Statement Showing the Average Result of the Year's Operations by 117 Minnesota Cooperative Creamery Associations Classified According to Pounds of Butter Made During the Year Ending December 31, 1931

	Average All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
No. of Creameries	117	6	48	34	16	6	7
Sales of Dairy Products	\$80,220.08	\$27,055.34	\$49,410.12	\$78,468.30	\$109,592.85	\$145,828.68	\$222,192.95
Cost of Dairy Products Sold	78,889.78	27,148.89	48,627.10	76,743.95	107,771.32	144,100.06	219,267.63
Gross Income or (Loss)	1,330.30	-93.55	783.02	1,724.35	1,821.53	1,728.62	2,925.32
General and Adminis- trative Expense..	1,016.14	310.60	749.23	1,164.55	1,280.17	1,408.81	1,790.19
Operating Income or (Loss)	314.16	-404.15	33.79	559.80	541.36	319.81	1,135.13
Other Income	484.10	340.69	407.05	568.25	580.97	427.89	553.29
Total	798.26	-63.46	440.84	1,128.05	1,122.33	747.70	1,688.42
Other Deductions...	376.62	120.00	296.27	489.14	449.04	330.76	474.69
Net Earnings or (Loss)	421.64	-183.46	144.57	638.91	673.29	416.94	1,213.73

amount, and not, have the total expenses increased. Tables 10, 11, 12, and 13 show the various classes of expenses for the different groups of creameries on the basis of average cost per pound of butter made. Table 13 presents the condensed operating statement, expressed in cents per pound of butter, for the 117 creameries for the year 1931.

Table 10.—Average Cost of Dairy Products Sold Expressed in Cents Per Pound of Butter Made by 117 Minnesota Cooperative Creamery Associations Classified According to Pounds of Butter Made During the Year Ending December 31, 1931

	Average						
	All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
No. of Creameries.....	117	6	48	34	16	6	7
Cost of Dairy Products Sold:							
Inventory of Dairy Products—Jan. 1, 1931.....	0.09¢	0.04¢	0.07¢	0.10¢	0.06¢	0.14¢	0.15¢
Add:							
Cost of Dairy Products Manufactured:							
Cost of Raw Material							
Butterfat*	22.65	21.96	21.99	22.12	22.81	24.00	23.77
Hauling Cream	0.14	None	0.09	0.16	0.18	0.03	0.20
Total Cost of Raw Material	22.79¢	21.96¢	22.08¢	22.28¢	22.99¢	24.03¢	23.97¢
Creamery Labor	1.10	1.75	1.30	1.13	1.00	0.98	0.83
Manufacturing Expense	1.87	2.35	2.16	1.97	1.83	1.58	1.38
Total Cost of Dairy Products Manufactured	25.76¢	26.06¢	25.54¢	25.38¢	25.82¢	26.59¢	26.18¢
Inventory of Dairy Products—Jan. 1, 1931							
Plus Cost of Dairy Products Manufactured	25.85	26.10	25.61	25.48	25.88	26.73	26.33
Less:							
Inventory of Dairy Products—Dec. 31, 1931	0.08	0.09	0.08	0.07	0.04	0.16	0.10
Total Cost of Dairy Products Sold	25.77¢	26.01¢	25.53¢	25.41¢	25.84¢	26.57¢	26.23¢
* This cost of raw material is the amount paid for butterfat per pound of butter made, and is not the actual average price paid patrons for their butterfat. The average prices per pound which patrons did receive for their butterfat are given below:							
Average price paid per pound of butterfat	27.83	27.03	27.15	27.20	27.72	29.60	29.24

A detailed analysis of the average cost of dairy products sold expressed in cents per pound of butter made is given in Table 10. The inventories increased in amount from 0.04 cents for the small creameries to 0.15 cents for the largest creameries. The cost of butterfat per pound of butter made varied from 21.96 cents in case of the small creameries to an average of 24.00 cents for the group handling between 500,000 and 625,000 pounds of butter. The last line (Table 10) also shows the average price paid per pound of butterfat, which varied from 27.03 cents for the small creameries to an average of 29.60 cents for the Group V creameries. This is a difference of more than 2½ cents per pound of butterfat in favor of the patrons of larger creameries.

The cost of cream hauling is of importance in some creameries and of no importance in others, and is not necessarily related to the volume of butter made. The amount paid for hauling depends on the par-

ticular hauling plan used, the choice of which is influenced by custom, competition, demands of patrons, or a combination of these three. Conditions in the individual creameries differ much, but in all cases the board of directors attempts to adopt the most economical and satisfactory way of getting cream to the plant. Under any given conditions, the more paid for cream hauling, the less can be paid patrons for butterfat. Hauling costs varied from nothing to as high as one-fifth of a cent per pound of butter, and the amount paid apparently bore some relation to the volume of butter made, the largest volume group having the highest cost, and the smallest volume group having none.

Creamery labor is an important expense which would be expected to vary with the volume of the creamery. Table 10 indicates that the cost of creamery labor per pound of butter decreased consistently as the volume increased. The small creameries averaged 1.75 cents and the large creameries averaged 0.83 cents per pound of butter.¹⁷ From these data it appears that the larger creameries paid less for creamery labor per pound of butter than did the small-volume creameries, and evidently employed labor more efficiently than did the smaller creameries.

Manufacturing expense may be examined in more detail in Table 11. In the small-volume creameries the manufacturing expense averaged 2.35 cents per pound of butter, while in the large-volume creameries it was 1.38 cents, a difference of 0.97 cents per pound. The small-volume creameries used the difference to pay their manufacturing expenses. The large-volume creameries paid the difference to their patrons, who, as a result, received approximately \$10,000 more than they would have received at the price paid by the small creameries. In general, the various expenses per pound of butter decreased as the volume increased. This is particularly true of heat, light, and power, for which the cost was 0.57 cents per pound in the small-volume group, and 0.21 cents per pound in the large-volume group. The largest single item of manufacturing expense was that of supplies. Like the first group of expenses, cost of supplies per pound of butter decreased consistently as the volume of the creamery increased. For the smaller creameries in this study it averaged 0.98 cents, and the amount gradually declined until it was 0.75 cents per pound for the largest creameries. Some other items in this table, such as freight, express, and drayage; taxes; repairs; and miscellaneous expenses, may vary widely from year to year and may be influenced by so many factors entirely independent of the volume of butter made that there need be no relation between these

¹⁷ Table 25 of Appendix B shows that the difference in labor expense accounted for 1.13 cents of the difference paid patrons for butterfat.

expenses and the volume of the creamery. However, volume is so important that even in the case of these four items their sum was 0.34 cents per pound for the small creameries and only 0.22 cents per pound for the large creameries.

Table 11.—Average Manufacturing Expense Expressed in Cents Per Pound of Butter Made by 117 Minnesota Cooperative Creamery Associations Classified According to Pounds of Butter Made During the Year Ending December 31, 1931

No. of Creameries.....	Average						
	All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
Manufacturing Expense:							
Fuel, Heat, Light, Power, Refrigeration, Ice and Water	0.35¢	0.57¢	0.44¢	0.37¢	0.32¢	0.25¢	0.21¢
Supplies .....	.90	.98	.95	.94	.91	.84	.75
Freight Express and Dray- age .....	.09	.13	.13	.07	.09	.06	.10
Taxes .....	.09	.07	.11	.11	.09	.08	.05
Insurance .....	.05	.10	.07	.06	.05	.04	.03
Repairs .....	.07	.14	.07	.06	.09	.06	.07
Depreciation .....	.31	.36	.38	.35	.28	.24	.17
Miscellaneous .....	.01	None	.01	.01	.00	.01	.00
Total Manufacturing Ex- pense	1.87¢	2.35¢	2.16¢	1.97¢	1.83¢	1.58¢	1.38¢

The total insurance and depreciation expenses should be larger in very large creameries than in very small ones. But when these expenses are reduced to a cost-per-pound basis, insurance decreased from 0.10 cents per pound in the small creameries to 0.03 cents per pound in the largest creameries, and depreciation decreased from 0.36 cents in the small creameries to 0.17 cents in the large-volume plants. When these manufacturing expenses were combined, it was inevitable that the manufacturing expense per pound of butter made was more in the small than in the large creameries.

The next major class of expenses, general and administrative, is shown in Table 12. The lowest general and administrative expenses per pound of butter made were associated with the two creamery groups of large volume. The one important item which constituted more than 60 per cent of general and administrative expense was general salaries. In only two groups of creameries was the general salaries expense distinctly less than the average of all the creameries, and those groups were V and VI, making over 500,000 pounds of butter. The other items were of minor importance, relatively, and varied more because of particular conditions of the creamery than because of volume of butter made. However, the smallest total of all the remaining items in Table 12 was for Group VI. These data indicate that general and administrative expenses per pound of butter made tend to be lower for large-volume creameries than for small-volume ones.

Table 12.—Average General and Administrative Expense Expressed in Cents Per Pound of Butter Made by 117 Minnesota Cooperative Creamery Associations Classified According to Pounds of Butter Made During the Year Ending December 31, 1931

	Average All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
No. of Creameries.....	117	6	48	34	16	6	7
General and Administrative Expense:							
General Salaries	0.21¢	0.21¢	0.25¢	0.23¢	0.20¢	0.17¢	0.14¢
Office Expense .....	.06	.03	.06	.08	.06	.04	.05
Audit and Legal .....	.02	.02	.03	.02	.01	.01	.00
Bad Debts .....	.00	None	.00	.00	None	.00	None
Miscellaneous .....	.04	.04	.05	.05	.04	.04	.02
Total General and Administrative Expense	0.33¢	0.30¢	0.39¢	0.38¢	0.31¢	0.26¢	0.21¢

Table 13 includes two other major items, namely, other income and other deductions. The type of creameries selected for this study makes other income of minor importance, since only creameries with practically no sidelines were included in the study. Other deductions is an example of another item that need bear no relation to volume of butter made, but depends, rather, on the particular set-up of the individual creamery.

Table 13.—Condensed Operating Statement Expressed in Cents Per Pound of Butter Made, Showing the Average Result of the Year's Operations by 117 Minnesota Cooperative Creamery Associations Classified According to Pounds of Butter Made During the Year Ending December 31, 1931

	Average All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
No. of Creameries.....	117	6	48	34	16	6	7
Sales of Dairy Products.....	26.20¢	25.92¢	25.94¢	25.98¢	26.28¢	26.89¢	26.58¢
Cost of Dairy Products Sold..	25.77	26.01	25.53	25.41	25.84	26.57	26.23
Gross Income or (Loss).. General and Administrative Expense.....	0.43 .33	-0.09 .30	0.41 .39	0.57 .38	0.44 .31	0.32 .26	0.35 .21
Operating Income or (Loss) Other Income .....	.10 .16	-.39 .33	.02 .21	.19 .18	.13 .14	.06 .08	.14 .06
Total .....	.26	-.06	.23	.37	.27	.14	.20
Other Deductions .....	.12	.11	.15	.16	.11	.06	.06
Net earnings or (Loss).. Other Deductions .....	.14¢ .12	-.17¢ .11	.08¢ .15	.21¢ .16	.16¢ .11	.08¢ .06	.14¢ .06

The last item of both Tables 9 and 13 is net earnings or loss. In the case of cooperatives this term is not so important as in other types of business, but in all types net earnings are a source of business surplus, which is needed to safeguard an enterprise during times of poor business conditions. In the case of cooperative creameries the net earning is the amount available for a surplus reserve, for interest on capital stock, or for higher butterfat payments in the form of a patronage divi-

dend, while a net loss is the total amount which the patrons have been overpaid for their butterfat.

The small-volume group was the only one showing an average net loss (Table 9). All the other groups showed some net earnings, but the greatest average earnings were obtained by the creameries in the group making more than 625,000 pounds of butter.

Table 14 shows the average price per pound that each group of creameries could have paid for butterfat if it had maintained its surplus but had used all its net earnings for butterfat payments to its patrons.

Table 14.—Average Net Earnings Made and Average Prices Paid Per Pound of Butterfat by 117 Minnesota Cooperative Creamery Associations During the Year Ending December 31, 1931

	Average All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
No. of Creameries.....	117	6	48	34	16	6	7
Net earnings or <i>loss</i> per pound of butterfat*	0.17¢	-0.22¢	0.09¢	0.26¢	0.20¢	0.09¢	0.18¢
Price paid per pound of butterfat†.....	27.83	27.03	27.15	27.20	27.72	29.60	29.24
Total price that could have been paid for butterfat....	28.00¢	26.81¢	27.24¢	27.46¢	27.92¢	29.69¢	29.42¢

* Table 15, Appendix A.

† Table 16, Appendix A.

The average for all creameries was 28 cents, and only the two large-volume groups could have paid more than this price. There was a difference of 2.61 cents between the low of 26.81 cents payable by the smallest-volume group and the 29.42 cents payable by the group making over 625,000 pounds of butter.

The analysis of the operating statements of these 117 creameries indicates that volume of butter made is a very important factor in determining the success of creameries. Large-volume creameries have some advantage of lower creamery labor, manufacturing, and general and administrative expenses. Partly as a result of these lower unit costs, it was possible for the larger creameries in this study to pay their patrons approximately two cents more for each pound of butterfat than the small creameries could pay (Table 14). Moreover, volume is an important influence on other factors which affect the price a creamery can pay for butterfat. For instance, volume may affect the percentage of overrun, because mechanical losses are a larger part of a small churning than of a large churning. This tends to cause the overrun of small creameries to be lower than that of equally efficient large creameries. Furthermore, sales methods may be influenced by volume. Creameries having a large volume of uniform quality butter may develop special outlets which they would neither be able to acquire nor supply if their volume were less.

Quality of butterfat and butter need bear no relationship to volume of butter made. Nevertheless, creameries located in dairy communities frequently have a large volume of butterfat from farms specializing in dairying and attempting to produce high-quality butterfat. In such localities butterfat is often handled better and is more effectively graded. Small-volume creameries may be located in regions where butterfat production is a sideline to the main farm business, and in such localities cream may be of inferior quality. In addition, small volume may necessitate infrequent churning, which may further lower the quality. Mixture of low- and high-quality butterfat may be necessary in order to churn economically. High-quality butter requires high-quality butterfat. Some of the highest-scoring butter is made by some small-volume creameries. Nevertheless, large-volume creameries may have some advantages over small creameries in obtaining larger amounts of high-quality butterfat and equipment and creamery labor which are better adapted to produce high-quality butter.

It may be possible for a creamery to increase its volume in several ways. It may get more butterfat from the same patrons. This can be done by getting larger output per cow, by herd improvement, or by an increase in the number of cows in the patrons' herds. Or it may be accomplished by increasing the number of patrons. This can be done by drawing patrons from other creameries or cream stations, or by consolidating with another creamery. Replacement of plant may be less economical than consolidation with another creamery when building and equipment are partially or entirely worn out.

From the viewpoint of the patron member, the success of a cooperative creamery is judged largely by the price paid for butterfat. This study indicates that the volume of butter made is a major factor in determining the price a creamery can pay for butterfat.

Statistical Memoranda

The statistical statement (Schedule 12, page 36) is the third main part of an annual creamery report. The financial condition of a business has been pictured by the information contained in the balance sheet and in the income and expense statement. The statistical statement provides data concerning the physical volume of butterfat and butter handled and includes such information as the number of pounds of the different classes of butterfat purchased, the average tests of grades of cream, the pounds of butterfat sold as milk and cream, and the pounds of butter made. The difference between the pounds of butter manufactured and the pounds of butterfat churned is the number of pounds of overrun. This figure multiplied by 100 and then divided by the number of pounds of butterfat churned is the percentage of overrun for the creamery.

Schedule 12.—Statistical Memoranda*

1. Average Number of Patrons.....					
MILK AND CREAM RECEIVED					
	Volume	Average test	Butterfat	Value	Value per lb.
2. First Grade Cream.....	_____lb.	_____%	_____lb.	\$ _____	_____¢
3. Second Grade Cream.....	_____lb.	_____%	_____lb.	\$ _____	_____¢
4. Ungraded Cream.....	_____lb.	_____%	_____lb.	\$ _____	_____¢
5. Total Cream.....	_____lb.	_____%	_____lb.	\$ _____	_____¢
6. Milk.....	_____lb.	_____%	_____lb.	\$ _____	_____¢
7. Total.....	_____lb.	_____%	_____lb.	\$ _____	_____¢
BUTTERFAT AND DAIRY PRODUCTS					
	Volume	Value	Value per lb.		
8. Total Butterfat Purchased.....	_____lb.	\$ _____	_____¢		
9. Less Butterfat Sold in Milk and Cream....	_____lb.	\$ _____	_____¢		
10. Total Butterfat Churned.....	_____lb.	\$ _____	_____¢		
11. Butter Shipped.....	_____lb.	\$ _____	_____¢		
12. Butter Sold Local.....	_____lb.	\$ _____	_____¢		
13. Butter Sold Patrons.....	_____lb.	\$ _____	_____¢		
14. Total Butter Sold.....	_____lb.	\$ _____	_____¢		
15. Add Butter in Closing Inventory.....	_____lb.	\$ _____	_____¢		
16. Total Butter to Account for.....	_____lb.	\$ _____	_____¢		
17. Less Butter in Beginning Inventory.....	_____lb.	\$ _____	_____¢		
18. Total Butter Manufactured.....	_____lb.	\$ _____	_____¢		
19. Skimmilk Powder Manufactured.....	_____lb.	\$ _____	_____¢		
20. Sweet Cream Buttermilk Powder.....	_____lb.	\$ _____	_____¢		
21. Sour Cream Buttermilk Powder.....	_____lb.	\$ _____	_____¢		
22. Condensed Milk.....	_____lb.	\$ _____	_____¢		
23. Condensed Skimmed Milk.....	_____lb.	\$ _____	_____¢		
24. Casein.....	_____lb.	\$ _____	_____¢		
25. Cottage Cheese.....	_____lb.	\$ _____	_____¢		
26. Cultured Buttermilk.....	_____lb.	\$ _____	_____¢		
27. Ice Cream.....	_____lb.	\$ _____	_____¢		
28. Salted Butter.....	_____lb.	\$ _____	_____¢		
29. Unsalted Butter.....	_____lb.	\$ _____	_____¢		
30. Total Butter.....	_____lb.	\$ _____	_____¢		
COMPUTATION OF OVERRUN					
31. Butter Manufactured (Line 18).....					_____lb.
32. Butterfat Churned (Line 10).....					_____lb.
33. Overrun.....					_____lb.
34. Pounds Overrun (Line 33) × 100					_____%
	Pounds Butterfat Churned (Line 10)				
EXPENSES PER POUND OF BUTTER MANUFACTURED					
35. Manufacturing Expense per pound of Butter Manufactured.....					_____¢
36. General Expense per pound of Butterfat Manufactured.....					_____¢
37. Total Manufacturing and General Expense per pound of Butter Manufactured.....					_____¢

* Creameries whose sole business is to make butter will have no use for lines 19 to 27, inclusive.

Throughout this analysis use has been made of these statistical data from the creameries in this study. Attempts to study problems encountered by Minnesota creameries emphasize the inadequacy of the records kept by a large number of creameries. Nevertheless, these reports have served to inform creamery patrons of the receipts, expenditures, and general progress of their creamery business. The more complete and uniform the annual reports are, the more valuable services

they will render. Different creamery businesses can be more easily compared, profitable methods of creamery operation can be more uniformly adopted, and an increase in the price paid patrons for butterfat should result. Misunderstandings that exist among creameries may be removed if a uniform creamery accounting system is adopted, and this would tend to develop a greater spirit of cooperation among the creameries themselves.

APPENDIX A

The tables in Appendix A show the Condensed Operating Statement (Table 15) and the Cost of Dairy Products Sold (Table 16) for the 117 creameries classified as before; that is, on the basis of pounds of butter made.

However, the items in each of these two tables are expressed in cents per pound of butterfat handled rather than in cents per pound of butter made, as was done in previous tables, such as 10 and 13. Since there are fewer pounds of butterfat than of butter, due to overrun, the items are larger when expressed per pound of butterfat than when expressed per pound of butter made. The cost per pound of butterfat shown in Table 16 is the average price paid patrons per pound of butterfat by each group of creameries. Table 15 shows the net earnings or loss per pound of butterfat handled, for each creamery group.

Table 15.—Condensed Operating Statement Expressed in Cents Per Pound of Butterfat Handled, Showing the Average Result of the Year's Operations by 117 Minnesota Cooperative Creamery Associations Classified According to Pounds of Butter Made During the Year Ending December 31, 1931

	Average All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
No. of Creameries.....	117	6	48	34	16	6	7
Sales of Dairy Products.....	32.20¢	31.90¢	32.04¢	31.95¢	31.94¢	33.16¢	32.71¢
Cost of Dairy Products Sold	31.67	32.01	31.53	31.25	31.41	32.77	32.28
Gross Income or (Loss).. General and Administrative Expense .....	.53	-.11	.51	.70	.53	.39	.43
Operating Income or (Loss) Other Income .....	.12	-.48	.02	.23	.16	.07	.17
Total .....	.32	-.08	.28	.46	.33	.17	.25
Other Deductions .....	.15	.14	.19	.20	.13	.08	.07
Net Earnings or (Loss).. .....	.17¢	-.22¢	.09¢	.26¢	.20¢	.09¢	.18¢

Table 16.—Average Cost of Dairy Products Sold Expressed in Cents Per Pound of Butterfat Handled by 117 Minnesota Cooperative Creamery Associations Classified According to Pounds of Butter Made. During the Year Ending December 31, 1931

	Average						
	All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
No. of Creameries.....	117	6	48	34	16	6	7
Cost of Dairy Products Sold:							
Inventory of Dairy Products—							
Jan. 1, 1931.....	0.12¢	0.05¢	0.10¢	0.12¢	0.07¢	0.18¢	0.19¢
Add:							
Cost of Dairy Products Man-							
ufactured:							
Cost of Raw Material							
Butterfat.....	27.83	27.03	27.15	27.20	27.73	29.60	29.24
Hauling Cream.....	.17	None	.11	.20	.22	.03	.25
Total Cost of Raw							
Material.....	28.00¢	27.03¢	27.26¢	27.40¢	27.95¢	29.63¢	29.49¢
Creamery Labor.....	1.35	2.15	1.61	1.39	1.21	1.21	1.02
Manufacturing Expense..	2.30	2.89	2.66	2.43	2.23	1.95	1.70
Total Cost of Dairy Prod-							
ucts Manufactured.....	31.65¢	32.07¢	31.53¢	31.22¢	31.39¢	32.79¢	32.21¢
Inventory of Dairy Products—							
Jan. 1, 1931.....							
Plus Cost of Dairy Products							
Manufactured.....	31.77	32.12	31.63	31.34	31.46	32.97	32.40
Less:							
Inventory of Dairy Products—							
Dec. 31, 1931.....	.10	.11	.10	.09	.05	.20	.12
Total Cost of Dairy Prod-							
ucts Sold.....	31.67¢	32.01¢	31.53¢	31.25¢	31.41¢	32.77¢	32.28¢

APPENDIX B

Creamery patrons think in terms of butterfat. Patrons judge a cooperative creamery primarily on the basis of the price it pays for butterfat. The tables in Appendix B are presented for the use of those persons who prefer to use the butterfat basis for analysis.

The 117 creameries are classified on a basis of pounds of butterfat handled rather than on the basis of pounds of butter made. This classification gave a grouping of creameries as shown in Table 17 which differs from the grouping shown in Table 1, page 4, only in that four creameries which were in Group III with the butter classification

Table 17.—Creameries Classified on the Basis of Pounds of Butterfat Handled

Group No.	Group range	No. in Group
I	Under 100,000 pounds of butterfat.....	6
II	100,000 to 200,000 pounds of butterfat.....	48
III	200,000 to 300,000 pounds of butterfat.....	30
IV	300,000 to 400,000 pounds of butterfat.....	20
V	400,000 to 500,000 pounds of butterfat.....	6
VI	Over 500,000 pounds of butterfat.....	7
All	Total.....	117

Table 20.—Balance Sheet and Turn-over Ratios Reflecting the Average Financial Condition of 117 Minnesota Cooperative Creamery Associations Classified According to Amount of Butterfat Handled As of December 31, 1931

	No. of Creameries	Ratio of Current Assets to Current Liabilities	Ratio of Net Worth to Total Liabilities	Ratio of Net Worth to Fixed Assets	Ratio of Net Worth to Capital Stock	Ratio of Fixed Liabilities to Fixed Assets	Ratio of Pounds of Butterfat to Fixed Assets
All Groups	117	1.27	2.64	1.12	2.76	0.12	17.24
Group I	6	0.94	3.10	1.02	2.13	0.14	12.67
Group II	48	0.88	2.12	0.96	2.05	0.14	13.46
Group III	30	1.37	2.30	1.07	2.55	0.19	15.08
Group IV	20	1.17	2.84	1.19	3.04	0.05	18.78
Group V	6	2.45	5.45	1.54	6.37	...	27.36
Group VI	7	2.05	4.34	1.40	5.28	0.03	27.44

Table 21.—Average Cost of Dairy Products Sold by 117 Minnesota Cooperative Creamery Associations Classified According to the Amount of Butterfat Handled During the Year Ending December 31, 1931

	Average All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
No. of Creameries	117	6	48	30	20	6	7
Cost of Dairy Products Sold:							
Inventory of Dairy Products—Jan. 1, 1931	\$ 294.00	\$ 38.00	\$ 145.03	\$ 210.82	\$ 370.72	\$ 784.31	\$ 1,251.90
Add:							
Cost of Dairy Products Manufactured:							
Cost of Raw Material:							
Butterfat	69,333.31	22,922.12	41,873.36	64,807.60	92,434.86	130,155.05	198,669.51
Hauling Cream ..	430.14	None	176.00	478.11	738.30	143.41	1,701.33
Total Cost of Raw Material	\$69,763.45	\$22,922.12	\$42,049.36	\$65,285.71	\$ 93,173.16	\$130,298.46	\$200,370.84
Creamery Labor	3,360.39	1,823.68	2,480.50	3,369.63	4,079.07	5,338.85	6,922.25
Manufacturing Expense	5,719.70	2,454.66	4,108.73	5,740.74	7,641.88	8,556.51	11,551.40
Total Cost of Dairy Products Manufactured	\$78,843.54	\$27,200.46	\$48,638.59	\$74,396.08	\$104,894.11	\$144,193.82	\$218,844.49
Inventory of Dairy Products—Jan. 1, 1931							
Plus Cost of Dairy Products Manufactured	79,137.54	27,238.46	48,783.62	74,606.90	105,264.83	144,978.13	220,096.39
Less:							
Inventory of Dairy Products—Dec. 31, 1931..	247.76	89.57	156.52	176.84	228.14	878.07	828.76
Total Cost of Dairy Products Sold	\$78,889.78	\$27,148.89	\$48,627.10	\$74,430.06	\$105,036.69	\$144,100.06	\$219,267.63

Table 22.—Average Manufacturing Expense of 117 Minnesota Cooperative Creamery Associations Classified According to the Amount of Butterfat Handled During the Year Ending December 31, 1931

	Average All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
No. of Creameries.....	117	6	48	30	20	6	7
Manufacturing Expense:							
Fuel, Heat, Light, Power, Refrigeration, Ice and Water....	\$1,058.42	\$ 597.77	\$ 844.44	\$1,080.91	\$1,355.85	\$1,339.63	\$ 1,733.40
Supplies	2,748.15	1,019.52	1,806.93	2,738.53	3,748.63	4,546.39	6,325.23
Freight, Express and Drayage	286.13	134.84	244.24	226.67	320.85	342.97	809.90
Taxes	286.08	72.11	213.04	318.24	387.18	413.76	434.22
Insurance	165.42	145.70	130.17	171.68	211.92	241.47	230.69
Repairs	219.11	108.84	122.93	192.58	361.70	305.12	574.18
Depreciation	936.25	375.88	732.01	991.16	1,238.27	1,299.33	1,407.65
Miscellaneous.....	20.14	None	14.96	20.97	17.48	67.84	36.13
Total Manufactur- ing Expense ...	\$5,719.70	\$2,454.66	\$4,108.72	\$5,740.74	\$7,641.88	\$8,556.51	\$11,551.40

Table 23.—Average General and Administrative Expense of 117 Minnesota Cooperative Creamery Associations Classified According to the Amount of Butterfat Handled During the Year Ending December 31, 1931

	Average All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
No. of Creameries.....	117	6	48	30	20	6	7
General Administrative Expense:							
General Salaries	\$ 639.53	\$ 214.50	\$ 471.72	\$ 633.68	\$ 912.50	\$ 923.58	\$1,156.21
Office Expense	192.42	34.42	116.51	223.81	277.00	212.00	455.46
Audit and Legal.....	54.93	15.61	55.53	69.62	47.65	61.65	36.68
Bad Debts	10.06	None	12.63	14.71	None	21.50	None
Miscellaneous	119.20	46.07	92.84	117.33	178.00	190.08	141.84
Total General and Administrative Expense	\$1,016.14	\$ 310.60	\$ 749.23	\$1,059.15	\$1,415.15	\$1,408.81	\$1,790.19

Table 24.—Condensed Operating Statement Showing the Average Result of the Year's Operations by 117 Minnesota Cooperative Creamery Associations Classified According to the Amount of Butterfat Handled During the Year Ending December 31, 1931

	Average All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
No. of Creameries	117	6	48	30	20	6	7
Sales of Dairy Products	\$80,220.08	\$27,055.34	\$49,410.12	\$75,966.69	\$107,120.37	\$145,828.68	\$222,192.95
Cost of Dairy Products Sold	78,889.78	27,148.89	48,627.10	74,430.06	105,036.69	144,100.06	219,267.63
Gross Income or (Loss)	1,330.30	-93.55	783.02	1,536.63	2,083.68	1,728.62	2,925.32
General and Adminis- trative Expense	1,016.14	310.60	749.23	1,059.15	1,415.15	1,408.81	1,790.19
Operating Income or (Loss)	314.16	-404.15	33.79	477.48	668.53	319.81	1,135.13
Other Income	484.10	340.69	407.05	541.84	618.03	427.89	553.29
Total	798.26	-63.46	440.84	1,019.32	1,286.56	747.70	1,688.42
Other Deductions	376.62	120.00	296.27	471.57	483.42	330.76	474.69
Net Earnings or (Loss)	421.64	-183.46	144.57	547.75	803.14	416.94	1,213.73

Table 25.—Average Cost of Dairy Products Sold Expressed in Cents Per Pound of Butterfat Handled by 117 Minnesota Cooperative Creamery Associations Classified According to the Amount of Butterfat Handled During the Year Ending December 31, 1931

	Average All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
No. of Creameries	117	6	48	30	20	6	7
Cost of Dairy Products Sold:							
Inventory of Dairy Products— Jan. 1, 1931	0.12¢	0.05¢	0.10¢	0.09¢	0.11¢	0.18¢	0.19¢
Add:							
Cost of Dairy Products Manufactured:							
Cost of Raw Material Butterfat	27.83	27.03	27.15	27.23	27.59	29.60	29.24
Hauling Cream	0.17	None	0.11	0.20	0.22	0.03	0.25
Total Cost of Raw Material	28.00	27.03	27.26	27.43	27.81	29.63	29.49
Creamery Labor	1.35	2.15	1.61	1.42	1.22	1.21	1.02
Manufacturing Expense	2.30	2.89	2.66	2.41	2.28	1.95	1.70
Total Cost of Dairy Products Manufactured	31.65	32.07	31.53	31.26	31.31	32.79	32.21
Inventory of Dairy Products— Jan. 1, 1931							
Plus Cost of Dairy Products Manufactured	31.77	32.12	31.63	31.35	31.42	32.97	32.40
Less:							
Inventory of Dairy Products— Dec. 31, 1931	0.10	0.11	0.10	0.07	0.07	0.20	0.12
Total Cost of Dairy Products Sold	31.67¢	32.01¢	31.53¢	31.28¢	31.35¢	32.77¢	32.28¢

Table 26.—Average Manufacturing Expense Expressed in Cents Per Pound of Butterfat Handled by 117 Minnesota Cooperative Creamery Associations Classified According to the Amount of Butterfat Handled During the Year Ending December 31, 1931

	Average						
	All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
No. of Creameries.....	117	6	48	30	20	6	7
Manufacturing Expense:							
Fuel, Heat, Light, Power							
Refrigeration, Ice and							
Water	0.43¢	0.70¢	0.55¢	0.45¢	0.40¢	0.30¢	0.26¢
Supplies	1.10	1.20	1.17	1.15	1.12	1.03	.93
Freight, Express and Dray-							
age .....	.11	.16	.16	.10	.10	.08	.12
Taxes .....	.11	.09	.14	.13	.12	.09	.06
Insurance .....	.07	.13	.08	.07	.06	.06	.03
Repairs .....	.09	.17	.08	.08	.11	.07	.08
Depreciation .....	.38	.44	.47	.42	.37	.30	.21
Miscellaneous .....	.01	None	.01	.01	.00	.02	.01
Total Manufacturing Ex-							
pense	2.30¢	2.89¢	2.66¢	2.41¢	2.28¢	1.95¢	1.70¢

Table 27.—Average General and Administrative Expense Expressed in Cents Per Pound of Butterfat Handled by 117 Minnesota Cooperative Creamery Associations Classified According to the Amount of Butterfat Handled During the Year Ending December 31, 1931

	Average						
	All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
No. of Creameries.....	117	6	48	30	20	6	7
General and Administrative							
Expense:							
General Salaries	0.26¢	0.25¢	0.31¢	0.27¢	0.27¢	0.21¢	0.17¢
Office Expense .....	.08	.04	.07	.09	.08	.05	.07
Audit and Legal.....	.02	.02	.04	.03	.02	.01	.00
Bad Debts .....	.00	.00	.01	.01	None	.01	None
Miscellaneous .....	.05	.06	.06	.05	.05	.04	.02
Total General and Ad-							
ministrative Expense	.41¢	.37¢	.49¢	.45¢	.42¢	.32¢	.26¢

Table 28.—Condensed Operating Statement Expressed in Cents Per Pound of Butterfat Handled, Showing the Average Result of the Year's Operations by 117 Minnesota Cooperative Creamery Associations Classified According to the Amount of Butterfat Handled During the Year Ending December 31, 1931

	Average						
	All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI
No. of Creameries.....	117	6	48	30	20	6	7
Sales of Dairy Products....	32.20¢	31.90¢	32.04¢	31.93¢	31.97¢	33.16¢	32.71¢
Cost of Dairy Products Sold..	31.67	32.01	31.53	31.28	31.35	32.77	32.28
Gross Income or (Loss) ..	0.53	-0.11	0.51	0.65	0.62	0.39	0.43
General and Administrative							
Expense .....	.41	.37	.49	.45	.42	.32	.26
Operating Income or (Loss)	.12	-.48	.02	.20	.20	.07	.17
Other Income .....	.20	.40	.26	.23	.18	.10	.08
Total .....	.32	-.08	.28	.43	.38	.17	.25
Other Deductions .....	.15	.14	.19	.20	.14	.08	.07
Net Earnings or (Loss) ..	.17¢	-.22¢	.09¢	.23¢	.24¢	.09¢	.18¢

APPENDIX C

The 117 creameries in this study churned practically all of their butterfat into butter and had no large or important sidelines. The various schedules presented thus far are suitable for the use of such creameries.

The schedules shown in Appendix C are suitable for creameries where there are several important enterprises, such as a dryer, milk and cream department, condensed milk, casein, or ice cream departments.

Schedule 13.*—Sales of Dairy Products of the X Cooperative Creamery Association for the Year Ending December 31, 193—

Butter			
Shipped	.....	\$
Local	.....	\$
Patrons	.....	\$
Total Sales of Butter	.....		\$
Cream			
Shipped	.....	\$
Local	.....	\$
Total Sales of Cream	.....		\$
Milk			
Total Sales of Milk	.....		\$
Buttermilk			
Total Sales of Buttermilk	.....		\$
Powdered Products			
Skimmilk Powder	.....	\$
Sweet Cream Buttermilk Powder	.....	\$
Sour Cream Buttermilk Powder	.....	\$
Total Sales of Powdered Products	.....		\$
Casein			
Total Sales of Casein	.....		\$
Cottage Cheese			
Total Sales of Cottage Cheese	.....		\$
Condensed Milk			
Total Sales of Condensed Milk	.....		\$
Ice Cream			
Total Sales of Ice Cream	.....		\$
Total Sales of Dairy Products	.....		\$

* Schedule 11, page 27, shows a complete Income and Expense Statement suitable for creameries having large departments besides the butter department.

