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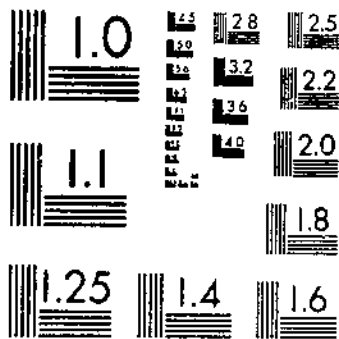
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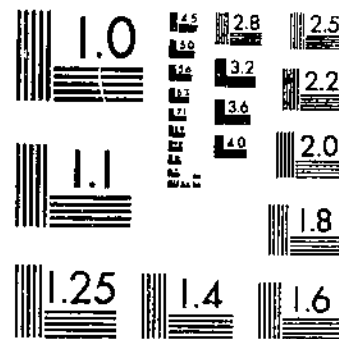
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U.S. DAIRY TECHNOLOGICAL BULLETINS
MARKETING MARGINS AND COSTS FOR DAIRY PRODUCTS
HOWE, C. B. 1-054

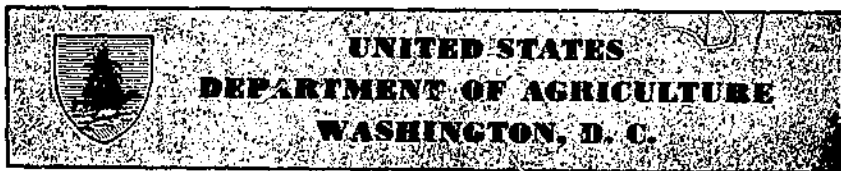
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Marketing Margins and Costs for Dairy Products¹

By CHARLES B. HOWE, *agricultural economist,*
Bureau of Agricultural Economics

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INTRODUCTION AND PRODUCT COMPARISONS

In war or peace, in good times or bad, there is interest in retail food prices and in the manner in which these retail values are divided between farmers and the marketing agencies.

In response to this interest, the Bureau of Agricultural Economics publishes monthly figures that show the retail price, the equivalent farm value, and the marketing margin for many food items. These figures for marketing margins, on which the calculations given in this publication are based, are derived by ascertaining the difference between the price paid by the consumer and the farm values of equivalent quantities of farm produce. Retail price, equivalent farm value, and marketing margin all provide a measure of the situation for the United States as a whole. They do not represent values applicable to any one consumer or farmer or marketing agency.

The way in which the marketing margin for each of the major dairy products was divided among the various agencies involved in getting these products from the producer to the consumer in 1939, as well as the division among marketing functions, and among types of operating costs and profits, is the subject of the present study.

In addition to the basic series of figures already mentioned, the Bureau of Agricultural Economics consolidates these farm-retail

¹Submitted for publication July 13, 1946.

price spreads per unit of specified products into comparable value terms for all dairy products by the use of the "market-basket concept". The market-basket concept is simple: it is the average quantity of foods purchased annually by a family of three average consumers during the period 1935-39. Thus, when changing prices are multiplied by these market-basket quantities, there is derived a measure of the changing value of consumer's expenditures for these fixed quantities of individual foods, for groups of related food items, and for the market basket as a whole (52, pp. 47-59).²

The 1939 retail value of the market-basket quantities of purchased dairy products amounted to \$64.64. This sum is about 20 percent of the family's total market-basket expenditure for all foods of domestic farm origin. Consumers use more of some dairy products than of others and this situation, together with the difference in the per unit price of the several dairy products, is reflected in the level of the expenditures for each product shown in table 1.

Of the 1939 retail value of the market basket of dairy products, fluid milk accounts for 45 percent. The next largest expenditure, about 27 percent, is for the group of "other" dairy products which consists mostly of ice cream and fluid cream. Butter accounts for 19 percent of the total, American cheese nearly 4 percent, and evaporated milk 5 percent.

For the dairy-products group as a whole, in 1939, the 52-percent share of the retail cost going to marketing agencies exceeds slightly the 48-percent share going to the farmer. Nonetheless, of all the food groups, only for the meat and the poultry and egg groups is the farmer's share as large a part of the consumer's dollar. For all foods combined, the farmer's share falls in the neighborhood of 39 percent of the retail price.

It is apparent that the share of the consumer's expenditure for dairy products going to marketing agencies—that is, the percentage marketing margin—is comparatively small. The division of the

TABLE 1—Dairy products in the market basket: Retail cost, farm value, marketing margin, and farmer's share of retail cost, 1939¹

Product	Retail cost		Farm value		Marketing margin		Farmer's share
	Actual	Percentage of all dairy products	Actual	Percentage of all dairy products	Actual	Percentage of all dairy products	
	Dollars	Percent	Dollars	Percent	Dollars	Percent	Percent
Fluid milk.....	28.91	44.7	15.89	50.9	13.02	30.1	55
Butter.....	12.22	18.9	7.86	25.1	4.36	13.1	64
American cheese.....	2.79	4.3	1.35	4.3	1.44	4.3	48
Evaporated milk.....	3.71	5.0	1.17	3.7	2.01	6.1	36
Total 4 products.....	47.13	72.9	26.27	83.9	20.86	62.6	76
Other products, including ice cream.....	17.51	27.1	5.05	16.1	12.46	37.4	29
All dairy products.....	64.64	100.0	31.32	100.0	33.32	100.0	49
Total market basket (all farm food products).....	316.19		122.04		194.15		39

¹ Average annual purchases by a family of three (253.6 quarts of fluid milk, 39.3 pounds of butter, 11.6 pounds of cheese, 45.9 14½-ounce cans of evaporated milk, and 27.0 pounds of other dairy products.)

² Italic numbers in parentheses refer to Literature Cited, p. 79.

consumer's dollar between the farmer and the marketing agencies in 1939, however, varies for each of the dairy products. For butter and fluid milk, the marketing margin is smaller than the farmer's share. For American cheese, the division is about equal. For evaporated milk and the "other" dairy products, the marketing margin is 64 and 71 percent, respectively, of the retail cost.

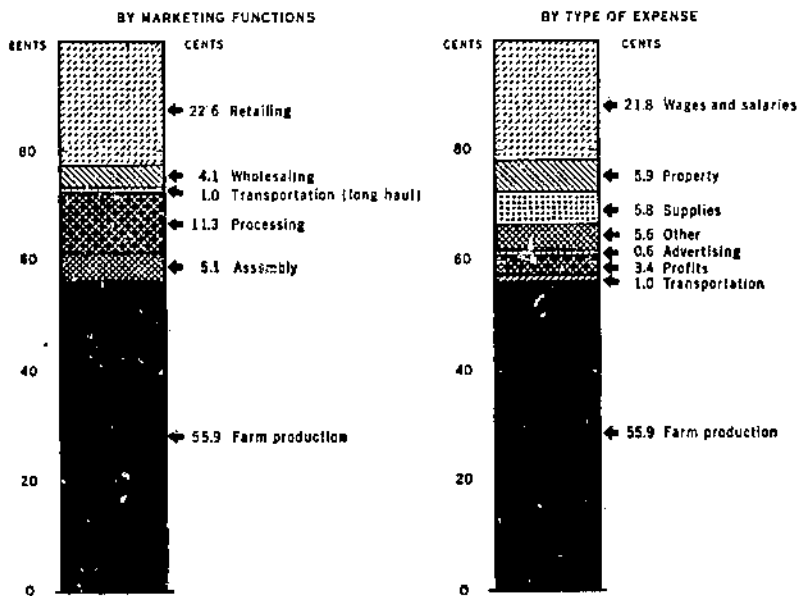
Besides the differences in marketing margins for each of the major dairy products in 1939, important differences were observed in the types of costs incurred by marketing agencies in the processing and distribution of these products. To evaluate these differences in the individual commodity sections that follow, the marketing margins will be broken up and reassembled in several different ways. One break-down will show the division of the total margin for each product among the various agencies; another, the division according to type of expense; and still another, the break-down by marketing functions.

By way of summary at this point the results are given of two of these divisions of the market-basket expenditure for a combination of the four major dairy products—fluid milk, butter, cheese, and evaporated milk. The market-basket expenditure for these products in 1939 totaled \$47.13. The farm value of equivalent dairy produce was \$26.27. Thus \$20.86 represents the marketing margin. About one-half of this sum went to pay the cost of retailing, one-fourth went for processing, and the remaining one-fourth went for wholesaling, assembling, and long-haul transportation. This is the distribution of the marketing margin during 1939 according to marketing function.

By type of expense, the 1939 marketing margin was divided as follows: Half of the marketing margin went to pay the cost of wages and salaries and a little more than one-fourth, equally divided, represents the cost of property and of supplies. The cost of supplies consisted mostly of charges for containers. The property charge, in contrast, embraced a variety of items like rent, depreciation, fuel, light, and power. Profits were roughly estimated at 7 percent of the marketing margin.

These summary figures, also presented in figure 1 in terms of the consumer's dollar, are useful in laying out the general shape of the pattern as it existed in 1939. Fluid milk, as shown in table 1, accounts for \$13.02 out of a total marketing margin of \$20.86. This is in keeping with the fact that the market-basket expenditure for fluid milk was \$28.91, out of a total of \$47.13 for fluid milk, butter, American cheese, and evaporated milk.

This is the distribution estimated for the single year 1939. The course of the marketing margin for other years, together with the yearly average retail price and the equivalent farm value for the major dairy products, is shown in figures 2, 3, 4, and 5. The marketing margin is shown in the lower portion of the charts in two forms—first in terms of cents per unit of product, and then as a percentage of the retail price. These percentage margins may be interpreted also as the number of cents going to marketing agencies out of each dollar spent by consumers for the product. Without exception, the margin when expressed in terms of cents is the more stable figure. Moreover, when retail prices change their levels sharply, as was the case during the first half of the decade of the 1930's, the percentage margin is pushed in the opposite direction.



DAE 45011

FIGURE 1.—Approximate distribution of consumer's dollar spent for 4 principal dairy products—fluid milk, butter, American cheese, and evaporated milk—United States, 1939.

The characteristic course of the marketing margin for dairy products is one of considerable change. All of these charts disclose a declining absolute margin in the early part of the decade of the 1930's which was accompanied by a marked rise in the share of the consumer's dollar received by marketing and processing agencies. When retail prices fall abruptly a change in relationships usually occurs which gives the farmer a smaller and the marketing agencies a greater part of the consumer's dollar. This may occur even in the face of a decline in the cents-per-unit margin. The reason is that there is a greater stability in margins than in prices at retail and at the farm.

Other trends are to be noted. Evaporated milk shows a declining absolute margin, which persists over the period 1920-39, but at the same time wide changes develop in the marketing margin, with the margin during the early thirties fully as large as that 10 years earlier. The margins for American cheese and for butter, when expressed in the terms of cents per pound, mark out two levels, the level for the first half of the period being higher than for the last half. Yet at the same time, the marketing margin for cheese seems to have grown slightly larger as the years passed whereas that for butter, except during the early thirties does not appear to have changed notably.

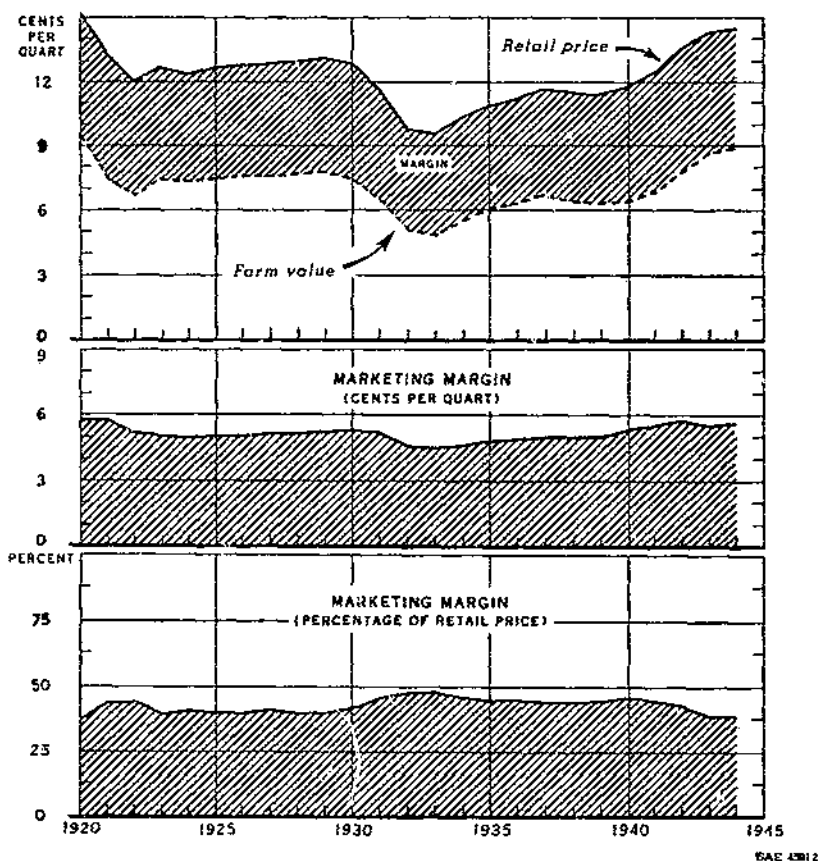


FIGURE 2.—Retail prices and equivalent farm value per quart and marketing margin, fluid milk, 1920-44.

Fluid milk shows a relatively stable margin over the entire period of about 5 cents a quart, but the tendency is still evident for the marketing margin to increase.

All told, this historical record emphasizes the fact that the marketing margin changes substantially from year to year. In consequence, it is well to emphasize that the observations which follow are concerned primarily with the facts that arise out of the situation that existed during the single year 1939.

The presentation of the details concerning each of the four dairy products begins with a consideration of fluid milk.

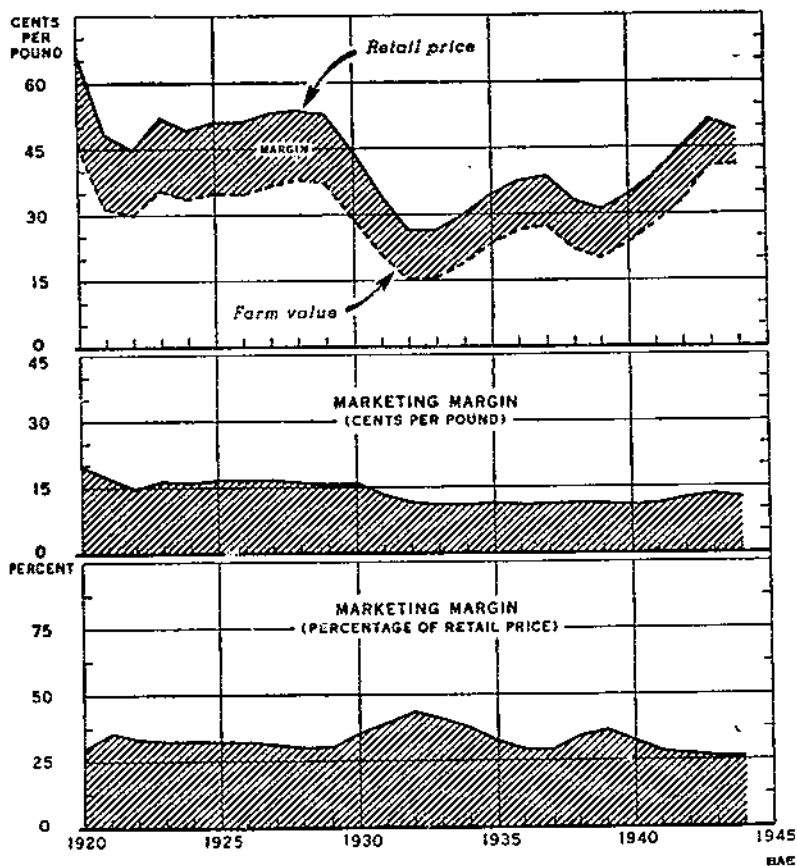
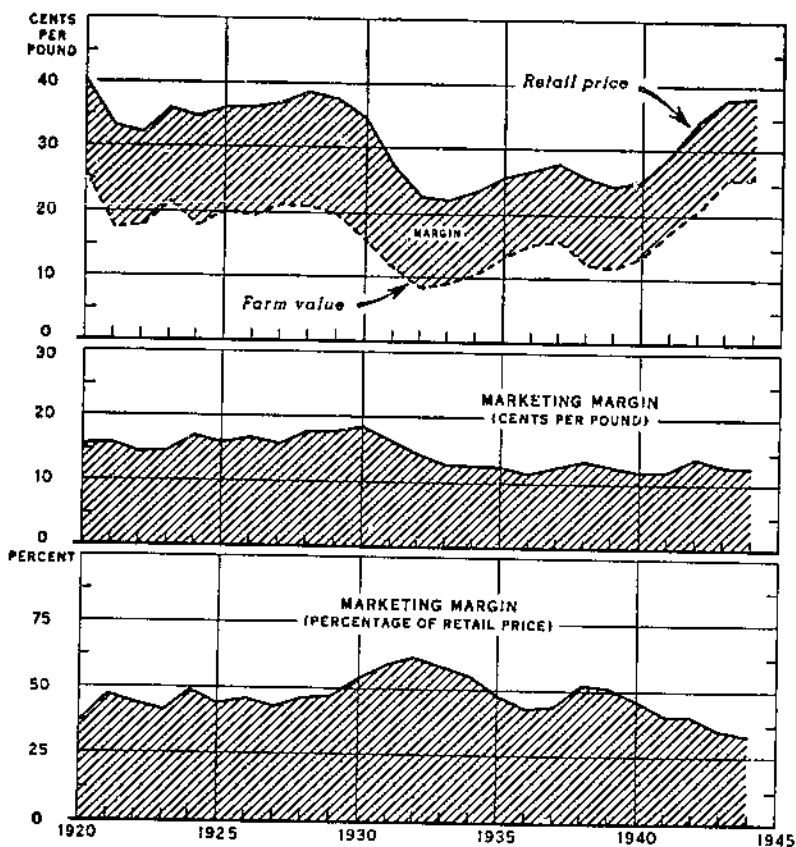


FIGURE 3.—Retail prices and equivalent farm value per pound, and marketing margin, butter, 1920-44.

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FIGURE 4.—Retail price, and equivalent farm value per pound, and marketing margin, American cheese, 1920-44.

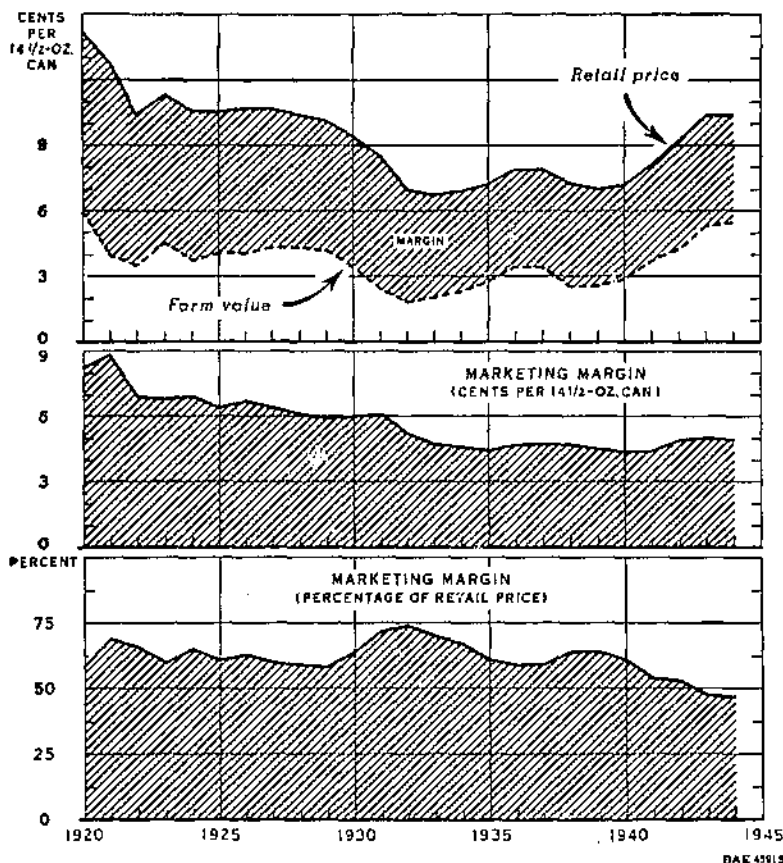


FIGURE 5.—Retail prices, and equivalent farm value per 14½-ounce can, and marketing margin, evaporated milk, 1920-44.

MARKETING MARGINS AND COSTS FOR FLUID MILK

Efficient methods of distributing fluid milk to urban consumers has been the subject of students' attention for a long time and of local, State, and national legislation and regulatory action. It has provided a topic for endless debate. In consequence, an extensive body of literature on the subject has accumulated over the years. Parts of this literature, concerned with the question of marketing costs of individual concerns, are reported in the following paragraphs. Although the conditions found in the numerous urban markets for fluid milk are in some respects similar, in other important respects they are so different that the detailed evidence with respect to any particular concern and market cannot be considered as representative of the situation for the United States as a whole. However, these uncoordinated data have provided much of the basis for 1939 average estimates for the United States which are presented here.

One third of the milk produced on the farms of the United States during 1939 was consumed as fluid milk and cream by people living

in urban areas.³ Nearly 45 percent of the market-basket expenditure for dairy products was for fluid milk. Out of the total market-basket expenditure for fluid milk, 55 percent represents the share of the farmers and 45 percent the marketing margin (table 1). The 1939 average retail price per quart of fluid milk was 11.4 cents, the farm value was 6.3 cents, and the marketing margin was 5.1 cents. The average retail price includes an allowance for the important share of fluid milk which farmers sell directly to consumers and which bears no marketing charge by any specialized marketing agency.

MARKETING CHANNELS

The distribution of fluid milk to urban areas tends to be a highly localized activity. This is true not only because milk is so bulky and perishable that it cannot be shipped advantageously over great distances, but also because regulatory authorities have endeavored to confine the area of supply in order to facilitate their supervision of production and handling. In some markets, producers and their organizations have attempted to restrict the supply area and their efforts have been another factor in limiting the extent of milksheds. The marketing channels through which fluid milk moves from farms to urban consumers is shown in figure 6, which also shows estimates of the relative quantities of fluid milk moving through each channel for the United States as a whole. The typical movement is from producer through city pasteurizing plant to consumer.

The bulk of the volume moves over a limited number of routes. With the growth of urban centers, milk producers and milk-consuming families have become more widely separated. This separation comes about not only because of distance but also because the kind and number of services now required to carry on a modern milk-processing

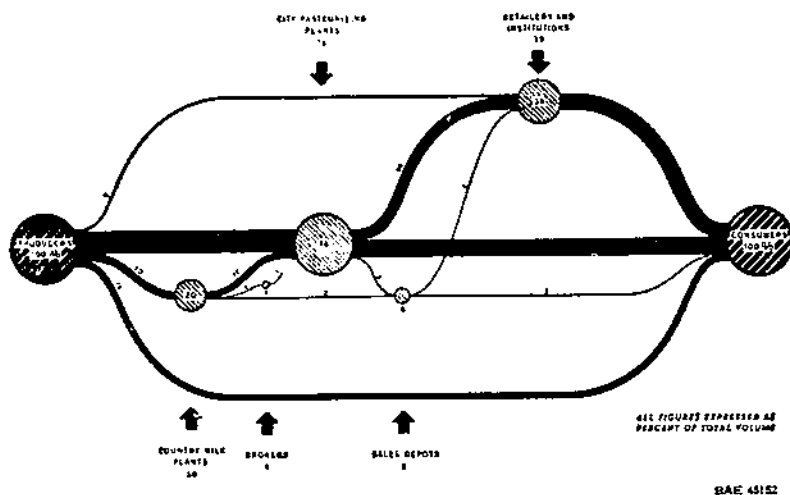


FIGURE 6 — Marketing channels for fluid milk, United States, 1939.

³ Farm production, distribution, and income from milk 1943-44, U. S. Bur. Agr. Economics, April 1945. (Processed).

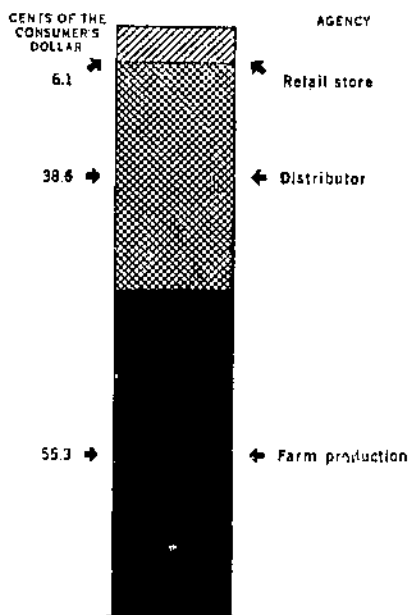
and distribution business have been considerably expanded. In consequence, the producer-dealer type of distribution (where the farmer both produces and distributes his product) appears to be confined mainly to the smaller towns and to the edges of metropolitan centers. The volume sold by producer-dealers is estimated at 15 percent of the total fluid milk sold at retail during 1939. The remaining 85 percent was handled by milk dealers of one kind or another. More than half of the 85 percent handled by dealers other than producer-distributors is moved directly from the farms to the city pasteurizing plants. This routing, accordingly, must be considered as the channel to be expected in all markets at which the average distance between city and farm is relatively small.

Where the milkshed has come to embrace several counties or States, it has been found desirable to place country plants in positions that lie between the producers and the city plant. Such country plants are estimated to handle only 20 percent of the total volume of fluid milk sold in the United States.

Thus the city plant is the hub about which turns the fluid-milk distribution system. More than three-fourths of the total milk sold at retail flows through this agency. In turn, the city plant is the largest single factor, considering the United States as a whole, engaged in the supply of the fluid-milk requirements of household consumers.

DIVISION OF THE CONSUMER'S DOLLAR

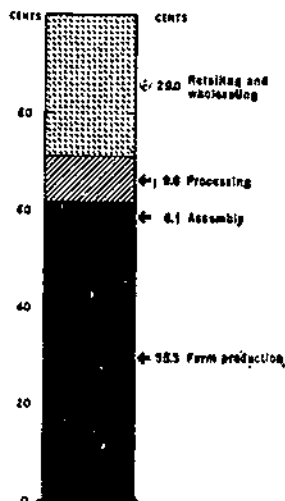
The estimated distribution of the consumer's dollar spent for fluid milk during 1939, by marketing agencies, is shown in figure 7.



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FIGURE 7.—Approximate distribution of the consumer's dollar spent for fluid milk, by agencies, United States, 1939.

The margin of retail stores for fluid milk is estimated at 2½ cents a quart. The Federal Trade Commission, summarizing the operating experience of 32 milk distributors for the year 1940, concluded that the average assembly costs of these concerns was 15.7 percent of their total operating cost, that processing equaled 23.5 percent and that distribution accounted for the remaining 60.8 percent.⁴ When these distribution costs are combined with the estimated handling cost of retail stores, and allowance is made for fluid milk sold by farmers directly to consumers, the break-down, according to marketing functions, of the consumer's dollar spent for fluid milk is as shown in figure 8.



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FIGURE 8.—Approximate distribution of the consumer's dollar spent for fluid milk, by functions, United States, 1939.

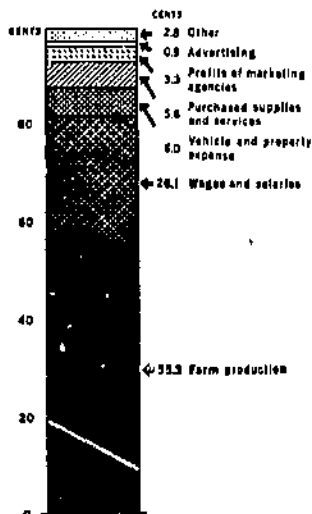
The Federal Trade Commission also reports for the year 1939 a distribution according to types of expense incurred by milk dealers which is as follows: wages and salaries, 59.4 percent; vehicle and property expense, 14.5 percent; profit, 7.1 percent; advertising, 2.9 percent; and other expenses, 16 percent. A number of reports have been prepared by other agencies with respect to such market areas in Wisconsin, Maine, New York, West Virginia, Indiana, Pennsylvania, and New Jersey. These show expenditures for wages and salaries ranging from 49 to 64 percent of the total dealer expenses. The range in the expenditures for supplies was from 9 to 29 percent, while that for property and vehicle expense was from 17 to 33 percent. Expenditures for advertising fell in the neighborhood of 2 percent with credit loss amounting to 1 percent.

These latter figures were combined with those provided by the Federal Trade Commission. The estimates resulting from this combination according to the type of expense are as follows: wages and salaries, 58.8 percent; vehicle and property expense, 13.7 percent; purchased supplies, 13.7 percent; profit, 7.8 percent; advertising, 2.0

⁴ Unpublished data in the files of the Federal Trade Commission.

percent; other, 4.0 percent. Expenditures itemized in handling milk in retail stores in Boston during 1935 included: store labor, 48 percent; rent, 8 percent; administration, 6 percent; supervision, 4 percent; depreciation, 4 percent; advertising, 2 percent; other, 28 percent (26).

Combining these several sets of data resulted in the estimate of the distribution of the consumer's dollar spent for fluid milk according to type of expense, shown in figure 9.



DAK 43131

FIGURE 9.—Approximate distribution of the consumer's dollar spent for fluid milk, by type of expense, United States, 1939

ANALYSIS OF MARGINS

MILK ASSEMBLY.—Fluid milk is trucked directly from the farms to the city processing plant in most market areas of the United States. Exceptions are the extensive markets of New York City, Boston, Philadelphia, Detroit, Chicago, and New Orleans, where a considerable part of the supply is first received at country plants for later shipment to the consuming center. Most of the fluid milk, however, whether hauled to the country or to the city plant, moves by commercial truck (table 2). A small but increasing percentage is handled by cooperative trucking systems.

All manner of vehicles are used for milk hauling. For small loads, pick-up trucks are commonly used.

The average fee for hauling milk has been reported to range from 13.5 cents to 28.0 cents per hundredweight (table 3). Within a given market, the range of charges to individual farmers was even larger, varying from 10 to 50 cents per hundredweight in one Mississippi market. There is little doubt that the length of haul, the volume loaded per stop, and other physical factors enter into the establishment of hauling charges, yet the actual rate structure in many markets

TABLE 2.—Relative importance of commercially hauled milk in various areas of the United States

City or area	Year	Hauled commercially	
		Percentage of patrons	Percentage of supply
New England (to country plants) ¹	1944		87
New England (to city plants) ¹	1944		88
New York City (16 country plants) ²	1942	86	
Rochester, N. Y. ³	1943	97	
Syracuse, N. Y. ⁴	1944	88	
Harrison County, W. Va. ⁵	1942	90	85
Mississippi, northeast area ⁶	1941		80
New Orleans, La. ⁷	1942	86	91

¹ MacLeod (22).

² Johnson (18).

³ JOHNSON, S., ROCHESTER MILK MARKETING AREA. N. Y. State Agr. Col. Agr. Econ. Mimeograph Bul. 446, July 1943.

⁴ JOHNSON, S. M., and CUNNINGHAM, L. C. SYRACUSE MILK MARKETING AREA. N. Y. State Agr. Col. Agr. Econ. Mimeograph Bul. 473, February 1944.

⁵ ABRAHAMSEN, M. A. MILK ASSEMBLING AND DISTRIBUTION IN HARRISON COUNTY, W. VA. W. Va. Agr. Expt. Sta. Mimeograph Cir. 47, May 1943.

⁶ Mebus (28).

⁷ GRIGSBY, R. M., and BALLINGER, R. A. HAULING MILK TO RECEIVING STATIONS IN THE NEW ORLEANS MILKSHED. La. Agr. Expt. Sta. Mimeograph Cir. 28, July 1942.

TABLE 3.—Charges for hauling milk from farms to plants

Area	Year	Producers	Hauling rate per 100 pounds	
			Average	Range
New York, 16 country plants ¹	1942	Number	Cents	Cents
Rochester, N. Y., city delivery ¹	1943	1,459	13.5	
Syracuse, N. Y., city delivery ²	1944	1,278	24.1	15 to 33
New England, city delivery ³	1944	856	20.6	7 to 30
New England, country plants ⁴	1944	(⁵)	28.0	
New Orleans, La. ⁶	1944	(⁵)	15.0	
Harrison County, W. Va. ⁷	1942	1,802	22.2	
Mississippi, northeast area ⁸	1942	499	26.2	
Bloomington, Ill. ⁹	1941		22.8	10 to 50
Indiana, 19 cities ¹⁰	1942	495	25.6	
	1940	9,228	23.0	

¹ Johnson (18).

² JOHNSON, S. M., ROCHESTER MILK MARKETING AREA. New York State Agr. Col. Agr. Econ. Mimeograph Bul. 446, July 1943.

³ JOHNSON, S. M., and CUNNINGHAM, L. C. SYRACUSE MILK MARKETING AREA. New York State Agr. Col. Agr. Econ. Mimeograph Bul. 473, February 1944.

⁴ MacLeod (22).

⁵ All producers.

⁶ GRIGSBY, R. M., and BALLINGER, R. A. HAULING MILK TO RECEIVING STATIONS IN THE NEW ORLEANS MILKSHED. La. Agr. Expt. Sta. Mimeograph Cir. 28, July 1942.

⁷ ABRAHAMSEN, M. A. MILK ASSEMBLING AND DISTRIBUTION IN HARRISON COUNTY, W. VA. West Virginia Agr. Expt. Sta. Mimeograph Cir. 47, May 1943.

⁸ Mebus (28).

⁹ Bartlett and Mutti (4).

¹⁰ Hardin (14).

seems to be based much more directly upon custom and bargaining power than upon services rendered.⁵

Charges for assembling milk on particular routes might be reduced either by lowering the fees of commercial haulers which are out of line with the cost of service rendered or by a reorganization of milk routes.

⁵ Several students of milk transportation, working independently and in widely separated markets, have reported this lack of close relationship between hauling charges and costs of services rendered. See: Hammerberg (13); Bartlett and Caskey (5); MacLeod and Geraghty (24); Mortenson (32).

The relative importance of these two methods for accumulating savings differ between markets, hence the proposals for reducing hauling charges are not similar. Some proposals call for the supervision or the operation of truck routes by cooperative organizations. Where cooperatives have exercised control over milk hauling they have done so either by means of hauling contracts or by leasing arrangements of various kinds.

Another approach to the matter of reducing hauling charges on individual routes is for representatives of the local committees of producers, truckers, and dealers to act jointly under the authority granted to some regulatory body such as the Office of Defense Transportation. One of the first attempts of this kind was made in Colebrook, N. H., with the result that the number of trucks was reduced from 34 to 16 and the mileage traveled daily was reduced from 747 to 434 (82).

Another method, differing only in minor respects from these two, involves the establishment of standards of operating efficiency for milk-hauling routes. These standards might be based on such factors as the pounds of milk hauled per patron and the miles from the plant to the most distant patron.⁶

Owing to variations between markets and between individual routes within the same market area a general statement regarding the amount by which hauling charges of individual routes may be reduced has little value. Nonetheless, if, as is shown to be the case from the data in table 3, hauling charges now average about 0.4 cent per quart of milk, the amount of potential reduction per quart would appear to be small.

COUNTRY-PLANT OPERATION.--It is customary for city plants to obtain their supplies from country plants rather than directly from farmers, in the case of the large markets drawing supplies from a broad milkshed. Early in 1944 there were 448 country plants operating in the New York milkshed, 106 in the Boston milkshed, and 44 in the Philadelphia area. In addition, the markets of Chicago, Detroit, and New Orleans draw large supplies through country plants.

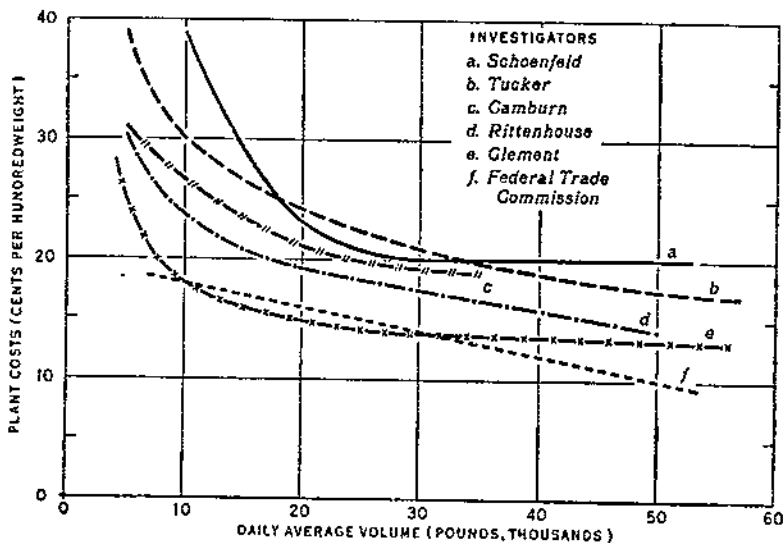
At the same time, some areas depend upon country plants during only a part of the year. There is a difference also in the equipment of country plants; some are equipped to receive, cool, and ship the fluid milk, and others are prepared to manufacture one or more dairy products.

The operating costs of country plants, unlike hauling charges which are customarily paid by the farmers, are taken into account by regulatory agencies when prices to producers are being established. Ordinarily the plant operator is permitted to take a standard fee for that portion of the milk received which is used for fluid purposes, and this deduction is the same for all concerns regardless of the capacity of the plant or its geographic position.

Plant operating costs appear to vary with the scale of operation. The average cost-volume relationship, as reported by various investigators is summarized in figure 10.⁷

⁶ MATZEN, E. H. A TRANSPORTATION CONSERVATION PLAN FOR TRUCKS ASSEMBLING MILK IN INDIANA. Purdue Agr. Econ. Mimeograph Cir. 27. 1943.

⁷ Schoenfeld (40); Tucker (46); Camburn (?); Massachusetts Milk Control Board (26); Clement (9); Federal Trade Commission (59); Bressler (6).



BAE 32019

FIGURE 10.—Average cost-volume relationships in milk-plant operations, as reported by six investigators.

More recent studies have disclosed average costs of selected plants in eastern markets to be about 13 cents per hundredweight (tables 4 and 5), with the cost of individual plants ranging from below 10 cents for those with the largest volume to over 20 cents for the smallest (table 6). In 1937, the average cost for 157 country plants which supplied the New York, Chicago, Detroit, Philadelphia, Baltimore, Boston, St. Louis, Kansas City, and Harrisburg markets, was 15.65 cents per hundredweight, with the range varying from 12.04 cents for the group handling the largest volume to 27.85 cents for those with the smallest volume (table 7).

In a New England study, it was estimated that with average daily volume of 4 to 5 thousand pounds of milk, plant costs would be nearly 30 cents a hundred pounds. When the volume reached 20 thousand pounds, average cost would fall to 13 cents and with further increases in volume the cost would be about 10 cents per hundredweight (5).

Other factors, however, influence operating costs in country plants. Pronounced seasonal fluctuation in volume would reduce the daily average volume that could be handled by a given plant below its optimum capacity and thus would increase the average cost per hundredweight of milk. A relatively even production over the entire year would permit continuous operation near the least-cost level of volume.⁸

The number of hours during which a country plant receives milk also affects the cost of operation. The period during which milk must be received is limited for several reasons. Sometimes milk must be ready for early shipment to market, efficient operation often requires that the total hours of operation be limited, and some

⁸ CASKEY, W. EFFECTS OF SEASONAL MILK PRODUCTION ON MARKETING COSTS. Ill. Agr. Ext. Ser. February 1936. [Processed.]

TABLE 4.—Unit costs of handling milk in country receiving plants in northern New Jersey, year ended June 30, 1942

Plants (number)	Average volume per year	Average cost of operation per hundred-weight
	Million pounds	Cents
5.....	5.5	6.2018
9.....	12.1	.1060
9.....	21.0	.1689
All plants.....	14.2	.1359

Spencer (14).

TABLE 5.—Average volumes of milk received and costs of operation of selected country plants in the New York milkshed, 1939-42

Year	Plants		Average cost of operation, per hundred-weight
	Number	Cans ¹ per plant per day	Cents
1939.....	105	352	13.3
1940.....	125	387	12.4
1941.....	121	372	12.3
1942.....	129	393	13.4

¹ Contents of can—86 pounds.

Data presented at hearing on State and Federal marketing order, March 18, 1943, Brooklyn, N. Y., by J. O. Eastlack, for plants owned by members of the New York Metropolitan Milk Distributors' Bargaining Agency.

health regulations specify that uncooled morning milk may not be delivered after a certain hour.

There is no question that the cost of operating a country plant is related to the volume handled. This observation has prompted a proposal calling for a thorough-going program of plant consolidation. It has been shown that if approximately one-half of the country plants in New England were closed the remaining plants could handle the total volume easily and efficiently.⁹ If so, the savings in the operating cost of the remaining plants (if they did not have to assume the fixed charges of the idle plants) would amount to about 10 cents a hundredweight. This figure establishes the maximum possibilities, but savings of this magnitude would come about from a reduction in profits as well as from a reduction in operating costs. In the absence of such a reorganization, it is possible that the maximum economies in the country-plant operations in the New England area would not exceed 6 or 7 cents per hundredweight (22).

A program of consolidation of country plants, however, must consider the physical distribution of the existing plants, the organization of the milk-assembly routes, and the situation with respect to transportation from country plants to the city. An increase in the quantity of milk assembled at one point may decrease plant cost but may also increase the cost of gathering milk to such an extent that there might be no net savings. The generally applicable rule is that the most efficient organization for the whole country-marketing

⁹ BOSTON MILK ADMINISTRATION OFFICE. PLAN FOR ADAPTING NEW ENGLAND MILK MARKETING TO WARTIME NEEDS. 1943. [Processed.]

TABLE 6.—Volume of milk received and costs of operation of country plants, New York milkshed, 1939 and 1940

Range, cans ¹ per day per plant	1939			1940		
	Average cans per day per plant	Plants	Average cost of operation, per hundred-weight	Average cans per day per plant	Plants	Average cost of operation, per hundred-weight
	Number	Number	Cents	Number	Number	Cents
0-200.....	159	11	20.3	0-200.....	157	12
201-300.....	255	29	18.2	201-300.....	257	26
301-400.....	343	36	13.8	301-400.....	345	38
401-500.....	447	16	11.1	401-500.....	444	28
501-600.....	548	6	11.0	501-600.....	549	12
601-700.....	625	3	11.4	601 and over.....	782	11
701 and over.....	801	4	8.7			
All plants.....	352	105	13.3	All plants.....	387	125
						12.4

¹ Contents of can=85 pounds.

Data presented at hearing on State and Federal marketing order, March 18, 1943, Brooklyn, N. Y., by J. O. Eastlack, for plants owned by members of the New York Metropolitan Milk Distributors' Bargaining Agency.

TABLE 7.—Operating costs per 100 pounds of milk received at 157 country receiving stations

Range of daily milk receipts (pounds)	Plants	Milk received daily per plant	Total operating cost per 100 pounds	Cost for labor only	
				Per 100 pounds of milk	Percentage of total operating cost
	Number	Pounds	Dollars	Dollars	Percent
Less than 5,000.....	9	3,013	0.2785	0.1813	61.3
5,001 to 10,000.....	49	7,711	.1747	.0938	55.8
10,001 to 20,000.....	53	14,050	.1426	.0802	53.0
20,001 to 30,000.....	18	24,839	.1217	.0663	52.4
30,001 to 40,000.....	10	34,356	.1559	.0690	42.9
Over 40,000.....	13	55,493	.1204	.0566	44.7
Total or average.....	157	18,772	.1505	.0880	62.5

¹ 7 plants. ² 35 plants. ³ 44 plants. ⁴ 15 plants. ⁵ 9 plants. ⁶ 15 plants. ⁷ Average of 125 plants.

Reproduced from Clement (9, p. 18).

function involves plants of such a size that the combined cost of assembly, plant operation, and transportation to market is at a minimum (5).

TRANSPORTATION FROM COUNTRY TO CITY PLANTS.—Most shipments of milk from country to city plants are of bulk raw milk in tank trucks or tank cars. During the last 20 years, shipments have shifted from cans to tanks and from rail to truck. Long-distance trucking of milk began about 1925, but did not become important until a few years later. The shift from cans to tank cars occurred largely between 1925 and 1935 for rail shipments, and since 1935 for truck shipments (61; 37; 42).

Rate structures for both rail and truck shipments of milk from country plants to city plants have become somewhat stabilized in recent years, with truck and rail rates to the same points bearing definite relationship to one another. In general, rates increase with the distance of a country plant from its market. In the New York milkshed, the average rate charged by railroads and truckers for

transporting milk from country plants to New York City in January 1943 was about 0.7 cent per quart.¹⁰ But the individual charges varied with distance and they also reflected special competitive conditions. In the Boston milkshed, the charge for transporting milk from the 221-230 mile zone to Boston, in 1940, was estimated at 36.0 cents per hundredweight by tank truck, 32.2 cents by tank car if both country and city plants were on rail, and 41.1 cents by tank car if the country plant was 5 miles off rail and the city plant was 3 miles off rail. These costs include allowances for loading and for transfers as required, as well as the direct hauling charges (42).

It has been held that savings to plant operators in the cost of transporting milk from country to city plants would follow if tank cars were loaded more nearly to capacity, if milk shipments were diverted to less expensive transportation, and if milk for fluid use were drawn only from those plants located nearest the city.

The coming of full loads, which is the first of these proposals, to a large extent must wait upon an increase in the volume of milk received at country plants, which presumably will come about after the adoption of a program of plant consolidation. It has been estimated that in New England one-half of the country plants handle volumes so small that the use of tank-car equipment is not feasible (22). The second proposal calls for a reduction in the quantity of milk moved in cans with a corresponding increase in tank-car shipments. The third involves a zoning of the milkshed.

Under the third plan, plants in the first zone would ship all of their receipts as fluid milk, plants located in the intermediate zone would supply the market with fluid milk only during the season of short supply, and the most distant plants would not contribute to the fluid-milk supply at any time during the year.

All of these proposals were advanced during the war, but it is an interesting fact that no substantial changes in this phase of milk marketing were made in spite of wartime shortages.

CITY-PLANT OPERATION.—Processing is the next stage in the flow of fluid milk from the farms to the city consumers. Principal operations involved are pasteurization, cooling, and bottling.

A large number of firms are engaged in distributing milk, yet in most cities the substantial part of the total volume is handled by a few large firms. This is especially true of the larger cities where, in 1931, almost two-thirds of the total sales of fluid milk were handled by the three dominant firms. It is true that as cities decrease in size the relative importance of the volume handled by the dominant firms tends to decrease, but even in the small towns this tendency of a few firms to dominate the market still can be observed (table 8), (25; 41).

City plants, like plants located in the country, appear to be capable of achieving economies of scale through planned reorganization. Substantial economies are promised in the lower volume range. A small pasteurizing plant that handles a volume of 250 quarts daily, it is estimated, would have costs equal to 3 cents a quart, but when the volume is increased to 2,500 quarts the cost would fall to about a cent and a half. Not unreasonable is the estimate that costs might be as low as 1 cent a quart with efficient large-scale operation (41; 44; 26).

¹⁰ Unpublished data supplied by Leland Spencer, Cornell University.

The average costs of operating fluid-milk processing plants, including the cost of bottles and containers, have been reported to lie within the range of 1 to 2 cents a quart. Although they are not strictly comparable, these reports, which are summarized in table 9, illustrate the range in costs of processing fluid milk.

Cost of operating industrial milk plants may be reduced by careful adjustment of their operating organization to handle optimum low-cost volumes consistent with their market outlets and sources of supply. There are large differences between plants in the degree to which capacity operations are realized. For example, in California during 1942 many plants were operating far below their capacity so

TABLE 8.—Number of milk distributors and relative volume handled by larger distributors in leading cities of the United States, 1931

Region	Distributors per city	Percentage of milk distributed by—	
		Three largest firms	All others
Cities of 100,000 to 500,000 population:	Number	Percent	Percent
Northeast.....	63	48	52
Central West.....	80	47	53
Far West.....	38	52	48
South.....	120	57	43
All sections.....	82	51	40
Cities of more than 500,000 population:			
All sections.....	102	64	36

Spencer (43).

TABLE 9.—Cost of processing fluid milk in city plants, including cost of bottles and containers, by markets

Market	Year	Cost per quart
		Cents
Milwaukee (6 companies) ¹	1933	1.01
Boston ²	1934-35	1.00
Maine (10 markets) ³	1934-36	1.55
West Virginia (67 producer-leaders) ⁴	1935-38	1.55
New York (92 producer-dealers) ⁵	1935-36	1.77
California ⁶	1937	1.28
Chicago ⁷	1941	1.40
New Jersey ⁸	1941-42	.....
Northern:		
Bottled, retail.....		1.44
Bottled, wholesale.....		1.29
Paper, wholesale.....		1.96
Southern:		
Bottled, retail.....		1.43
Bottled, wholesale.....		1.63
New York City ⁹	1941	.....
Retail, 1-quart bottles.....		1.40
Retail, 2-quart bottles.....		1.15
Wholesale, 1-quart bottles.....		1.10

¹ Mortenson (22).

² Massachusetts Milk Control Board (26).

³ Dow (11).

⁴ Herrmann (15).

⁵ Hughes (18).

⁶ Tinley (45).

⁷ Bartlett (9).

⁸ Spencer (41).

⁹ Unpublished data compiled by Leland Spencer, Cornell University.

that a consolidation of their operations would have made a material reduction in cost to the remaining plant operators (tables 10 and 11). The extent of the savings is suggested by the processing cost of the three plants.

TABLE 10.—Capacity of milk processing plants in California utilized, 1942

Marketing area	Capacity utilized	Marketing area	Capacity utilized
	Percent		Percent
Utah Valley	61.5	Monterey-Watsonville	39.0
Sonoma County	24.0	Fresno	41.1
Santa Clara County	34.0	Los Angeles County	45.2
Santa Barbara	30.5	Martin County	39.7
San Joaquin County	36.4	Ventura County	36.0
San Francisco	61.7	Placer-Nevada	32.8
San Diego County	74.7	Imperial County	30.7
Sacramento	65.1	Humboldt County	33.1

MARSHALL, JOHN JR. CHANGES IN METHODS OF OPERATION OF MILK DISTRIBUTORS IN CALIFORNIA WHICH WILL CONSERVE RUBBER, AUTOMOTIVE, AND OTHER EQUIPMENT, AND REDUCE COSTS OF OPERATION. California State Department of Agriculture, Mimeograph, 1942

TABLE 11.—Capacity utilized and processing costs per quart, of 3 California milk plants, 1942

Plant	Capacity utilized	Costs per quart
	Percent	Cents
Los Angeles	80.97	1.16
San Diego	93.83	1.32
Fresno	20.93	2.16

MARSHALL, JOHN JR. CHANGES IN METHODS OF OPERATION OF MILK DISTRIBUTORS IN CALIFORNIA WHICH WILL CONSERVE RUBBER, AUTOMOTIVE, AND OTHER EQUIPMENT, AND REDUCE COSTS OF OPERATION. California State Department of Agriculture, Mimeograph, 1942

Somewhat similar findings have been reported with respect to other areas. Only a small percentage of the milk-distributing companies in Wisconsin were operating at more than 80 percent of plant capacity. For many companies, the figures were 60 percent, and a figure as low as 30 to 40 percent of capacity was not uncommon (33).

SALE AND DELIVERY OF FLUID MILK.—The usual method of distribution is delivery to homes from routes following an established schedule. Among the factors accounting for this practice are the perishability of milk, its importance in the food budget, and its bulkiness. In the smaller cities, many routes deliver to stores, restaurants, and other wholesale outlets, as well as to homes. In the larger cities, most of the wholesale business is segregated and served by special wholesale routes. Until recently, deliveries to homes were made every day. During World War II, every-other-day delivery was the general rule. Wartime regulations also limited wholesale deliveries to 6 days a week.

Home delivery from retail routes is the most important distributing channel, but sales through stores have increased. Between 1930 and 1941, sales through stores in Chicago increased from less than 25 percent to about 50 percent of total sales, and in New York City from 30 percent to 50 percent of the total.¹¹ The store system of distribu-

¹¹ HERRMANN, L. P., and WELDEN, W. C. PREWAR DEVELOPMENTS IN MILK DISTRIBUTION. Cooperative Research and Service Div., Farm Credit Admin. Misc. Rept. 62. 24 pp. November 1942. [Processed.]

tion has been encouraged by improvement in refrigeration facilities in stores, aggressive sales policies by chain-store organizations in some areas, and the development of light-weight paper containers. The long-time upward trend in store sales was reversed, temporarily at least, in a few major markets in 1943. In some markets sales through stores have not expanded because of differentials between delivered and store prices. Retail deliveries in Rochester, N. Y., for example, were 4.2 times as important as sales through stores in 1942, which was exactly the same as in 1933, 10 years earlier.¹² The proportion which sales at wholesale were of total business ranged in 1940-41 from 40 percent in Minneapolis-St. Paul to 79 percent in New Orleans (table 12).

Ordinarily, delivery service is completed by the same firm that operates the city plant. In only a few large cities are subdealers a considerable factor.

The cost of milk delivery and sale is by far the most important item of marketing costs. It varies from market to market and between retail and wholesale forms of delivery. In general, the range in costs has been brought out by selected surveys (table 13) but as different methods of cost analysis were used and as the data refer to different years, close comparisons are not warranted. Estimated costs of retail milk delivery in quart bottles ranged from 2.0 cents to 5.6 cents per quart. The cost of wholesale delivery is lower.

Payment to labor represents the major part of the costs of delivering milk. In New Jersey, wages and salaries accounted for about three-fourths of the total sales-and-delivery costs of retail routes, and about three-fifths of the total on wholesale routes (table 14).

In theory, the cost of delivering milk to consumers can be substantially reduced. Observers in all parts of the country have called attention to the great inefficiencies that seem evident in present methods of milk distribution. They have estimated the magnitude

TABLE 12.—Proportion of fluid-milk distributors' wholesale sales to total sales in selected markets, 1940-41

Market	Date	Proportion of wholesale sales to total sales
		Percent
Minneapolis-St. Paul	1940	40
St. Louis	1941, March	42
Omaha	1941, January	43
Boston	1940, December	47
Chicago	1941	50
Portland, Oregon	1941	50
Des Moines	1940, May-July	58
New York	1941	63
Los Angeles	1941, November	64
Alameda	1941, November	65
Louisville	1941, April	66
Fresno	1941, September	70
Sacramento	1941, November	72
San Francisco	1941, November	76
New Orleans	1940	79

HERMANN, L. F., and WELDON, W. C. PREWAR DEVELOPMENTS IN MILK DISTRIBUTION. Cooperative Research and Service Division, Farm Credit Administration, Misc. Repl. 62. 1942. [Processed]

¹² JOHNSON, STEWART. ROCHESTER MILK MARKETING AREA. New York State Agr. Col., Agr. Econ. Min. Bul. 446. 1943.

TABLE 13.—Distributors' costs of selling and delivering fluid milk in various markets

Market	Year	Cost per quart
<i>Cents</i>		
Boston:		
Retail ¹	1934-35	4.25
Wholesale.....		2.94
Maine (10 markets) ²	1934-36	2.48
West Virginia (67 producer-dealers) ³	1935-36	2.2
New York (92 producer-dealers) ⁴	1935-36	2.02
California:		
Retail (10 distributors) ⁵	1937	4.17
Wholesale (12 distributors) ⁶		2.35
Chicago:		
Retail ⁷	1941	5.20
Wholesale ⁸		2.34
New Jersey ⁹ :		
Retail:		
Northern.....	1941-42	6.61
Southern.....		4.23
Wholesale-Northern:		
Glass.....		3.07
Paper.....	1.85	
New York City ⁴ :		
Retail:		
1-quart glass.....	1944	6.15
2-quart glass.....		5.75
Stores--1 quart glass.....		2.10

¹ Massachusetts Milk Control Board (10).

² Dow (11).

³ Herrmann (15).

⁴ Hughes (10).

⁵ Tinley (45).

⁶ Bartlett (2).

⁷ Spencer (14).

⁸ Unpublished data compiled by Leland Spencer, Cornell University.

of the savings in delivery cost which would follow if these features were eliminated.

The cost of labor, because of its relative importance, comes in for first consideration. It appears that the problem of reducing cost at this point is not only one of enabling more quarts of milk to be delivered per hour of work, but also embraces the more difficult and controversial one of enabling more quarts of milk to be delivered for each dollar spent for labor. Clearly, where routemen continue to be paid on a straight commission basis the economies resulting from an increase in the efficiency of milk delivery will be limited mainly to savings in truck-operating costs.

Estimates have also been prepared to show the savings that would accompany various assumed changes in the delivery system. The magnitude of these assumed savings obviously depends upon the degree to which the delivery system would be reorganized. Alternate-day delivery of milk and the elimination of special deliveries, it is held, could reduce the daily miles traveled in the New England area by 40 percent, with the attending savings estimated at about 0.4 cent per quart (8).

More drastic are those suggestions which call for an allocation of the market. The result of such proposals would be to give exclusive control of a particular territory to a limited number of distributors.¹³

Possible savings from adjustments of this kind become very large in terms of miles traveled, but the actual savings in total cost will depend chiefly on milk consumption in the area. In a sparsely

¹³ For a description of how this type of program has operated in England see: New England Research Council on Marketing and Food Supply, and others (23)

settled area where there are relatively few distributors, the savings from exclusive territories would be unimportant. On the other hand, when consumption is more highly concentrated there is a greater duplication of service, and hence an enlarged opportunity for savings from the assignment of exclusive territories. Yet the proponents of reorganization admit that a successful outcome hinges on control of the cost of labor and profits.

A much more complete reorganization of the industry is contemplated by proponents of the plan to operate the milk-delivery system as a public utility. Potential savings to individual firms have been estimated in the neighborhood of 2 cents per quart [33; 36; 32; 35]. Still another proposal leading to a lowering of the costs of milk delivery to individual concerns is to reduce the amount and the kind of services now furnished to consumers. Such changes as alternate-day delivery, or the elimination of home delivery, have been suggested. Some adjustments of this kind, it is said, promise monetary savings with only a small reduction in the amount of consumer service. Alternate-day delivery probably falls in this class.¹¹

It is evident that a reorganization of wholesale as well as retail routes would bring savings. It is not unusual in some cities for two or more dealers to supply milk to the same store. During January 1943, it was found that 8 out of 10 stores in New York City were obtaining milk from 2 or more dealers and 1 out of 2 stores got supplies from 3 or more dealers. A reduction in the number of firms serving any particular store could lead, it is claimed, to a substantial decline in the cost of operating vehicles, since this cost represents 16 percent of the total retail sale-and-delivery cost, and 21 percent of the wholesale. At the same time, it must be remembered that

TABLE 14.—*Selling and delivery costs by type of expense, fluid milk—New Jersey, 1941-42*

Type of expense	Percentage of total		
	Northern New Jersey		Southern New Jersey
	Retail and mixed routes, family trade	Wholesale routes	Retail and mixed routes, family trade
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Labor.....	74.1	61.3	73.8
Power and lee	1.1	3.0	1.8
Vehicle expense	13.1	9.3	11.4
Property expense	2.9	10.2	5.6
Office expense .....	.7	1.0	.6
Advertising.....	1.0	3.5	3.1
Bad debts .....	.5	1.1	1.7
Miscellaneous expenses	5.7	10.0	2.0
Total	100.0	100.0	100.0
Cost per quart	<i>Dollars</i> 0.0661	<i>Dollars</i> 0.0307	<i>Dollars</i> 0.0433

Spencer (44).

¹¹ KETTELLE, D. J., and TENNANT, J. L. EVERY OTHER DAY DELIVERY OF MILK. Rhode Island Agr. Expt. Sta., December 1942. [Processed.]

62 percent of the retail and 42 percent of the wholesale sale-and-delivery costs were made up of payments to labor.

Labor cost is an important item in the total cost of delivering milk. Depending upon the market and the distributor, the method of payment to labor varies all the way from an hourly wage to straight commission. During 1941, small distributors in the minor markets of Connecticut paid a weekly salary which ranged from \$25 to \$43. In the major markets, in contrast, large dealers indicated that their wage contracts applicable to retail routemen either provide for a commission on collections or for a combination of commission and salary. Straight commissions usually were 12½ percent; combined salary-and-commission method of payment amounted to about \$11 per week plus 10 percent of the collections (8). In Chicago, during the year 1941-42, the annual earnings of milk drivers averaged \$2,640 with two-thirds drawing from \$2,250 to \$2,750 (49). In northern New Jersey, wages averaged \$45.18 a week, and commissions averaged \$8.33, while in the Southern New Jersey area, wages amounted to \$7.63 and commissions \$35.63 (47).

The method of paying routemen in Buffalo was changed when alternate-day delivery was introduced, so that the standard base pay made up a large part of drivers' earnings. This resulted in considerable savings. In Syracuse, labor insisted on retaining the straight commission method of settlement, with the result that alternate-day delivery not only increased drivers' hourly earnings but also prevented reduction in the labor cost of delivering milk.

In addition to the adjustments just mentioned, which are designed to reduce costs, several minor changes have been proposed with respect to milk-delivery practices. These include a price inducement for quantity purchases by household consumers, the use of helpers on milk routes that serve intensive sales areas, and a simplification of lines including a reduction in the number of products handled, in types of bottle closures, and in number of container sizes. These proposals also call for an increase in the use of multiple-quart containers and paper bottles.

MARKETING MARGINS AND COSTS FOR BUTTER

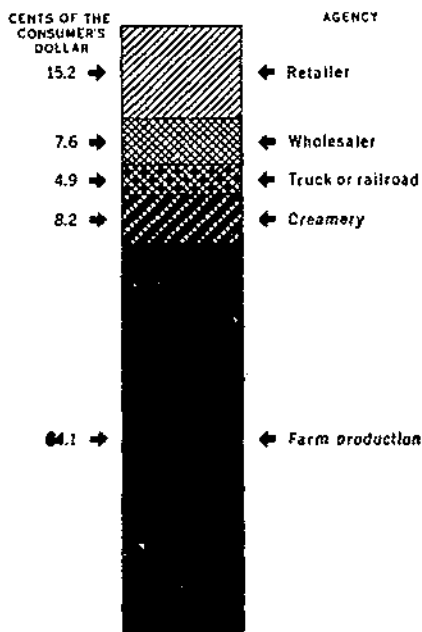
Consumers in the United States paid an average price of 31.1 cents a pound for the butter they bought in 1939. At the same time, for the equivalent quantity of farm produce, the dairyman received about 20 cents. The difference, or 11.1 cents, is the total gross margin per pound taken in the course of assembling, processing, and distributing all butter during 1939. This margin will be divided into its several parts and viewed in some detail. These details will present the evidence considered in arriving at the estimated share of the various claimants and will provide a basis on which to form judgments concerning possible reductions in the size of the marketing margin.

It is well in the beginning to note that merchandising demands only a part of this margin of 11.1 cents, for out of it must be paid approximately 2.6 cents for processing, 1.0 cents for such material as salt and containers, and perhaps as much as 1.25 cents for trans-

portation charges of different kinds. In all, these add up to 4.8 cents for each pound of butter, leaving 6.3 cents as the gross returns available to merchants and shopkeepers.

This marketing margin of 11.1 cents is equivalent to one-third of each dollar spent by consumers for butter. The remaining two-thirds are paid to farmers. The course of the marketing margin for other years is shown in figure 3, (p. 6).

The marketing margin for butter is relatively small both when compared with that applicable to other dairy products and when contrasted with that characteristic of other food products. The smallness of the margin is traceable to several characteristics of the product.



BAE 45017

FIGURE 11.—Approximate distribution of the consumer's dollar spent for butter manufactured in Iowa and sold in New York City, 1910.

Among them are relatively simple processing, a rapid turn-over of stocks, a comparatively high value associated with small bulk, and convenient packaging for handling (50).

A further sharpening of perspective on the matter of butter margins may be obtained by looking first at what may be called a typical instance. The share of each agency which contributes to the movement of butter through this particular channel is shown in table 15, as well as in figure 11.

In this instance, dairymen are shown as receiving 21.1 cents and consumers as paying 32.9 cents, with a resulting margin of 11.8 cents per pound. All of these figures are slightly above those that will be used later to represent nationwide averages for 1939.

TABLE 15.—Estimated share of the consumer's dollar paid for butter manufactured in Iowa and sold in New York City, 1940

Agency	Price per pound	Percentage of retail price
	<i>Cents</i>	<i>Percent</i>
Retailers.....	3.0	18.2
Wholesalers (including printing).....	2.5	7.6
Transportation (long haul).....	1.0	4.9
Creameries.....	2.7	8.2
Farmers.....	21.1	64.1
Retail price.....	32.9	100.0

Unpublished data from Farm Credit Administration.

MARKETING CHANNELS

There are many other combinations of outlets in addition to this "regular" producer-creamery-wholesaler-retailer arrangement. Some of these are portrayed in figure 12, though the arrangement makes no

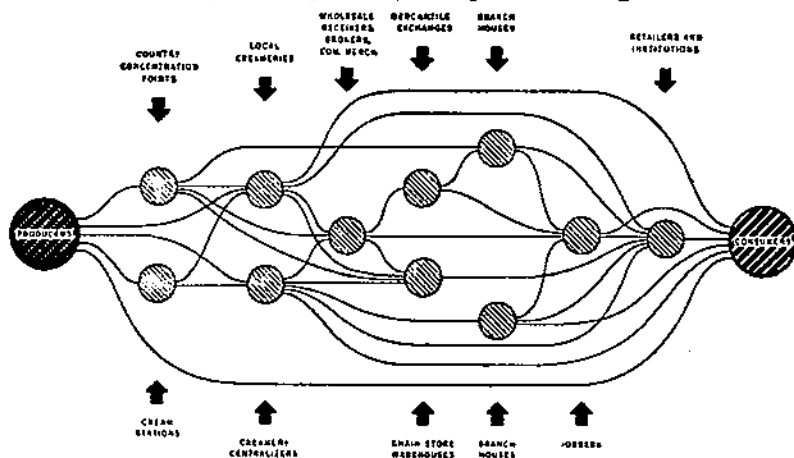


FIGURE 12.—Some typical examples of marketing channels for butter.

BAE 4501

pretense of exhausting the list. In emphasizing the numerous routes over which butter flows, the chart may be misleading. Over many of these paths the volume is small. Moreover, some of them represent the performance at a country point of a portion of the functions previously carried on at terminal markets. Concentration of butter at the country point is an example. Others represent arrangements that may be highly desirable in the case of one firm or one segment of the butter trade but not at all promising for another part. For example, there are instances in which retail merchants handle sufficient volume to be able to operate a creamery, but there are many more who do not. Not a few of the instances, where a flow between two agencies is shown in both directions, arise because one dealer finds his supply a little too large and another finds that his is short of immediate needs.

For a proper view of the importance of each of these outlets and routings it is necessary to know the volume involved in each case

during the year 1939. Although figure 13 aims to show this, the data for each of the many outlets are not available, and thus this flow chart falls somewhat short of picturing the true situation.

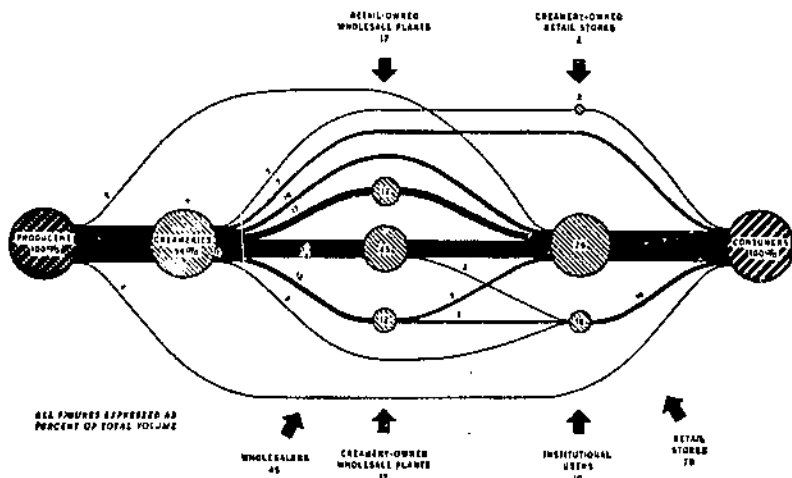


FIGURE 13.—Marketing channels for butter, United States, 1939. BAE 4588

VOLUME.—In the times when producers and consumers were usually neighbors, the dairyman not only produced the butterfat but he churned and delivered the butter, either to the consumers' doors or to a local store. Obviously, this is no longer possible on any large scale. Nonetheless, as much as 4 percent of the total butter production of 1939 moved into consumers' hands in this way. The other 96 percent was churned by creameries.

These creameries, in turn, sold about 9 percent of the total butter produced in 1939 to household consumers. A little less than one-fourth of this quantity passed through creamery-owned retail stores. Nearly 5,000 creameries were reporting butter production in 1939, so these could have been an important source of supply for not a few communities. Another kind of direct sale by creameries, amounting to 3 percent of the total, is to industrial and institutional users, such as manufacturers, railroad commissaries, schools, hospitals, and restaurants. At the same time 57 percent of the total production went through the "regular" channel—to wholesalers—and there should be added another 17 percent, to include that part of the creameries' sales to retail stores which, in fact, passed through the retailers' warehouses and thus represented a wholesaler type of transaction. Accordingly there remains, out of the total production, approximately 10 percent as the quantity that creameries sold directly to retail stores other than those owned by the creamery.

Practically all the butter that passed through the hands of wholesalers in 1939 was sold by them to retail stores; the small remaining part was bought by institutional users.

Not shown on the flow chart is the part played by brokers, agents, and commission merchants who do not take title to the butter but serve only to bring together sellers and buyers. Many years ago

commission sales were common; now such sales are the exception rather than the rule. Yet this group of agents handled in 1939 about 10 percent of the total volume (47, p. 28).

WHOLESALESAERS.—Both flow charts, in providing only one category for wholesalers of all kinds, conceal much of the detailed operations of this important segment of the marketing chain. Fortunately, it is possible to fill in some of the missing parts. The wholesale trades in which butter sales were of some importance, the 1939 Census of Business reveals, were the dairy-and-poultry-products trade, the dairy-products trade, and the meat-and-provisions (manufacturers' sales branches) trade. The channels of distribution used by each of these trades are shown in table 16, but these data relate to all sales—not to butter alone. There is a difference between trades in the importance

TABLE 16.—Sales of service and limited-function wholesalers, by classes of customers

Trade	Percentage of total sales to—				
	Other whole-salers	Institu-tions	Retailers	Household consumers	Others
	Percent	Percent	Percent	Percent	Percent
Dairy and poultry products	23.0	11.0	64.1	1.5	0.4
Dairy products	18.7	5.6	45.5	9.9	.3
Meats and provisions.....	(1)	9.2	83.9	(1)	(1)

¹ Not available.

Census of Business. Wholesale Trade, 1939, vol. II. (48, p. 125).

attached to various types of buyers. In two of the three trade groups, wholesalers' sales to other wholesalers amount to about 20 percent of their total sales. Such sales may be thought to reflect primarily sales made to jobbers. The meat-and-provisions trade, in contrast, sells little to other wholesalers for it places more than four-fifths of its output directly into the hands of retailers, by operating routes to serve retail stores. In none of these trades do sales to institutions amount to more than 12 percent.

The data in table 16 give a general picture of the proportion of butter sold by the wholesale trade to the principal types of buyers. It is possible, in addition, to show specifically how four groups of selected wholesale firms have been directing their sales of butter. The data shown in table 17 are for selected companies; although they cannot profess to represent the picture for all wholesalers, the combined sales of these concerns reach approximately 60 percent of the total butter produced during the years to which the data apply. Several observations seem to follow from the table:

- (1) Wholesale grocers do not appear to be a large factor in the butter trade. Retailers look to the more specialized handlers for this part of their purchases.
- (2) Sales to wholesalers other than wholesale grocers are not emphasized by the meat packers or the producer cooperatives, yet they make up a little more than one-fourth of the total sales of the dairy companies and the wholesale butter distributors.
- (3) Sales to retailers are of major importance to meat packers and the producer cooperatives. They are less emphasized by butter

distributors, although they still comprise the largest single outlet, and they account for about one-third of the sales of the dairy companies. To be noted is the difference between these four groups in the proportion of sales made to chain retailers and to independent retailers. The meat packers serve the independents, primarily. The dairy companies serve both independents and the chains. The sales of the other two groups, although leaning in favor of the chains, are divided more nearly evenly between the two types of retail organization.

TABLE 17.—Butter sales of selected-wholesale concerns, by types of purchasers, 1934-35

Purchaser	14 wholesale butter dis- tributors ¹	10 meat packing concerns ²	12 dairy companies ³	8 producer cooperatives ⁴
	Percent	Percent	Percent	Percent
Wholesalers:				
Grocers.....	5.06	6.10	1.46	
Others ⁵	27.02	2.99	26.91	0.47
Chain stores.....	23.03	9.91	23.42	46.50
Independent retail stores.....	17.06	72.88	3.01	
Institutions and manufacturers.....	18.00	5.26		6.14
Others:				
Route customers ⁶		2.55	35.65	31.00
Not specified.....	.5	4.13	3.34	5.0
Mercantile exchanges.....			2.24	
Government.....	7.97	2.09	.97	.8
Total.....	100.00	100.00	100.00	100.00

¹ Includes the following companies and their domestic subsidiaries: Carl Ahlers, Inc.; Bennett & Layton, Inc.; G. H. Weaver & Co.; Empire Produce Co.; Gude Bros.; Keiffer & Co.; Hunter-Walton & Co.; Jerro Commission Co., Inc.; Kuhner Packing Co.; Scherber & Co., Inc.; Lewis-Mears Co.; Miles Friedman Inc.; Peter Fox Sons Co.; The Wheeler Corporation, and Zenith-Gridley Co., Inc. Their combined volume was 145.7 million pounds.

² Includes the following companies and their domestic subsidiaries: Swift & Co.; Armour & Co.; Wilson & Co., Inc.; the Cudahy Packing Co.; John Morrell & Co.; and Kingan & Co., Inc. The combined sales of these companies was 317.1 million pounds.

³ Includes the following companies and their subsidiaries: National Dairy Products Corp., the Borden Co., Beatrice Creamery Co., the Fairmont Creamery Co.; Carnation Co.; Pet Milk Co.; Golden State Co., Ltd.; Western Dairies, Inc.; Creameries of America, Inc.; American Dairies, Inc.; North American Creameries, Inc.; and the Great Atlantic and Pacific Tea Co. The combined butter sales of these amounted to 431.5 million pounds.

⁴ Includes the butter sales of the following associations: Dairymen's League Cooperative Association, Inc.; New England Dairies, Inc.; Twin City Milk Producers Association, Inc.; Consolidated Dairy Products Co.; Challenge Cream and Butter Association; Land O'Lakes Creameries, Inc.; La Valle Cooperative Creamery Co.; and Iowa State Brand Creameries, Inc. The combined butter sales of these companies amounted to 151.7 million pounds.

⁵ Includes brokers and commission houses.

⁶ Includes route sales to homes and institutional users and, in the case of the producer cooperatives, to retail stores other than chains.

Federal Trade Commission (57). Adapted from tables 306, 312, and 321.

(4) The position of sales to institutions cannot be made out clearly in the case of the dairy companies and the producer cooperatives, for under the "others" heading is included a volume of sales that undoubtedly is made to institutions but could not be segregated. In both instances this volume is undoubtedly larger than that shown. Institutions form one of the more important outlets for the wholesale butter distributors.

(5) Sales on the mercantile exchange are reported only by the dairy concerns and in a volume equal to about 2 percent of their total butter sales. They may have been included in the "others" classification by the other firms and thus become lost from sight. In any event, the volume seems to be very small.

This then is the way the operation works out at the wholesale point in the marketing channel for butter. It is to be remembered that firms of this kind operate mainly in the larger urban areas and that

some 30 percent of the total butter is not handled by them. This intricacy of marketing pattern is not characteristic of all butter.

Additional light is thrown on the flow of butter through wholesale channels when it is learned where these concerns bought their butter. Once again the exchange between wholesalers is clearly evident (table 18). In two instances such transactions constitute between 15 to 20 percent of the total. There is surprising variation in the relative quantities bought direct from creameries as well as in the relative dealings with brokers and commission houses.

The business of these selected firms, as pictured by tables 18 and 19, illustrates the highly flexible nature of the marketing arrangements for butter among wholesale traders which, in part, explains why the marketing margin is relatively small.

TABLE 18.—Purchases of butter by selected wholesalers, by source of supply, 1934-35

Source of supply	4 cooperative milk and milk products associations	11 milk and milk products companies	10 meat packing companies	14 wholesale butter distributors
	Percent	Percent	Percent	Percent
Other wholesalers.....	5.81	10.10	1.28	18.30
Brokers and commission houses.....	2.40	26.05	11.69	9.07
Others.....	.45	1.75	.....	2.48
Creameries.....	90.70	20.30	71.35	69.46
Marketing cooperatives.....	.61	32.75	15.68	1.79
Total.....	100.00	100.00	100.00	100.00

¹ 3.63 percent bought from chain grocery-store companies.

Federal Trade Commission (67). Adapted from tables 306, 312, and 321.

IMPORTANCE OF BUTTER SALES TO VARIOUS HANDLERS

The importance of butter sales in the total business operations of the various agencies is not the same. Differences begin to make their appearance at the farms. Some farmers are mainly dairymen. For others, dairying is merely a sideline.

Another distinction is drawn along geographical lines. Some centers concentrate on milk production, whereas in some other much larger areas cream accumulates only in small quantities daily. Differences such as these may have far-reaching consequences, for they shape the volume of milk to be handled, affect its quality, and in many other ways influence the processing and marketing of butter and place definite restrictions upon the cost-saving changes that can be made.

With few exceptions, creameries are specialized butter producers. Most of them make butter and little else. Nevertheless there are areas where, seasonally, milk production exceeds the needs of the fluid market, and this surplus may be converted into butter. Here butter is an incidental product.

There are areas, notably in Wisconsin and the Pacific Coast States, where plants are so equipped that milk may be directed to any one or to a number of products. Butter is one of them. In plants of this kind whole milk must be received from the farmers and this milk must be of such freshness and quality that it is suitable for all uses. Even if such flexible plants invariably could make savings, a general use of them would have to wait upon, and be limited by, the production in large volume of quality milk.

TABLE 19.—Sales of butter and cheese, by types of wholesalers' trade, 1939

Trade	Percentage butter and cheese sales are of total sales by—		Trade	Percentage butter and cheese sales are of total sales by—	
	Firms handling	All firms in the trade		Firms handling	All firms in the trade
Service and limited function wholesalers:			Service and limited function wholesalers—Continued		
Farm consumer goods:			Retailer-cooperative warehouses	Per-cent	Per-cent
Dairy and poultry products	51.4	49.9	Groceries (specialty lines):	8.1	3.0
Dairy products	43.5	27.1	Canned foods	10.2	.8
Poultry and poultry products	5.2	.4	Flour	11.4	.1
Fresh fruits and vegetables	2.1	.1	Meats and provisions	6.4	1.2
Other	46.2	15.8	Other	20.4	3.0
Groceries (general line):			Manufacturers sales branches (with stocks):		
Grocer wholesalers	2.1	.8	Specialty foods:		
Voluntary group wholesalers	1.7	.7	Canned food	16.2	3.6
			Meat and provisions	8.3	7.8
			Other	10.9	.1

Census of Business, Wholesale Trade, 1939, vol. II (48, table 8.4).

All told, most creameries have to depend solely upon butter to pay their cost of operation, and so creamery costs and the factors which affect them can be observed, with some degree of precision.

In contrast, the cost picture becomes increasingly more difficult to make out in the case of those marketing agencies located closer to the consumers, because of the greatly increased number of items they customarily sell. As the number increases, butter contributes a decreasing part of the total sales.

The Census of Business of 1939 has compiled figures showing the relative importance of selected commodities to the total sales made by various kinds of wholesale trades. These tabulations bracket butter and cheese together, but the combined figures reproduced in table 19 will serve to mark out the maximum proportion that butter could be of the total sales of each group of wholesale merchants.¹⁵ The generally small contribution that butter and cheese make to the total sales of wholesalers is noteworthy. Yet two trades report an important volume of butter and cheese—these are the dairy-products trade and the dairy- and poultry-products trade. Probably all of the specialized butter handlers are found in these two trades. Of the firms included within the dairy- and poultry-products trade and the dairy-products trade that handle butter and cheese, nearly half of the total sales during 1939 consisted of these two commodities. But not all firms within the trade stocked these items. Therefore, the proportion of the butter and cheese sales to the total sales by all members of the trade are slightly smaller in the case of the dairy and poultry trade, and considerably smaller in the case of the dairy-products trade.

The small importance of the butter and cheese sold by general-line wholesale grocers is to be noted. Their sales of these two products

¹⁵ Consumption of butter is about three times that of cheese, though it cannot be assumed that the sales of these concerns were divided in this manner. United States Department of Agriculture (51).

is small both in terms of the sales of those who stock butter and in terms of the trade as a whole. In the case of manufacturers' sales branches, operated by the meat and provision trade, butter and cheese contribute about 8 percent of their total sales. This trade is said to be a substantial factor in the butter market. A considerable number of the trades listed in table 19 show rather substantial sales of butter and cheese but because so few concerns handle these products their importance to the trade as a whole is minor.

There are no similar data for retail merchants, but the situation in regard to them may be expected to be essentially the same. There are retailers who specialize in dairy products (but seldom, if ever, is there an exclusive butter store) and for these stores the contribution of butter to total sales may be expected to be somewhere in the neighborhood of the 30 to 50 percent shown for the two specialized wholesale trades just mentioned.

But a difference is to be expected. As butter is regularly needed by consumers, it is likely to be stocked by almost every food retailer. Accordingly, while the portion of the total sales that is contributed by butter may be expected to fall within the range of 5 to 10 percent, the proportion of butter to the total sales of all food retailers will not fall off sharply from this level. It did decline sharply in this respect in the case of most segments of the wholesale food trade.

In short, with respect to both wholesalers and retailers, butter turns out to be just one of many items stocked. At the same time, the store-wide costs of operation of both retailers and wholesalers are the result of their entire operation. One commodity may contribute more than its proportionate share of that total cost, and another less, but the store-wide costs are the result of a balancing out of these commodity contributions. A change downward in one margin usually will call for an offsetting rise in the margin on some other commodity. There is no net gain in this sort of change, although a particular commodity may benefit from it.

DIVISION OF THE CONSUMER'S DOLLAR

Up to this point the objectives have been twofold: to determine what were the butter-marketing channels in 1939 and to arrive at a measure of the importance of each channel in terms of the butter traffic handled during that year. One routing—through the creamery-wholesale-retailer—was found to be of major importance. Yet there were others. Now all routings are combined in such a way as to yield a composite picture of the 1939 margins taken on all butter, wherever produced and however marketed.

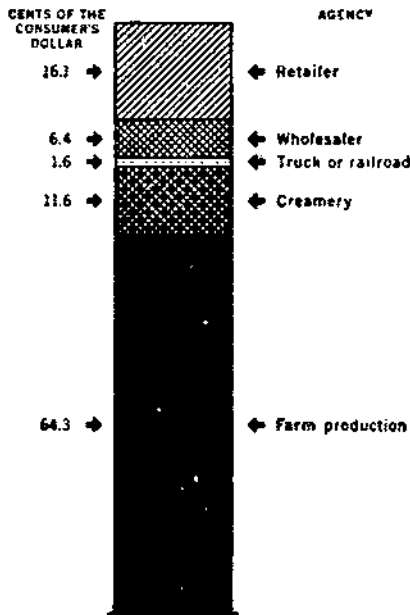
For this purpose, estimates are needed of the relative volume moving through each marketing channel. These are recorded in figure 13. Then estimates are needed of the gross margin per pound of butter in 1939 taken by creameries, transportation agencies for long hauls, wholesalers, and retailers.¹⁰

With such materials at hand it is possible to make three estimates applicable to the year 1939. The first will show the gross margin

¹⁰ In the order named, the appropriate estimates per pound of butter, which are developed elsewhere are 4.2 cents, 0.5 cents, 2.4 cents, and 4.0 cents. These gross margins are equivalent, respectively, to 17 percent, 2 percent, 8.8 percent, and 12.9 percent of the sales value of butter at the time the charges are applicable.

taken by each agency, the second will disclose the gross margin claimed for each of the marketing functions, and the last will divide the total gross margin of all agencies into various types of expense.

SHARES BY MARKETING AGENCIES.—The margins taken by the several agencies recorded in figure 14, reflect the sales made to all types of customers by the members of each agency group.



DAE 4589

FIGURE 14.—Approximate distribution of the consumers' dollar spent for butter, by agencies, 1939.

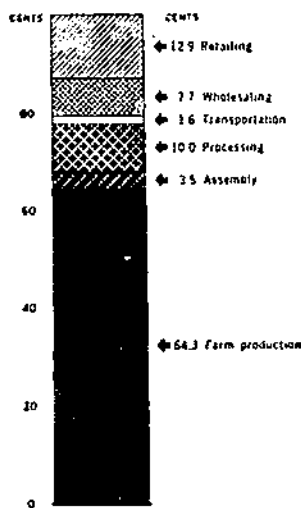
It is a matter of common knowledge that the prices paid by various customers differ and one of the reasons for a branching out from "regular" channels is to seize one or more of those advantageous price situations. For example, it appears that creameries, when all types of sales are lumped together, are able on the average to get about 1 cent more per pound of butter than if they had sold exclusively to wholesalers. However, increased costs accompany the increased returns.

Total transportation charges of butter for long hauls, when prorated against all butter, are estimated to comprise about $\frac{1}{2}$ cent a pound or 1.6 cents out of the consumer's butter dollar. This charge is small because, for a substantial volume of the total butter sold in the United States, no long-haul transportation charges are applicable. For all class I railroads the average revenue in 1939 derived from butter amounted to about 0.9 cent per pound (52). About three-fourths of this represents long haul, paid by the creamery. The remainder represents short-haul charges paid by subsequent butter handlers and appearing as one of their costs of doing business. Moreover, about 10 percent of the total production was transported by

trucks to the four major markets. The charges for this movement are assumed to be not greatly different from the charges by rail. Charges for icing, which have been included in the $\frac{1}{2}$ -cent transportation fee, are estimated at 0.04 cent per pound for the year covered.

The wholesalers' margin in 1939 when computed on the basis of all butter marketed, is estimated at 2.0 cents per pound. The margin of retailers, including institutions, amounts to 5.0 cents per pound. Farmers' returns from outlets other than the creameries are already reflected in the price they received.

SHARES BY FUNCTIONS.—The estimated division of the 1939 gross margin according to functions is shown in figure 15.



GAE 45605

FIGURE 15.—Approximate distribution of the consumer's dollar spent for butter, by functions, United States, 1939.

Milk must be assembled from countless farms before creameries can begin to operate. Sometimes the farmer himself brings his product to the creamery, sometimes a trucker assumes this chore for several farmers. Either plan is feasible only in those areas in which milk production is of some importance and the hauling distance is relatively short. Other arrangements are necessary when farms are scattered and milk production per square mile is small. In these instances, the farmer may ship by common carrier, or local cream stations may provide the gathering point for the commodity. The farmer, as a rule, must get back his own hauling costs from the price paid by the creamery when he brings his product to the creamery door. The same would be true if the farmer paid the charges levied by transportation agencies. If all farmers had paid the cost of local hauling in 1939, no assembling costs would be shown in the present calculations, for these are intended to show only the actual charges paid by processing or marketing agencies during that year.

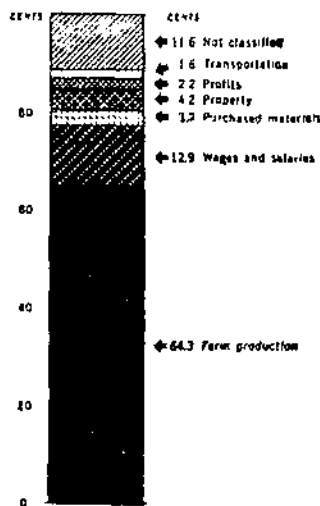
Some creameries pay a part of the gathering charges. The wider the territory over which a creamery assembles its raw material, the larger will be its assembling costs. Creameries that gather from a

wide area are known as centralizers and their part of the total production of butter is estimated to be a little less than 30 percent, with charges for both transportation and cream-station operations estimated at 2.4 cents per pound of butter. Moreover, for a volume nearly as large a charge of about 1.5 cents is assumed by the creamery as inbound expense borne by it. In all, as a very rough approximation, 1.1 cents is set down as representing the country assembling charges.

So the first of the marketing functions for butter claims about 3.5 percent of the consumer's dollar. Next comes processing which, in the present classification, includes all of the tasks performed at the creamery, not only the technical work coming before and after churning but also packing, temporary storage, local drayage, and selling. A charge of 3.1 cents per pound of butter is estimated as the cost of processing, which equals 10 percent of the consumer's dollar.

For retail and wholesale distribution--which involves receiving, handling, storing, selling, local transportation, financing, and a host of other tasks the total charge in 1939 is estimated to have been 6.4 cents per pound of butter or 20.6 percent of the total.

SHARES BY EXPENSE ITEMS. The final rearrangement of the shares is made to bring out type of expense (fig. 16). The largest item



DAE 4585

FIGURE 16. Approximate distribution of the consumer's dollar spent for butter, by type of expense, United States, 1939.

except for the cost of butterfat is for wages and salaries. This item amounts to 4.0 cents per pound of butter and 12.9 percent of the consumer's dollar, but in terms of the gross marketing margin of 11.1 cents wages and salaries make up more than a third of the total. Property expense which embraces such items as taxes, depreciation, repairs, rent, but not the cost of storage in public warehouses--amounts to 1.3 cents per pound of butter or 4.2 cents on the dollar. For packages, salt, coloring, acid, starters, and neutralizers, the total

expenditure is estimated at 1.0 cents a pound for all butter. The details for other and much smaller items are not shown in the chart.

The item designated "not classified" is of sufficient size to suggest that not all of the expenditures which should have been included under one of the other expense groups have been so included. To the extent of these omissions, these expense estimates must be considered as conservative.

ANALYSIS OF MARGINS

The marketing margin for butter in 1939 was small compared with the margin for many other agricultural commodities. Moreover, since 1931 these prewar margins, as reflected by the spread between retail and farm prices, have changed but little from the 11.1 cents margin applicable in 1939 (fig. 3). Yet in the preceding decade the margin centered at about 15.5 cents, which implies that a substantial reduction in costs has taken place within the 20-year period. This may be the case, yet in the earlier decade the level of retail prices was about 50 cents a pound for butter while during the 10 years that followed the level rested in the neighborhood of 35 cents.

It is to be expected that marketing and processing costs, when the level of prices for all goods is high, will exceed those that apply at a lower price level. It is this adjustment in price level which explains, in part, the changes in the butter margin. At the higher level of prices prevailing during the decade of the 1920's most expenses were higher. Some indication of the modifications that took place with the coming of the lower price level is illustrated by changes in creamery costs of several cooperative creameries (table 20). From 1929, when

TABLE 20. Operating expenses per pound of butterfat of creameries at different price levels, 1929 and 1934.

Type of expense	1929 high prices	1934 low prices
	Cents	Cents
Labor and salaries	1.44	.90
Materials	1.19	.86
Other manufacturing	.72	.66
Interest, taxes, insurance, etc.	.37	.25
Total	3.72	2.68

Mortenson (71, p. 23).

all prices were high, to the extremely low prices of 1933, creamery costs, in all, fell about 30 percent. All expenses declined but those for wages and salaries underwent an especially sharp adjustment.

It appears that the course of butter margins during the years to come will be closely bound up with the course taken by the several kinds of expense items, particularly wages and salaries. But margins are complex things. They are partly the result of the unit costs of things bought and partly the result of the efficiency with which all activities are carried on. It remains to be seen whether increased efficiency can offset increased cost rates for things bought, and the smaller margins of the decade of the 1930's can be maintained in the face of rising price levels.

As a final step, there remains the task of seeing in what way butter margins may be reduced.

ASSEMBLING.—The costs of assembling are the expenses associated with gathering cream or milk from producers. It would appear that these expenditures—at least the portion of them included in the marketing margin—have increased within the last 20 years. This is the result of the growing tendency of local creameries to pay a part or all of the inbound costs, whereas previously the farmers absorbed the cost.

But the practice is not common everywhere. Minnesota and Wisconsin, for example, still adhere mainly to the rule of charging the farmers, whereas in Michigan creameries pay all charges. This is the practice of centralizers, too, especially if they operate cream stations. All told, this appears to be one of the marketing arrangements that is undergoing considerable change.

The logic of designating one trucker to haul the cream of several farmers instead of having each farmer haul his own, is unassailable. Under this plan, savings in time, gas, tires, and machinery seem to be inevitable. One truck could pass at an appointed hour, picking up all cans deposited by the farmers at the roadside and awaiting delivery, and could proceed directly to the one creamery that serves the community. At present, creamery territories usually overlap, local creameries compete with each other for supply, and the large creamery drawing from a wide area competes with them all. How widespread is this competition may be seen from table 21. The objective of all creameries is practically the same—a maintained volume with its associated lower cost. So truck routes have come to take on competitive characteristics. Truckers are paid not only to haul but also

TABLE 21.—*Cooperative creameries reporting competing butterfat buyers within specified distances*

Location and number of competing buyers	Percentage of creameries reporting competition					
	Cooperatives	Independents	Cream stations	Centralizers	Ice cream and milk bottling plants	Cheese factories
	Percent	Percent	Percent	Percent	Percent	Percent
In same town:						
None	100	92	51	98	95	99
1		6	20	2	2	1
2		2	13		1	
3			7		1	
4 and over			6		1	
Within 5-mile radius:						
None	68	86	44	97	93	97
1-2	31	14	37	3	5	2
3-4	1		14		1	1
5-6			5		1	
Within 10-mile radius:						
None	44	68	19	94	90	94
1-2	31	36	30	6	8	5
3-4	30	6	16		1	
5-6	20		6		1	
7 and over	5		2			
Within 15-mile radius:						
None	5	39	39	85	88	88
1-2	13	48	35	14	10	10
3-4	30	12	17		1	1
5-6	26	1	7	1	1	
7 and over	20		2			1

Kollar and Jenness (19, p. 52).

to bring business into their creamery. That is one reason why more trucks are used than are necessary to do the hauling.

At some time a complete reorganization of the creamery structure of the country might be possible, with consequent savings. But until this time comes, it is necessary to see what can be done with the situation as it now exists.

High costs of assembly seem to be associated with certain factors; a correction of these factors promises some relief. The first of these concerns the motortruck itself. A truck should be of proper size, and should be efficiently maintained and operated. Volume purchases of trucks, supplies, and services by truck operators would bring savings in the form of lower unit costs. Much more important, however, is a rearrangement of routes to reduce the mileage travel and to insure full loads. Investigations have shown that trucks are not fully loaded, that routes commonly overlap, that excessive time is spent in rendering special services to patrons, and that routes are much longer than full efficiency would indicate to be desirable. Apparently some improvements could be made in the case of trucks that service individual creameries in spite of the competitive characteristics of truck routes generally.

Where milk production is highly concentrated both of these results can be obtained much more readily than where production is small and producers are widely separated. Roads, too, have a bearing on operating cost, the country dirt road presenting a high-cost operating problem of no small consequence (39, p. 60ff.).

Fortunately, roads are being improved all the time, and this will be increasingly the case now that the war is over.

PROCESSING. - The next step in the flow of butter from the dairymen to consumers is represented by manufacturing, where skill is required to turn out a good product and to get maximum yields. As the ability of butter makers varies in both respects, there are technical savings still to be earned. This is a field to which some agricultural experiment stations have devoted much attention, and it may be assumed that the possible future savings in costs that can be made at the churn will not be large in the aggregate.

Savings at the creamery must chiefly spring from better management. But the phrase "better management" is more of a slogan than a formula for procedure. Better management may embrace a great many things, ranging all the way from using the right kind of building and equipment to paying appropriate rates for labor hired and materials bought. If a creamery organization consisted of standardized units, like the parts of an automobile of popular make, it might be possible to draw up a pattern for a creamery that was guaranteed to produce with optimum efficiency. Because conditions vary from community to community optimum efficiency, in the case of creameries, must be tailored pretty much out of the materials at hand. The creamery that uses cordwood for fuel has a different operating problem from one that uses other fuels. A centralizer located in a metropolitan center is confronted with problems quite different from those of a local creamery situated at an interior crossroad. In the older producing areas, almost everywhere, operations are being carried on at locations and under conditions which were admirably suited to the dirt-road team-hauling era, now 30 years outmoded. Fortunately,

increases in milk production have taken up some of the slack that otherwise would have proved to be a heavy burden upon the cost structure. Though the number of creameries in Minnesota, for example, has not changed much since 1920, the average production per creamery has about doubled (20 p. 16).

In 1939 the average production of all factories making butter was approximately 390,000 pounds per creamery. The costs that provided the basis for the shares shown earlier, are for creameries that manufacture approximately this volume each, and the details with respect to such creameries are given in the fourth column of table 22. Once it is set up and operating, a creamery is capable of handling a range of volume. It has been amply demonstrated that it is less costly to operate at capacity than at partial capacity, no matter what the plant size; and that large plants, other things equal, have a lower cost per unit for manufacturing than do small plants. The range in per unit costs, which are associated with different levels of volume, is illustrated in this table. Between large plants that produce more than 1 million pounds of butter annually and small plants that have an output of 100,000 pounds or less, there is a difference of 2 cents, about three-fourths of which represents expenses incurred for manufacturing.

Not so evident from the table is the fact that costs fall substantially when volume increases in the very small plants, whereas savings associated with increased volume in larger creameries make their appearance much more slowly. Not shown at all in this table is the cost of assembling butterfat for the different-sized creameries, which may equalize the differences in manufacturing costs emphasized in this discussion. Clearly a creamery with a volume of a hundred thousand pounds which has no assembling costs (since they all are paid by the farmers) has a total cost that is exactly the same as the million-pound creamery which has to pay 2 cents a pound for gathering its raw material. Not at all clear is the degree to which the presence of many small creameries in the country has swollen the marketing margin for all butter. Nonetheless, were the slate wiped clean and the creameries of the country located anew, a balancing of plant costs against the cost of gathering cream might be worked out which would yield a somewhat lower share going to creameries than that which prevailed in 1939.

TABLE 22. *Costs of operation, by expense items and volume, of Minnesota creameries, 1939*

Item	Cost per pound of butter				
	Under 100,000 pounds	100,000 to 200,000 pounds	200,000 to 300,000 pounds	300,000 to 400,000 pounds	Over 1 million pounds
	Cents	Cents	Cents	Cents	Cents
Plant expense					
Labor	1.431	1.180	0.904	0.805	0.625
Other	1.274	1.044	.956	.883	.679
Total	2.705	2.224	1.860	1.719	1.294
Executive and office expense	.451	.278	.329	.241	.212
General expense	.914	.658	.805	.755	.663
Total	4.070	3.419	2.985	2.745	2.019

Cooperativa Auditing Service, Inc., Minneapolis, Minn.

Labor accounts for 30 percent of the total cost of manufacturing, but in small-volume plants it seems to run up to nearly 35 percent of the total cost. There is a difference in cost per pound of butter of about eight-tenths of a cent between the labor expenditures of the low- and high-volume creameries. But these variations in labor costs are not entirely due to volume. The quantity of butter turned out per man is involved, and this depends not only upon the ability of the employee but also upon the convenience of the plant lay-out. A plant which because of the nature of its receipts of butterfat first runs at a peak load and then stands idle for a time, seldom can make the best use of labor.

SUPPLIES.—Supplies are another considerable item of costs, amounting in all to 27 percent of the total manufacturing expense. These costs are per unit costs, however, and are not directly related to volume. Presumably, however, a large plant might be able to purchase its supplies at a lower price than a small plant. Nonetheless, through joint purchasing arrangements several small plants could accomplish much the same result. But there is difficulty in comparing the material costs of creameries for they do not all buy the same supplies. A plant that packs its butter in small consumer containers is committed to a larger cost for materials than a plant that uses tubs. Whether these additional packing activities would lift other creamery costs depends upon the situation within the creamery. Conceivably, costs would not rise if the labor used in this task otherwise would have been idle.

BUILDING AND EQUIPMENT COSTS.—Costs in connection with buildings and equipment include depreciation, insurance, repairs, and taxes or rentals and they account for another 20 percent of the total creamery costs. Combined with the two items previously listed, they make a total of 77 percent of all creamery costs. As would be expected, these fixed charges for building and equipment vary with volume. This is a cost item which should decrease substantially with volume, but it is the volume of a particular plant compared with its own capacity that is significant. The relationship is made clear in table 23, which relates the building and equipment expense per pound of butter in 1934 to the pounds of butter made per dollar of fixed assets. It is evident that there is a mounting of costs when there is a misbalance between the plant and the work it is called upon to do. A building that is much too elaborate or one built and equipped at excessive cost, in addition to all of the factors pointed out elsewhere, may mean a difference in plant costs ranging from 0.237 to 0.886 cent per pound of butter; in short, one that is nearly four times larger than the other.

Processing is one of two large functional charges which, when added together, account for nine-tenths of the producer-consumer price spread; the other is distribution. At the 1939 level of prices for labor and supplies, it would appear that a major reorganization—and it would be truly major—of the industry might reduce the share going for processing by 1 cent a pound. A reduction of one-third in the processing costs would be substantial, but as all other costs are more than twice as large as the cost of processing, the net over-all savings in margins (from a measure that must be considered extreme) would amount to only one-tenth of the present margin. In the absence of

such a general reorganization of the creamery industry, it appears that the range of possible savings would fall well within the figure of one-half cent per pound of butter.

TABLE 23.—Ratio of pounds of butter made per dollar of fixed assets in 173 creameries, 1934

Pounds of butter made per dollar of fixed assets	Creameries	Building and equipment expense per pound	Pounds of butter made per dollar of fixed assets	Creameries	Building and equipment expense per pound
Less than 8.....	Number 13	Cents 0.888	23-27.99.....	Number 21	Cents 0.301
8-12.99.....	41	.070	28-32.99.....	11	.358
13-17.99.....	41	.475	33-37.99.....	8	.280
18-22.99.....	24	.132	38 and over.....	14	.237

Koller and Josness (19, p. 59).

TRANSPORTATION.—With the coming of the motortruck and the improvement of roads, a new method of long-distance transportation was made available to creameries. It is not clear whether rates for motortrucks are higher or lower than rates for similar service provided by railroads. Trucks may provide overnight service to nearby markets and this may shorten the time between shipment and the settlement for the butter. If so, there would be some small savings in interest charges. Then, too, the use of a truck eliminates a cartage charge at both ends of the haul, and the trucker himself may help in the loading. Each of these items can bring a small saving. Shippers by rail have set up country concentration facilities where carlot quantities are assembled. As these concentration facilities may be located at stations where freight rates drop to the next lower level, a small saving in costs is afforded which may be somewhat greater than the hauling charge from the creamery to the point of shipment. But even if they are offset, there is still left the gains to be had from carlot rates which, in general, may work out to be about half those for less than carlots (38, p. 37).

A third source of savings which has been newly developed is the shipping of butter over the Great Lakes route. In 1938, 12½ million pounds of butter moved in this way at a net savings of 0.2 to 0.3 cent per pound. Two limitations restricted the traffic over this route: (1) The lakes are open only during part of the year, and (2) the inland area that can benefit is probably relatively restricted (20, p. 22).

Finally, any increases in sales by creameries in their own local communities will reduce the amount of money paid out for long-haul transportation. Some creameries are expanding the quantity of butter they sell locally but others are not much interested in this business as it involves additional time and expense, and may mean possible credit losses. Since charges for long-distance transportation are estimated at only a half cent per pound of all butter, it is evident that even though considerable savings could be made through increased sales, the net reduction in the farm retail price spread would not be large.

WHOLESALEERS.—The cost of wholesaling amounts to about 2.4 cents per pound of all butter, and a little less than 8 percent of the consumer's butter expenditure. In this discussion, all types of wholesalers have been lumped together, but if butter were to follow through regular channels there would be paid out of this wholesaler's margin one fee for the wholesale receiver and another for the jobber. A wholesale receiver buys large lots of butter, for the most part direct from creameries, and pays cash upon arrival of the lots. He grades, packs, stores, and resells in smaller quantities. A jobber, on the other hand, is primarily concerned with servicing retailers and small institutional users. Some notion of the difference in the services performed by these two members of the wholesale trade may be obtained by contrasting the distribution of the sales of meat packers with those of wholesale butter distributors (table 24).

TABLE 24.—*Distribution of operating expense as percentage of total sales by type of trade, 1939*

Trade	Total	Admini- strative	Selling	Delivery	Ware- house	Occu- pancy	Other
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Dairy and poultry products.....	8.6	2.3	1.7	1.5	1.1	1.4	0.6
Dairy products.....	21.9	3.6	4.8	0.3	2.4	3.7	1.1
Meat and provisions.....	11.4	2.7	2.6	1.8	1.3	1.9	1.1
Groceries, general line.....	9.9	2.5	2.4	1.7	1.3	1.3	.7

Census of Business, Wholesale Trade, 1939, vol. II (48, table 5).

In considering what savings can be made in wholesale costs, it should be remembered that the total margin taken by wholesale agencies is small. Evidently wholesale merchants must make their earnings by handling a large volume of business. Apparently their investment turn-over—which means cost of goods sold divided by average inventory—might be within the neighborhood of 20 times a year, which is a relatively rapid turn-over.

The Census of Business shows the operating expenses of the dairy-and poultry-products trade at about 9 percent of all sales. About half of this total margin is required for pay rolls. The change in the relative importance of each of these expense categories associated with volume of business, in the case of the dairy-and poultry-products trade, is shown in table 25. As would be expected, the concerns

TABLE 25.—*Distribution of wholesalers' expense as percentage of total sales according to volume of sales of dairy and poultry products*

Volume of sales (1,000 dollars)	Total	Admini- strative	Selling	Delivery	Ware- house	Occu- pancy	Other	Pay- roll ¹
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
100-199.....	14.7	3.7	2.7	2.8	1.2	3.5	0.8	4.9
200-299.....	11.7	3.2	2.5	2.2	1.0	2.0	.8	6.1
300-499.....	10.9	2.6	2.4	2.2	1.1	1.8	.9	6.0
500-999.....	10.9	2.9	2.2	2.2	1.4	1.5	.7	5.9
1,000 and over.....	6.2	1.7	1.3	1.0	1.0	.8	.4	5.3
Average.....	8.6	2.3	1.7	1.5	1.1	1.4	.6	4.5

¹ Included in other items.

Census of Business, Wholesale Trade, 1939, vol. II (48, table 5).

that have the smaller volume show generally higher costs, though the differences in some categories are more noticeable than in others. As both wholesale receivers and jobbers are included in this compilation, it is possible that the low-cost firms are primarily wholesale receivers and the high-cost merchants are jobbers. The relatively higher cost of the smaller firms for administration, selling, and occupancy—which is usually recognized as being associated with firms serving many small retailers—bears out this assumption.

Credit loss is one of the items that merchants are called upon to bear whereas the creameries that sell in wholesale markets generally receive cash for their products upon delivery. In the case of wholesalers, the Census reports show accounts receivable at the end of the year 1939 amounting to about 6 percent of the annual sales of dairy- and poultry-products wholesalers. In addition, wholesale receivers make advances to creameries at the time butter is shipped and pay fully for the goods upon arrival. The demands upon them for money come from both directions.

Storage is another task performed by wholesalers—performed by all to a limited extent and by a few to a very considerable degree. Consumption, month by month, proceeds apace while butter production either runs ahead or falls behind. In 1939 (table 26) butter moved into the warehouses of the four principal markets during each month of the year. The general in-movement, however, was confined to the 3 or 4 months following April, with peak holdings of 173 million pounds at the beginning of September. Cost of storage varies. A few large concerns are able to care for their own butter, but the preponderance of storage butter moves into commercial cold-storage houses located in the larger cities. Creameries, as a rule, do not hold butter any longer than necessary. Charges for storage range from 20 cents to 25 cents per hundred pounds for the first month and 12½ to 15 cents for each additional month (17, p. 759). It is estimated that the cost of commercial storage, when assessed against all butter produced in 1939 (butter stored as well as butter not stored), did not amount to more than 0.01 cent per pound. On lots of butter which were held for several months, however, the storage costs could add up to as much as 2 cents a pound. It is expected that this cost will be compensated for by a seasonal rise in price that usually makes its appearance during the fall and winter.

In addition to the specialized butter merchants, many different types of wholesalers handle butter, although in small quantities. It is generally understood that wholesalers who stock a broad line of

TABLE 26.—Cold storage movements of butter, 4 markets, 1939

Week ending	In	Out	Week ending	In	Out
	1,000 pounds	1,000 pounds		1,000 pounds	1,000 pounds
January 28	1,067	3,647	August 26	5,808	5,823
February 25	752	3,317	September 30	2,200	4,788
March 25	285	2,699	October 28	1,590	4,008
April 29	1,720	2,578	November 25	861	4,137
May 27	5,342	3,672	December 30	267	4,956
June 24	8,952	3,672			
July 29	5,049	4,100	Total 52 weeks	140,316	208,915

goods take quite dissimilar margins on individual items. But an item like butter which is sold by specialized merchants as well as by wholesalers of general lines may be expected to have its margin cut out by the force of competition. Accordingly, the butter margin of all wholesalers may be expected to be about similar to that taken by specialized butter handlers.

That is why figures for the dairy and poultry trade are used to represent for butter the general margin structure of the wholesale trade. The dairy-products trade, which handles butter along with other items, shows a gross margin of 22 percent of sales (table 24 p. 42). The meat and provision trade, on the other hand, which also handles butter, has a margin of 11.4 percent. From such data the inference may be drawn that the wholesale merchants handle butter on a wider margin than do the specialized butter handlers. This may be the case but if a handler is to price his butter competitively, his margin must be restricted to a figure not far from 9 percent, unless he can buy butter from the creamery at a price sufficiently low to permit the wider margin, or unless he has a distinctive product for which he can get a higher price. This is evident when it is noted that a 22-percent wholesale margin would be equivalent to 5.8 cents per pound of butter. Clearly, a wholesale margin of this size is not possible on any wide scale within the producer-consumer spread of 11.1 cents that applied to butter in the year 1939. Butter must be handled on a smaller margin than the average margin for all items sold in most stores.

How these relatively low margins for butter finally work out is illustrated in the case of one wholesaler's experience during one week of June 1939. This merchant's butter margin was 8.12 percent of its sale value. At the same time, his average margin on about 2,300 different items was 10.33 percent. On sugar the margin was as small as 2.96 percent of its sales value and on a selected brand of coffee it was 23.7 percent. There were only 10 commodity departments out of a total of 55 within the store that had a smaller rate of gross margin than the rate for butter. Yet even at this rate nearly 5 percent of the concern's total gross margin was contributed by butter and the commodity made up 5½ percent of the total sales. Interestingly enough, sugar, with the lowest margin rate of all, brought in 2.95 percent of the total earned margin and accounted for 10.3 percent of the total sales, whereas coffee contributed but 0.2 percent of the total gross margin earned and 0.4 percent of the total sales (29, p. 60). It is the total dollars of earned margin, not the margin rate, with which bills are paid.

A product that keeps moving is one on which small margin rates seem to be the rule. Moreover, in regard to butter, all of this is to the good for low prices are conducive to increased consumption and increased consumption means still more rapid turn-over.

When considering possible savings in cost that can be obtained at this point in the marketing stream it is reassuring to note that adjustments are in progress. In this segment of the trade the competitive struggle has been exceedingly sharp. Large-scale retailers have assumed some of the wholesalers' functions, while creameries have pushed closer to the retailers. These moves were pictured in the first flow chart. The net result has been to put considerable pressure on

the old-line wholesale agencies which, in turn, is even now reflected back to the newcomers. The process of reducing margins is still going on, but because the margin already is relatively small further reductions in costs may be expected to make their appearance slowly.

Heretofore, competition has been pretty much confined to wholesalers, but recent developments have brought the retail-wholesale groups together, thus centering the competition more sharply at the retail level. In consequence, practices in both retail and wholesale merchandising have been improved, selling costs have been reduced, and lower gross margins and increased turn-over have become the common practice.

RETAILING.—Not all wholesalers handle butter, but in normal times it is necessary to search far in any community to find a food retailer who does not have butter in stock. This means that butter is sold by very different kinds of retailers who may be expected to be operating their stores at different average margins. To give some idea of the extent of this variation, seven types of stores are listed in table 27 together with the average gross margin that was characteristic of each in 1939.

TABLE 27.—Operating data regarding retail food stores, expressed as percentage of sales, 1939

Item	Type of store													
	Dairy and poultry products		Grocery		Groceries and meats		Groceries with filling station		Country general		Meat		Chain ¹	
	Profitable	Unprofitable	Profitable	Unprofitable	Profitable	Unprofitable	Profitable	Unprofitable	Profitable	Unprofitable	Profitable	Unprofitable	Profitable	Unprofitable
Gross margin	Pct. 41.2	Pct. 30.7	Pct. 18.0	Pct. 18.5	Pct. 20.0	Pct. 15.7	Pct. 18.7	Pct. 12.4	Pct. 19.5	Pct. 13.4	Pct. 24.2	Pct. 20.0	Pct. 19.4	Pct. 17.6
Expense	Pct. 35.0	Pct. 38.0	Pct. 13.5	Pct. 18.8	Pct. 16.5	Pct. 13.4	Pct. 14.7	Pct. 17.4	Pct. 14.0	Pct. 17.6	Pct. 20.0	Pct. 21.4	Pct. 18.2	Pct. 16.2
Inventory turn-over	20.9	43.4	10.2	9.7	13.5	12.6	12.0	10.2	4.8	4.2	53.9	46.5	10.0	7.4

¹ McNair (27, p. 24)-Mitchell (30).

The store-wide rate of gross margin of the profitable concerns ranged from 18.7 percent of sales to 41.2 percent and that of the unprofitable firms from 12.4 percent to 36.7 percent. Such average margins, if applied to the retail price of butter of 31.1 cents, would be equivalent, respectively, to a butter margin of 5.8 cents, 12.8 cents, 4.2 cents, and 11.4 cents per pound. The estimate of the retailer's margin for butter appearing earlier was 5 cents per pound, which would be equivalent to 15 percent of sales. The butter margins of retail stores appear to be less than the prevailing average margin developed by all items in stock as was found earlier in the case of food wholesalers.

This supposition may be supported by some specific evidence. During one week in August 1942, investigators of the Bureau of Labor Statistics and Office of Price Administration found butter margins averaging about 5 cents a pound and 10 percent of the sales value

(table 28). The retail price, already reflecting the impact of war times, was about 50 cents. Prints in quarters brought a price premium of about 2 cents a pound and earned a little larger percentage margin than did rolls or bricks. Tub butter was not quoted. Undoubtedly marked quality differences are included within these figures so no merit attaches to the differences appearing between types of stores. It is important to note that the differences in average margins are not large. Here again, as was the case with wholesalers, the pressure of competition apparently keeps the prices of butter confined within a narrow range regardless of the type of store.

TABLE 28.—Gross margin of butter, by type of store and package, during one week in August 1942

Type of store and annual value of sales	Prints wrapped in 1/4's		Roll bricks	
	Margin per pound	Percentage of sales	Margin per pound	Percentage of sales
Independent:				
Under \$20,000	4.7	9.51	4.8	9.87
\$20,000-\$40,000	5.5	10.79	4.6	9.39
\$50,000-\$246,000	5.4	10.58	3.7	8.87
Chain: Under \$250,000	5.1	10.46	4.4	8.56
Supermarket: \$250,000	5.0	10.32	4.2	9.04

Office of Price Administration—Bureau of Labor Statistics Special Survey. [Unpublished.]

So far as the evidence goes, it leads toward the conclusion that butter is handled at a rate of gross margin that is much less than the average margin on all items sold by food retailers. Most of the types of stores for which data are given in table 27 developed a rate of gross margin on all sales of somewhere between 18 percent to 20 percent, which means that butter sells at a rate about one-half as large as the store-wide average.

Some comments on how this lower margin works out in the end were included in the discussion of the operations of wholesalers. In the Louisville retail study, additional points were brought out. The inventory investment in butter amounted to about 30 pounds valued at \$14.39, which was less than 1 percent of the total inventory value for the store as a whole. Canned goods, on the other hand, ran up an inventory value of 24 percent of the total. Because of low inventories, rapid turn-over, ease of handling, etc., the cost of handling, even with the necessary refrigeration, was low—7 percent of the total value of all butter sales compared with the average store-wide expense margin of 18.9 percent (55).

It can be seen that retail butter margins are relatively low. They are low because rapid turn-over in the end accumulates enough gross-margin dollars from butter to more than carry butter's share of the total earned margin. At the same time, because of its relatively low expense, butter accumulates less than its proportional share of the total store-wide expense. Butter, accordingly, appears to be paying its own way even though it has a relatively low rate of gross margin. It follows that a further reduction in the rate of margin on butter in retail stores depends much more on improvements and savings made in the handling of other commodities than in the case of butter itself.

In table 27 the closeness with which expense follows on the heels of gross margins is made apparent, but nowhere more so than in the case of the unprofitable concerns. For each dollar spent by the consumer at the retail food store, 81.6 cents during the year 1939 was used to satisfy the claims of the storekeeper's suppliers of merchandise, leaving 18.4 cents with which to pay his store expenses. In what proportions that 18.4 cents was distributed among the various items of expense is shown in table 29. Nearly two-thirds of it went for salaries and wages. The cost of occupancy amounted to an additional 14 percent. Help and housing, therefore, took three-fourths of the total. Credit losses added another 2 percent and advertising 3.3 percent. For those concerns which earned a profit, 8 percent was the figure reported.

These are the expenses out of which savings are to be gathered. Clearly, the better use of labor would tap the richest cost area. In a grocery store the convenient arrangements of stock, posting prices in plain view, and several other devices make it possible for consumers to use their own (free) labor while they are in the store. They thus relieve the storekeeper of that expense. Cash stores can reduce costs by an amount that equals up to 4 percent of sales by eliminating the work of opening and keeping charge accounts, and the item of credit losses can be avoided entirely. Both of these practices would shrink the margin but they do not necessarily save costs when the accounts of all parties—dealers and consumers—are totaled.

TABLE 29.—Distribution of gross margin of grocery stores according to type of expenditure, 1939

Item	Margin	Item	Margin
	Percent		Percent
Salaries and wages	60.9	Profits	8.1
Occupancy	14.1		
Advertising	3.3	Total	100.0
Credit losses	2.2	Gross margin rate as a percentage of sales	18.4
Other	11.4		

Mitchell (30).

MARKETING MARGINS AND COSTS FOR AMERICAN CHEESE

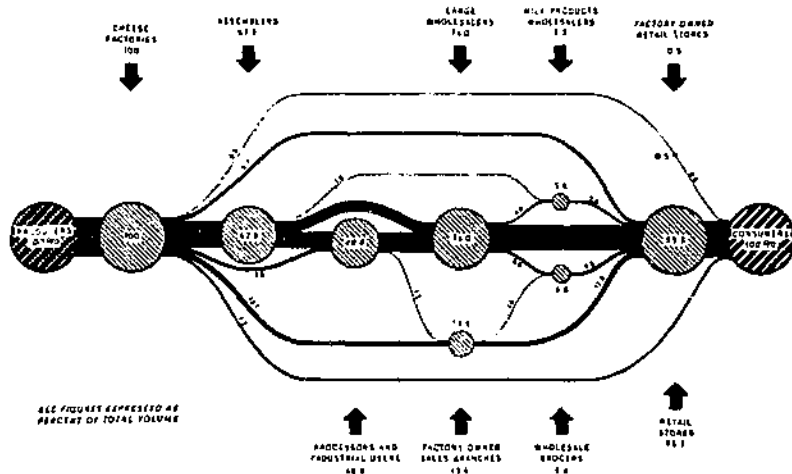
The division of the marketing and manufacturing margin of 12.4 cents for cheese in 1939 among the marketing agencies is the result of conditions fairly unique in American industry. On the one hand are the crossroads cheese factories—community enterprises of a kind rarely to be found nowadays in this country. On the other, is a group consisting of some 20 to 30 firms. This group has extended its activities so widely over the field lying between the cheese factory and the retailer that it has come to be responsible for the handling of the largest share of the cheese production in any single year. The picture is one of craftsmen working at their trade under conditions reminiscent of the household industries of long ago and of corporate organizations most modern in design and operation.

American cheese sold at retail, during 1939, for an average price of 24.1 cents per pound. At the same time, the farmer was paid the equivalent of 11.7 cents per pound of cheese for the milk used by the cheese factory. Thus, 12.4 cents per pound of cheese was left as the

estimated marketing and manufacturing margin. Stated in a different way, in 1939 the farmer received 49 cents out of every dollar's worth of cheese bought by the consumer, and 51 cents went to pay for the services and the supplies that were required in the course of manufacturing and marketing the cheese so bought. It is this 1939 margin of 12.4 cents per pound of cheese which subsequently will be divided among the various agencies that contributed to this marketing and manufacturing process.

MARKETING CHANNELS

There were 2,604 establishments in 1939 devoted primarily to the production of cheese. Of these, 2,284 produced American cheese which is the only kind under consideration here. More than two-thirds of the total sales of these American cheese factories were made to specialized merchants who are known in the cheese trade as assemblers (table 30). The next most important factory outlet was the factory-owned wholesale sales branches which accounted for 12.1



percent of the total factory sales. To manufacturers making processed cheese, cheese factories delivered 8.6 percent of their total production, and direct sales to consumers were equal to 4.2 percent. Details with respect to the other outlets tapped by cheese factories, as well as to routes followed by the cheese after it leaves the hands of these first purchasers, are shown in figure 17.

TABLE 30.—Factory sales of cheese by types of customers, 1939¹

Purchaser	Percentage of total sales	Purchaser	Percentage of total sales
Factory owned	Percent	Consumers at retail	Percent
Wholesale branches	12.1	Total	100.0
Retail stores	5	Sales made by brokers and commission houses	5.1
Wholesalers and jobbers	67.9		
Processors and industrial users	8.6		
Retailers	6.7		

¹ These figures do not include processed cheese.

Census of Business, Distribution of Manufacturers' Sales, 1939, vol. 547, table 1.

The most significant point brought out by this flow chart is that the concentration of volume, which first makes its appearance in the volume moved to assemblers, continues to be in evidence at later stages of the marketing process. True, there is a temporary division at the assembler's warehouse door, with about 40 percent of the total volume going to processors for further manufacturing; but after this manufacturing is done there is an even greater concentration in the firms identified in the chart as "large wholesalers." These few firms, which handle about 75 percent of all American cheese marketed, in turn assume the responsibility for supplying retailers with the major part of their cheese requirements. Thus cheese is one of the commodities which flow through a few well-defined channels. It is one of the industries in which ownership of the marketing agencies has been concentrated in a few hands, for the ownership of the assembling and the processing plants, to a considerable degree, rests with these same wholesale concerns. This explains why the main routes of traffic are laid out in the manner indicated in the flow chart.¹⁷

Table 31 sets out in considerable detail the types of buyers to whom 26 selected wholesale firms distributed cheese. These 26 concerns handled about three-fourths of the total cheese sold during the years to which the reports apply. The larger number of these concerns are the same ones listed in the flow chart as "large wholesalers." Several observations may be drawn from this table:

(1) The 26 firms sell only a small quantity of cheese to other middlemen. The producer-cooperatives sell a much larger relative volume in this way than the other manufacturers of this selected group. In the aggregate, however, it appears that wholesale grocers handle less than 10 percent of the total American cheese and the flow chart places the estimate at 7 percent.

(2) There is a considerable difference in the importance of sales made to chain and to independent retailers by the three groups of firms listed in the table. The meat packers serve independent stores primarily; in fact, the largest part of their sales of cheese is to such buyers. The producer-cooperative and the dairy companies, in contrast, place considerable emphasis upon chain stores as a sales outlet.

(3) Under the classification "route customers" are included sales made to homes, bakeries, institutions and restaurants; thus to a major degree this classification includes a volume that should be listed as sales to institutional users.

(4) Sales by these 26 firms are largely made by their own employees, for brokers and commission houses are reported as handling only 0.4 percent of their volume.

¹⁷ The causes for, and the consequence of, this concentration have been discussed at length by Nichols (54).

TABLE 31.—Sales of cheese, by selected wholesale concerns, and by types of purchasers, 1934 or 1935

Purchaser	6 producer cooperatives ¹	10 dairy companies ²	10 meat packing companies ³	Total
	Percent	Percent	Percent	Percent
Wholesalers				
Grocers	10.2	4.2	0.1	7.4
Others	2	10.3	.6	5.1
Brokers and commission houses	2	.0		.4
Retailers:				
Chain	22.4	20.4	6.0	14.4
Independents		1.9	71.8	35.4
Manufacturers and processors	1.7	14.7	5.5	0.5
Others:				
Route customers	47.2	44.2	3.7	24.6
Not specified	5.5	1.2	1.0	1.8
Government	3.6	2.2	.5	1.4
Total	100.0	100.0	100.0	100.0

¹ Includes the Dairyman's League Cooperative Association, Inc.; New England Dairies, Inc.; Twin City Milk Producers Association; Consolidated Dairy Products Co.; Land O' Lakes Creameries, Inc.; and Challenge Cream and Butter Association.

² Includes the following companies and their subsidiaries: National Dairy Products Corp.; The Borden Co.; Beatrice Creamery Co.; The Fairmont Creamery Co.; Carnation Co.; Pet Milk Co.; Golden State Co., Ltd.; Western Dairies, Inc.; Creameries of America, Inc.; American Dairies, Inc.

³ Includes the following companies and their domestic subsidiaries: Swift & Co.; Armour & Co.; Wilson & Co., Inc.; The Cudahy Co.; Hygrade Food Products Corp.; Kingan & Co.; George A. Hormel & Co.; The Rath Packing Co.; Jacob Doid Packing Co.; and John Morrell & Co.

Federal Trade Commission (57). Adapted from tables 309 and 318.

DIVISION OF THE CONSUMER'S DOLLAR

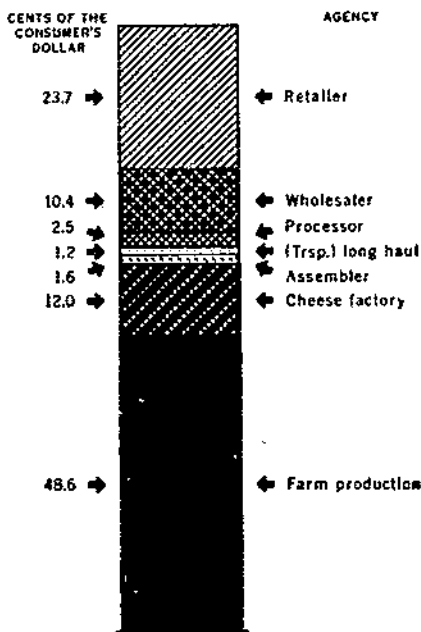
Out of the average price which consumers paid for American cheese in 1939 the farmer's share amounted to 11.7 cents per pound and 12.4 cents was left as the marketing margin. In the following paragraphs the share which represents the marketing margin is arranged in different ways to bring out how that margin was divided among various kinds of claimants.¹⁸

SHARES BY AGENCIES.—The margins taken by each type of agency engaged in the manufacturing or the marketing of American cheese are recorded in figure 18.

The farmer, in receiving approximately 49 percent out of each consumer's dollar spent for cheese, enjoyed the largest share of any agency; the retailer's share at 23.7 percent, comes next. The amount claimed by either the cheese factory or the wholesaler is about half as large as that of the retailer. Manufacturers of processed cheese received 2.5 percent of the cheese dollar, although the size of the claim is made unduly small because only a small part of the total processed cheese sold in 1939 has been included in the price series that were used to show average consumer prices. Had it all been included, the total manufacturing and marketing margin of the year would have been more than 12.4 cents, as would also the share of the manufacturers of the processed cheese.

The total transportation charge for long hauls, when pro-rated against all American cheese, is estimated at about 0.3 cent per pound

¹⁸ The average resale price in cents per pound of each marketing agency during 1939 is estimated as follows: farmer 11.7, cheese factory 14.3, assembler 14.9, processor 18.1, wholesaler 18.1, retailer 21.1 with a long-haul transportation charge of 0.3 paid at some point. The margins developed from these figures, weighted by the relative volumes given in figure 1, provide the base from which these several estimates have been made.



BAC 45620

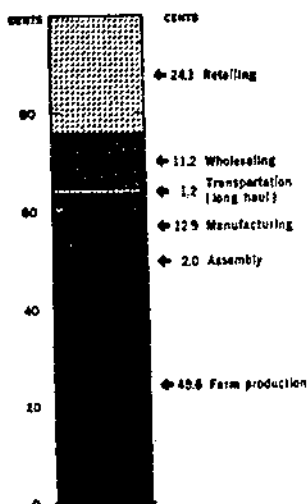
Figure 18. Approximate distribution of the consumer's dollar spent for American cheese, by agencies, United States, 1939.

or 1.2 percent of the consumer's cheese dollar. For all class I railroads the average charge made for all types of cheese hauled in 1939 amounted to about 0.8 cent per pound of cheese; apparently, therefore, the remaining 0.5 cent represented short-haul charges that are paid by wholesale and retail merchants. These payments would later appear as one of the expenses of doing business. The tonnage of cheese hauled for long distances by trucks is small and the truck receipts at four markets for all kinds of cheese amounted to only 4 percent of the total production of American cheese during the year. It is assumed that charges for truck hauling are not substantially different from charges made by railroads.

BREAK-DOWN BY FUNCTIONS.—A large number of individual tasks must be performed before cheese is ready for the consumer's table. For convenience, these tasks have been collected under one of the several descriptive headings appearing in figure 19.

The largest single share of the marketing expense, outside of the price paid to the farmer, was the expense of the retailing function. This service accounted for nearly half of the total marketing margin and about one-fourth of each consumer dollar spent for cheese.

By comparison, the shares claimed for wholesaling and for processing were about one-half as large. The cost of assembly is nominal. It looks smaller than it is, however, for no charge could be determined for the cost of bringing milk to the cheese factory. So this charge is included partly in the share shown for the farmer and partly in the share claimed by the cheese factory.

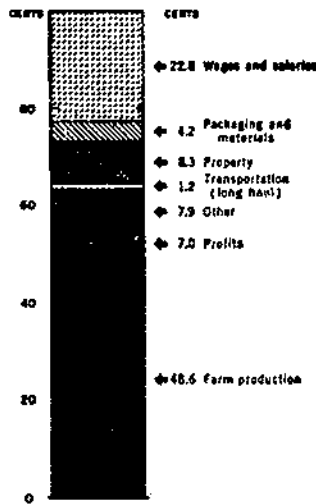


BAE 45088

FIGURE 19.—Approximate distribution of the consumer's dollar spent for American cheese, by functions, United States, 1939.

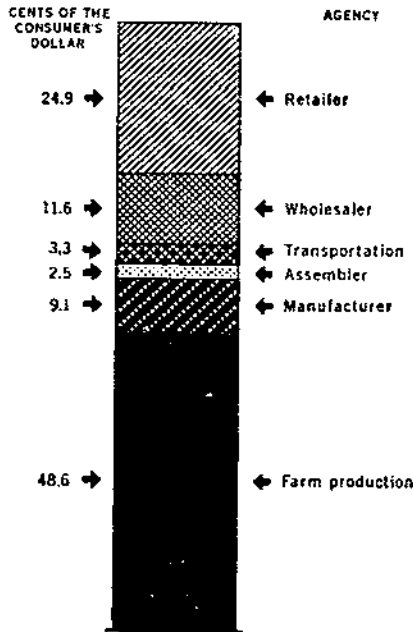
BREAK-DOWN BY EXPENSE ITEMS.—The distribution of the marketing margin for cheese of 12.4 cents per pound according to kinds of expense in 1939, is shown in figure 20. The cost of milk bought by the cheese factory was the largest single expenditure. Wages and salaries were the next largest and these are estimated at 22.8 percent of the amount of money consumers spent for cheese. At the same time, this bill for wages and salaries, which totaled 5.5 cents a pound of cheese, amounted to 44.4 percent of the marketing margin of 12.4 cents a pound. For property expense—which includes rent, light, heat, power, taxes, and similar charges—the estimate is 2.0 cents a pound or 8.3 percent of the total margin. The cost of supplies used in manufacturing and of packages was about half as much. Profits, concerning which more will be said later, equaled 7 percent of the total cheese dollar. The other expense items are given in figure 20.

BREAK-DOWN IN AN ILLUSTRATIVE CASE.—If a lot of cheese produced in northern Wisconsin were handled through regular channels and finally sold in New York, the distribution of the 1939 average retail price of 24.1 cents a pound would be something like that shown in figure 21. These results differ somewhat from those shown in figure 18. The major difference expressed in cents per pound, is in the charge for transportation which here amounts to 0.8 cent per pound compared with the average applicable to all cheese of 0.3 cent. In consequence, the share of the consumer's cheese dollar paid out for transportation increased to 3.3 percent. The share of the factory decreases by nearly 3 percent because this cheese was sold through regular channels, whereas cheese factories generally marketed nearly 12 percent of the total production at retail, or directly to retail stores, at prices somewhat higher than they could obtain from assemblers.



BAE 4568B

FIGURE 20.—Approximate distribution of the consumer's dollar spent for American cheese, by type of expense, United States, 1939.



BAE 45621

FIGURE 21.—Approximate distribution of the consumer's dollar spent for American cheese, manufactured in Wisconsin and sold in New York City, by agencies, 1939.

ANALYSIS OF MARGINS

CHEESE MAKING.—Cheese making is of ancient origin. Cheese, with some justification, might be said to be a natural product, for when milk sours a curd is formed which in itself is a kind of cheese. Nowadays, success in cheese making involves more than just being able to make cheese. It depends upon how well the cheese is made, and this in turn depends upon a great many things, not the least of which is the practice of the skill. Successful cheese making depends to a considerable degree on such commonplace things as yields of cheese per hundredweight of milk; the quality of the final product, the money paid out for supplies and equipment used in manufacturing, and the amount of money received for the cheese.

The Census of Manufactures for 1939 reports 2.5 cents per pound as the cost of manufacturing cheese. This total cost is made up of a charge of 1.08 cents for wages and salaries, 1.42 cents for all purchased supplies and containers, and 0.04 cent for power and fuel. But these figures provide only a starting point in the present calculations, for they apply to all types of cheese made in factories; and it is well known that some kinds of cheese are more expensive to manufacture than American cheese. Moreover, the Census figure is inadequate because it does not include either an allowance for fixed charges or such profits as may be earned.

In approaching the matter of manufacturing cost, consideration must be given to the fact that cheese is produced under three rather different situations of cost.

Most important, in terms of number of concerns, is the community cheese factory of the type common in Wisconsin. This is a simple plant, in appearance much resembling a dwelling (and it sometimes serves that purpose, too) costing from \$2,000 to \$5,000 and containing manufacturing equipment of about an equal value. In 1927, it was estimated that 72 percent of such Wisconsin factories had a value of less than \$4,000 each and 84 percent contained equipment of a value less than \$2,500 (1). For the most part, these are small factories having a capacity of less than 10,000 pounds of milk daily during the season of flush production. For new factories of the same size constructed in 1928, the investment in building was estimated to be \$5,000 and the cost of equipment \$6,000 (52).

The first point to be considered in determining manufacturing costs of community cheese factories, therefore, is that firms of this kind require a small capital investment. The building and equipment charge (if any such charge is made) may range from 0.2 to 0.5 cent per pound of cheese. The second is that these plants draw most of their milk from adjoining farmers who are located mostly within a radius of 2 to 3 miles from the factory and the farmer himself brings his milk to the factory each day. It takes about 10 pounds of milk to make a pound of cheese. Therefore, if the factory where this reduction in weight occurs is close to the sources of milk supply, much transportation is saved. Even more important is the fact that this arrangement is likely to insure the receipt of the very high quality of milk required to make good cheese, because the hauling time is kept to a minimum. A community cheese factory draws from a limited number of adjacent farms, and only a few miles down the road

there is usually another factory that takes the milk from its neighboring farms.

In these community cheese factories a most unusual arrangement has developed between the factory operator and his patrons. The buildings frequently are owned by the local farmers, the cheese maker providing the equipment and the necessary supplies. Under these circumstances, the cheese maker either works for a salary or is paid a fee for each pound of cheese produced. But even if the cheese maker owns the factory and the equipment, there is likely to be some cooperative arrangement with the patrons which means that the enterprise is much more like a farmer-cheese maker joint venture than a strictly commercial operation.

Whatever arrangements are finally worked out between the cheese maker and his patrons it is not common for milk to be bought outright. The net result is that the farmer's bulky and perishable product has been converted close to home into one that has the opposite characteristics, and the cheese maker has had the opportunity to convert his time and skill into an annual earning.

The commercial cheese factory is larger and more elaborately equipped than the community factory. It must pay attention to the volume handled; hence the territory from which it must gather milk has to be considerably larger. This means longer in-bound hauls. Expenditure for buildings and equipment must be larger. In all probability the installation of expensive pasteurizing, refrigerating, and can-washing facilities will become imperative and these new pieces of equipment will more than double the total expenditures for equipment over those required in the community factory having similar capacity. Thus, this type of factory is brought face to face with the inexorable relationship between volume and costs which seems to be of much less importance to the community factory.

There is still one more kind of cost structure. No serious problem is involved in setting up a cheese vat in plants that are principally devoted to making butter and condensed milk or in handling market milk, and operating the vat from time to time. From the Census of Manufactures of 1939 it appears that about 10 percent of the total cheese produced in this country was made in plants not primarily

TABLE 32.—*Production of American cheese, number of factories, and average production per factory for specified States, 1939*

State	Production		Factories		Average product per factory
	Quantity	Percentage of total	Actual	Percentage of total	
	1,000,000 pounds	Percent	Number	Percent	1,000 pounds
Wisconsin.....	284.0	62.0	1,451	63.5	196.7
Illinois.....	29.2	5.4	58	3.0	351.8
Indiana.....	24.2	4.5	45	2.0	337.3
Oregon.....	19.9	3.7	50	2.2	369.0
Texas.....	15.1	2.8	33	1.4	457.6
Others.....	164.9	30.7	617	27.0	257.3
Total.....	537.3	100.0	2,284	100.0	235.2

devoted to cheese production. There are costs associated with occasional operation of these cheese vats, some of which can be itemized with ease and some only with difficulty. The answer as to costs will depend upon the accounting practices followed by particular concerns.

A rough impression of the importance of these several types of concerns may be gathered from table 32. More than half the American cheese produced during 1939 was made in Wisconsin where the average production per factory was a little less than 200,000 pounds per year. In Illinois, the next largest producing State, which accounts for only 5 percent of the United States total, the average production per factory was about 300,000 pounds. In neighboring Indiana the average factory production per factory was over 500,000 pounds.

In 1939, in Wisconsin, four cooperative cheese factories of different volume, reported costs per pound of cheese made ranging from 2.2 cents for the smallest producer to 1.5 cents for the largest (table 33). This difference of 0.7 cent a pound is equal to about 5 percent on the factories' selling price for cheese. In general, costs of operation seem to decrease as the volume of cheese made grows larger. At the same time, the difference in manufacturing cost between the plant that produces 500,000 pounds and the plant that produces nearly 2½ times as much was only 0.2 cent per pound.

TABLE 33.—*Factory costs per pound of cheese made, Wisconsin, 1939*

Item	Cost per pound of cheese made in factory producing—			
	1,230,000 pounds	776,000 pounds	479,000 pounds	354,000 pounds
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Plant expense:				
Wages and salaries.....	0.44	0.38	0.54	0.82
Materials and containers.....	.76	.70	.73	.65
Power, fuel, light.....	.07	.16	.14	.23
Other.....		.02		
Total.....	1.27	1.32	1.41	1.70
General expense:				
Interest, depreciation, repairs, taxes.....	.15	.29	.28	.48
Administrative.....		.08	.03	.02
Other.....	.11	.05	.05	.02
Total.....	.26	.40	.36	.52
Grand total.....	1.53	1.72	1.77	2.22

Cooperative Auditing Service, Minneapolis, Minn.

It would appear that the influence of volume upon cost in cheese factories is not so great as that experienced in other types of manufacturing. If the expenditure for wages and salaries in the smallest plant had been as much as 0.5 cent a pound lower, which is a variation that could easily occur between plants, the greater part of the differences between these factories would disappear. In commercial factories of this kind it requires about three men for each 10,000-pound cheese vat, and a plant containing more than one vat would require more men in about this same ratio. Thus, if plants of quite different size enjoyed the same seasonal variation in milk receipts, if all vats were equally filled each run, and if the wage rates were similar, the

labor costs per pound of cheese in the several factories could be expected to be nearly the same.

The sum of the plant expenses equals about three-fourths of the total factory cost for all but the largest firm; for this firm the relative figure is 84 percent. That is because the sum of the "general expense" items declines with increasing volume, amounting to 23 percent of the total for the 300,000-pound plant and to 16 percent for the million-pound plant. The cost of materials and containers in all plants is much the same. It amounts to about three-fourths of a cent per pound of cheese produced. With total factory costs that differ, this similar container charge is equal to about half of the total cost of the large plant and less than one-third of the total cost of the smaller one. All told, it would appear that somewhere in the neighborhood of 1.5 to 2.0 cents per pound was about as low as manufacturing costs could fall under the conditions that existed during 1939. The estimated cheese-factory costs included in the distribution of the consumer cheese dollar was 2.9 cents per pound which includes an allowance for profits not provided for by these four cooperative concerns and an unknown amount of in-bound transportation charges paid for hauling milk. The four Wisconsin factories had an average in-bound hauling cost of 0.3 cent per pound of cheese made.

The tenacity with which plant expenses in a given factory hold within a narrow range in spite of very wide differences in the volume of cheese produced is illustrated by the following monthly figures of one large cheese factory. In the month when production was at the annual rate of 700,000 pounds, plant (not total) expenses amounted to 1.85 cents for each pound of cheese produced. But when the annual rate of production increased to 1,000,000 pounds, these expenses totaled 1.78 cents; and when the rate grew to 2,500,000 pounds, the expenses were 1.72 cents.¹⁹ The plant expense of this firm was somewhat larger than that of any of the four cooperative factories for which data are given in table 33.

Differences between cheese factory costs, however, are traceable to differences in the plant and its equipment. A cheese factory that produces 300,000 pounds of cheese annually with respect to which a capital outlay of \$12,000 has been made in plant and equipment would have fixed charges per pound of cheese that would be about 0.4 cent less than a plant that handles exactly the same volume and had \$18,000 invested in building and equipment. The \$6,000 difference in outlay, in this case, was traceable to the fact that one plant was equipped with pasteurizing and cooling equipment and can washers, and the other was not. The plant with the larger investment will be obliged to push its volume beyond the 300,000-pound point if it is to stand on an equal cost basis with the other.

Preliminary estimates indicate that from 40 to 50 percent of the American cheese produced in recent years has been made from pasteurized milk.²⁰ In parts of the country where the large cheese factory predominates, pasteurization may be expected to be the common practice. On the other hand, in the older cheese-producing

¹⁹ Adapted from materials furnished by OPA.

²⁰ Dairy Branch, Production and Marketing Administration, United States Department of Agriculture.

areas, like Wisconsin and New York, 25 percent or less of the total production is made from pasteurized milk. These are the areas where the small factory is most common. They are likewise the areas from which came nearly 60 percent of the total American cheese produced in 1939.

The small community cheese factory seems to stand on a considerably different footing than the large firm. Often it is a one-man establishment. Its factory building is simple and inexpensive. It is not likely to be equipped with can washers, pasteurizers, or cooling facilities. Thus the charge made for building and equipment may well fall on a plane which compares not unfavorably with the ordinary commercial factory, particularly if that factory is producing within the volume range of 300,000 to 500,000 pounds. The cost of supplies and containers to all types of factories should not be substantially different. The practice of the small factory of selling its cheese soon after it is made reduces floor-space requirements and also minimizes the labor needed and the losses in weight that accompany longer holding. In 1937, of the 48 community factories paying cheese makers on the basis of a pound of cheese, 47 paid 1 cent a pound or less. Out of 106 factories where the fee to the cheese maker contemplated that he would also furnish the supplies, 71 paid 2½ cents a pound or less. There is no apparent reason why a well-run community cheese factory should not be able to turn out a product at a cost comparable with that of a larger cheese factory.

Estimates of the cost of operating cheese factories of various size that were to be erected in central Washington in 1941 are given in table 34. These plants were to be equipped with can washers, mechanical cooling facilities, and pasteurizers. Moreover, they were to have sufficient storage space to cure a much larger part of their production than is customary in Wisconsin. The total investment required for each such plant is shown in this table, as is the break-down of the operating costs. However, the costs shown for the six plants are as low as they are only because it was assumed that daily receipts of milk would average no less than 80 percent of the receipts during the flush season. In the important cheese-producing areas, average daily receipts of 60 percent are considered satisfactory. If these six factories were located in Wisconsin they probably would show operating costs somewhat higher than those now recorded.

In making comparisons of costs between factories of varying size on the basis of the data in tables 33 and 34, allowance has to be made for the fact that the data for the Washington factories, in table 34, are estimates by engineers and not actual operating costs. Also, the Washington estimates are for 1941, when costs were generally higher than in 1939 for which the Wisconsin costs were compiled. In addition, the estimated costs in these plants make some allowance for ageing and may result in some increase in prices over those received by plants without such facilities. However, there are two points that appear to be indicated by these tables which are worth noting:

(1) With each plant operating nearly at optimum capacity, the estimated costs in these western plants are higher than those in the Wisconsin factories of comparable size. Moreover, only the 3-million-pound factory in Washington shows estimates of lower operating costs than either of the two middle-sized plants in Wisconsin.

Thus the first point noted is that a plant with heavy investment in equipment may carry a cost load that can prove to be a considerable handicap. It can fail to be as economical as the much less imposing small factory.

(2) Total operating costs of cheese factories per pound of product decline slowly as the volume handled is increased. (This is not the same as saying unit operating costs decline as the plant of a given size approaches its optimum.) The largest plant shown in the table develops a unit cost that is about 1 cent per pound of cheese less than that of the smallest factory, but to reduce operating costs by 1 cent requires a tenfold increase in production. The advantages of scale are not large and they make their appearance reluctantly.

TABLE 34.—Estimated costs of production of cheese in factories of various size, central Washington, 1941

Cheese made (pounds)	Total cost of building and equipment	Costs per pound of cheese produced						
		Building ¹	Equip-ment ¹	Total fixed costs	Fuel, power light, and refrigeration	Labor and manage-ment	Supplies	Total
	Dollars	Cents	Cents	Cents	Cents	Cents	Cents	Cents
321,200	18,046	0.21	0.71	0.92	0.34	0.71	0.71	2.68
642,400	23,070	.14	.44	.58	.27	.60	.68	2.13
963,600	28,500	.12	.36	.48	.21	.50	.60	1.95
1,284,800	34,000	.10	.31	.41	.19	.57	.68	1.86
1,606,000	39,100	.09	.32	.41	.19	.56	.65	1.81
3,212,000	52,450	.07	.21	.28	.16	.56	.65	1.68

¹ Includes charges for depreciation, interest, repairs, maintenance, insurance, and taxes. Sufficient curing space is provided to store the maximum output for about 3 weeks.

Agricultural Processing Industries in the Columbia Basin Irrigation Project. Calhoun, W. T., Bressler, R. G., Bedford, C. L., and White, H. H. Report by BAE on Problem 24 Columbia Basin Joint Investigation, table 35. September 1942.

Two other considerations, however, influence the costs of cheese factories regardless of the volume produced. It is less costly to make cheese of the larger size because less labor is involved in preparing the cheese forms and in the later handling of the cheese. The Office of Price Administration recognized this when it set the 1945 ceilings on prices for cheese of the larger styles, like Cheddar and Twins, at 1 cent a pound less than the ceilings for Daisies and 1.25 cents less than that for the smaller consumer styles.²¹

The relative importance of the large and the small styles in 1939 is apparent from the data given in table 35. Nearly two-thirds of the total receipts at Wisconsin warehouses during that year consisted of the larger cheeses. Moreover, it would appear from reports received by the Bureau of Agricultural Economics during 1942 that essentially the same would have been bound to be true from figures representing the receipts at warehouses located outside of Wisconsin. In considering means of reducing marketing and processing costs the dramatic shift in the proportions of the large and small cheeses which had been taking place during the 10 years preceding 1939, will be important. In 1928, it was the small cheese which made up nearly two-thirds of the total American cheese produced. If costs of manu-

²¹ Revised Maximum Price Regulations No. 289.

facturing the larger styles are less by as much as the price differential allowed by the Office of Price Administration, there has been a substantial reduction in cheese-factory costs.

TABLE 35.—Warehouse receipts, by styles of cheese, Wisconsin, 1928 and 1939

Styles	Approximate weight	Percentage of total receipts—	
		1928	1939
	Pounds	Percent	Percent
Large styles:			
Flats.....	35	2.5	2.7
Twins.....	70	14.9	10.0
Cheddars.....	70	18.3	46.9
80-lb. blocks and mammoths.....	80	2.5	2.8
Total.....		38.2	63.0
Small styles:			
Daisies.....	22	30.0	22.5
Young Americas.....	12	1.4	.0
Long Horns.....	12	10.2	9.0
Squares.....	10	4.4	3.2
8-lb. loaf and others.....	5	.8	1.7
Total.....		61.8	37.0
Grand total.....		100.0	100.0

Agricultural Marketing Service, U. S. Department of Agriculture.

There is little doubt, however, that the practice of increasing the quantity of large cheeses manufactured has had a definite bearing on the growing importance of processed cheese. Manufacturers of processed cheese find it more economical to use the larger styles because the losses in trimming which occur in the course of preparing the cheese for the processor's vat are related to the relative surface area of the style of cheese used. The Cheddar styles are reported to have developed trimming losses of about 12 percent by weight, whereas those for Daisy and Young America amounted to 20 percent(60).

ASSEMBLY.—The curd mass, as it is taken from the cheese press, has no real cheese flavor and is inclined to be tough and rubber-like. But when ripened it becomes mellow in body and capable of imparting a taste that is pleasant, smooth, and rich.

Whether such desirable characteristics appear during the ripening depends first upon the milk from which the cheese was made. That is why it is so important that the milk received at the factory be fresh, sweet, and free from objectionable odors and flavors, and have a low bacteria count. A short haul provides little opportunity for milk to deteriorate while in transit and makes unnecessary the cooling of the morning milk. Moreover, when the farmer brings milk to the factory each day, a personal relationship is established which makes it easy for the cheesemaker to get the producer to undertake promptly whatever measures are needed to insure quality milk at all times. One lot of poor milk can injure an entire batch of cheese.

These desirable characteristics also depend upon proper care and handling of the cheese during the ripening process. This is one of the tasks assumed by the assembler. Another kind of change that takes place during storage is a chemical alteration of the cheese mass. The

chemical changes are influenced by factors under the control of the cheese maker such as the moisture and salt content of the cheese, the style of cheese, and the use of varying quantities of rennet extract. The temperature of the storage room, which is under the control of the assembler, also influences these chemical changes (60).

In the case of many products, storage is primarily designed to bring into balance the supplies available at any time and the current requirements. This service is especially important when production is seasonal and consumption is not. That the storage of cheese is designed to serve a purpose of this kind can be seen by comparing the figures for monthly production with the figures for cold-storage holdings during 1939, both of which are given in table 36. But storage of cheese also is designed—necessarily—to bring out the familiar and desirable characteristics of American cheese. Thus storage may be viewed as one of the essential steps involved in manufacturing cheese. The average time in store probably has decreased in recent years because the processed cheese manufacturer can sell "green" cheese as part of the blend.

TABLE 36.—*Production and cold-storage holdings of American cheese, 1939*

Month	Production	Cold storage holdings first of the month	Month	Production	Cold storage holdings first of the month
	Million pounds	Million pounds		Million pounds	Million pounds
January	29.7	102.6	July	41.0	81.3
February	28.9	100.4	August	34.9	97.4
March	36.3	77.3	September	40.1	103.6
April	43.6	68.8	October	40.7	97.6
May	62.2	62.9	November	31.7	94.0
June	70.7	64.8	December	30.8	90.2

(United States Department of Agriculture (5)).

Ripening may be done at the cheese factory, but in the more important cheese-producing areas, notably in Wisconsin, a group of specialized merchants have taken this process over. These warehousemen not only cure the cheese gathered from factories a few days after it is made, but also are responsible for the inbound transportation; and they seek out buyers for their stocks. Thus, warehousemen serve in many capacities—as assemblers, warehousemen, processors, and distributors. No doubt these assemblers have made possible the continuing existence of the small community cheese factory by permitting it to specialize in making cheese. Out of 165 cheese factories visited in Wisconsin in 1928, 77 were found to have curing rooms of a size sufficient to handle only the production of 7 days or less, during the season of maximum output (1, p. 20).

No doubt, too, it is the prevalence of these many small community cheese factories that has caused the assembling facilities to be located at nearby country points rather than in distant cities. In any event, it is at this assembling point in the cheese-marketing process that the integration so characteristic of the cheese industry first makes its appearance. In Wisconsin, in 1935, warehouses that were owned or controlled by the national concerns were reported to have handled

more than 75 percent of all the cheese received by assemblers in that State (12).

Table 37 shows the estimated expense of warehousemen who perform this assembling function. Somewhere in the neighborhood of five-eighths of a cent a pound of cheese is said to be the common charge, a figure that appears to be borne out by the table. However, the table includes two items that can be altered substantially and thus can result in a considerable range in the costs of individual assemblers. The first is the cost of in-bound transportation. This charge may be either larger or smaller than the 0.12 cent shown in the table. Further investigation is needed to establish the appropriate figure. The second is the charge made for storage. In practice the amount of this charge will depend upon how long the warehouseman holds the cheese. At commercial rates, the cost of storage, which would be equivalent only to the warehousing service performed by assemblers, would add up, on the basis of 1 pound of cheese, to from 0.3 to 0.42 cent for a 2-month storage period, from 0.43 to 0.58 cent for 4-month holding, and from 0.8 to 1.1 cents for a 6-month storage.²² Such a charge includes only the cost of storage, making no allowance for shrinkages that occur when cheese is held nor for risks and insurance and interest on investment.

These costs, when compared with the assembler's charge of 0.63 cent suggest that only a small part of the assembler's yearly volume is stored for a long period. Accordingly, it appears that the assembling charge of five-eighths of a cent, tentatively set down here, will prove to be somewhat generous. However, in the absence of information concerning the length of the storage period of the cheese included in the present price series, there is no basis on which to make a correction.

TABLE 37.—Estimated operating costs of cheese assemblers, 1942

Item	Cost per pound	Percentage of total	Item	Cost per pound	Percentage of total
	Cents	Percent		Cents	Percent
Wages	0.18	28.1	Salaries (administration and selling)	.15	23.8
Transportation (cheese in-bound)	.12	19.0	Other	.03	4.8
Supplies	.05	7.9	Total	.63	100.0
Fuel, power, light, refrigeration	.03	4.5			
Depreciation, rent, taxes, repairs, etc.	.09	14.3			

Data assembled by Office of Price Administration and made available for use only as industry summaries.

Wages and salaries are estimated to amount to a little less than half of the assembler's total expenses of operation, but salaries here include the cost of the sales force and are not strictly chargeable to warehousing alone. The charges for rent, depreciation, power, refrigeration, etc., add up to about 20 percent of the total. The cost of supplies, consisting mainly of the expenditures for paraffin and office supplies, amounts to about 8 percent of the total assembler's margin.

²² The Office of Price Administration has allowed a mark-up of 2.25 cents per pound for cheese held 6 months or more and this presumably sets the outside limits of the sum of the costs experienced in long storage. However, no "sharp" cheese is included in the marketing and manufacturing margins discussed herein.

About 68 percent of the total cheese marketed in 1939 was handled by assemblers. Storage may have occurred in public cold-storage warehouses or in the assemblers' own facilities, but to be counted under this heading the cheese must have left the factory where it was produced. In Wisconsin, where assemblers can be most clearly identified because they are specialists in this kind of business, there were 93 cheese warehouses in 1935. They handled approximately half the American cheese produced within the State. The average volume of cheese handled by warehouses of different size is shown in table 38. More than half the total number of warehouses handled less than 2 million pounds and about 80 percent of them less than 4 million. The division of the total pounds of cheese handled by assemblers among the several size groups appears in the fourth column of the table.

Except in the case of the very small warehouses whose combined tonnage amounted to 3 percent, and the very large ones handling 29 percent, there was not much difference in the relative importance of the business done by each size group. That is, the data fail to indicate that a particular size of warehouse has a decided advantage in efficiency. Had there been any particular size of warehouse operation of proved superiority, it should have shown up in the figures regarding the volume handled by warehouses owned by the companies having Nation-wide business. The average volume per warehouse by size groups, of the so-called national companies, is not significantly different from that handled by warehouses of other ownerships.

It would appear that once again the economies of scale are not outstanding just as they were not in the case of the cheese factory. If a facility, whatever its capacity, is adequately filled, one size of warehouse will be about as efficient as another.

TABLE 38.—American cheese warehouses by size groups and ownerships, Wisconsin, 1935

Size of warehouse in terms of cheese receipts (1,000,000 pounds)	All ownerships			National companies		Other	
	Warehouses	Average receipts	Percentage of total	Warehouses	Average receipts	Warehouses	Average receipts
	Number	1,000 pounds	Percent	Number	1,000 pounds	Number	1,000 pounds
Under 1.....	16	483	3	8	504	8	465
1 to 1.9.....	33	1,465	21	22	1,459	11	1,478
2 to 2.9.....	15	2,408	15	10	2,458	5	2,307
3 to 3.9.....	13	3,628	19	11	3,495	2	3,712
4 to 4.9.....	7	4,202	13	5	4,252	2	4,077
5 and over.....	9	7,760	29	7	8,016	2	6,866
Total or average.....	93	2,559	100	63	2,813	30	2,028

Fraker and Colebank (12, p. 49).

PROCESSED CHEESE.—In recent years the product of the cheese factory has been the subject of further processing. The resulting product is known either as "pasteurized" or as "processed" cheese.

It is the nonprocessed, "natural or store cheese" of the American type which is of most concern at this time. An effort was made to confine present considerations to natural cheese, but as one of the retail-price series used in developing figures to represent the cost of

cheese to consumers included quotations for processed cheese, some part of the total production of this type of cheese is represented. It is assumed, for present purposes, that 24 percent of the total market-basket purchases of cheese in 1939 consisted of processed cheese.

Estimates of the manufacturing expense involved in making processed cheese are given in table 39. The total operating expenses are set down at 3½ cents per pound. Of this amount, expenditures for supplies, consisting mostly of the familiar consumer package and the shipping containers in which it is packed, amounted to 1.6 cents per pound or nearly half of the processor's total cost. There is left from the 3.5 cents total a little less than 2 cents a pound as the cost of manufacturing processed cheese.

It is reported that a plant having an annual capacity of 1 million pounds of processed cheese could be operated by six factory employees with the sum of their wages amounting to ½ to 1 cent per pound of cheese made. The equipment of such a factory would have a value of about \$2,500. The figures given in table 39 place wage costs at approximately 0.6 cent and the combined equipment, occupancy, fuel, and similar charges at about 1.0 cent per pound.

TABLE 39.—*Estimated manufacturing costs of processed cheese, 1942*

Item	Cost per pound	Percentage of total
	Cents	Percent
Wages	0.6	17.1
Supplies	1.6	45.8
Fuel, light, water, power	.1	2.9
Salaries	.2	5.7
Rent, depreciation, repairs, taxes, interest	.4	11.4
Other	.8	17.1
Total	3.5	100.0

Data assembled by Office of Price Administration and available for use only as industry summaries.

WHOLESALEERS.—All but 11 percent of the cheese marketed in 1939 passed through the hands of some kind of wholesale agency. By far the largest part of this volume was handled by the integrated dairy-and-meat packing concerns. The major part of the cheese sales of these firms was made direct to retailers and to institutions. These firms also supplied the major part of the demands of independent wholesale merchants but this volume of business was small—only one-tenth of the total cheese marketed during the year.

It is estimated that the wholesaler's share of the 24.1 cents which was the average retail price for cheese, was 2.5 cents in 1939. In 1945, the Office of Price Administration defined maximum prices in such a way that the combined margin of primary wholesalers and of service wholesalers ranged from 2.64 to 2.77 cents per pound, depending upon the style of the cheese involved (table 40). The margin of 2.5 cents is equal to 10.4 cents out of the consumer's cheese dollar and 20 percent of the total marketing and processing margin. If the average selling price of all wholesale merchants in 1939 was 18.1 cents per pound, the gross margin of such concerns would be in the neighborhood of 14 to 16 percent of the resale value.

TABLE 40.—Office of Price Administration maximum price per pound delivered at Wisconsin points, by style of American cheese and type of agency, 1945

Style	Factory FOB	Assemblers	Primary wholesalers	Service wholesalers	Cash and carry wholesalers
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Natural cheese, Cheddar, and larger	23.25	24.00	24.48	26.64	25.68
Flats	23.50	24.25	24.73	26.91	25.94
Double and triple daisies	23.75	24.50	24.99	27.19	26.21
Single daisies, longhorns, and young Americas	24.25	25.00	25.50	27.75	26.75
Pieces, midgets, square prints, natural loaf, and smaller	24.50	25.25	25.75	28.02	27.01
Processed cheese:					
1/4 pound or less	29.75		30.34	33.76	31.83
1/4 pound to 2 pounds	28.00		28.59	31.08	29.06
Over 2 pounds	27.00		27.54	29.97	28.89

Office of Price Administration maximum price regulations.

The average operating expenses of various types of wholesalers reported by the 1939 Census of Business appears in table 41. These data are for firms that handle some cheese along with other merchandise. It is not disclosed in which group are to be found those firms that play a dominant part in the wholesale cheese trade. The total expenses of the three types of wholesalers shown in this table and the disposition of those total expenses among various types of expenditures are sufficiently close to warrant the general observation that the operating expense of wholesalers was in the neighborhood of 10 percent of sales. In this event, the break-down in terms of percentage of sales would be as follows: Administration 2.5 percent, selling 2.2 percent, delivery 1.7 percent, warehouse 1.3 percent, occupancy and other expenses 2.3 percent. The cost of pay rolls, which is charged to each of these expense classifications, is about 4 percent of sales and 40 percent of the wholesaler's total expenses.

If 10 percent is representative of the business expenses of wholesalers who handle cheese, and the gross margin taken on cheese sales in 1939 was 14 to 16 percent, then the profits earned by wholesalers on the cheese they sold would be from 4 to 6 percent of the wholesale value of the cheese and from 25 to 36 percent of the wholesaler's gross margin. When more than one wholesaler is involved in the handling of cheese and this appears to be the case with respect to about 12 percent of the total American cheese marketed—this margin would be divided among the several concerns in some way not now apparent.

 TABLE 41.—Operating expense by wholesale trade and by type of expense 1939¹

Trade	Total	Administrative	Selling	Delivery	Warehouse	Occupancy	Other
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Dairy and poultry products	8.0	2.3	1.7	1.5	1.1	1.4	0.6
Meat and provisions	11.4	2.7	2.0	1.8	1.3	1.9	1.1
Groceries, general line	9.9	2.5	2.4	1.7	1.3	1.3	.7

¹ Includes firms with total sales of \$100,000 or more.

Census of Business, Wholesale Trade, 1939, vol. II (48, table 5).

Some confirmation of these deductions drawn from census data is found in the figures developed as a result of the Federal Trade Commission's segregation of the operating expenses applicable to the 1940 cheese sales of four dairy-products firms. The results are shown in table 42. The gross margin taken on cheese by these concerns was over 24 percent of sales. But as total expenses came to a little more than 17 percent there was left on balance 6.8 percent of sales as profit. This showing of profits earned from handling cheese falls within the range derived from the census data. But expenses of the concerns that were chargeable directly to cheese were considerably larger than the census figures. As more than 3 percent of the total expense is devoted to advertising, it would appear that the proportion of processed cheese handled by them was much larger than that included here when calculating the 1939 marketing and processing margin. Then too, the sales of these concerns include foreign types which were wholly excluded from the present calculations. The Federal Trade Commission pointed out that these firms customarily store and wholesale their cheese in a way that involves refrigeration shipment, and storage in branch houses (57, p. 59). Often they deliver to retail and institutional buyers by company-owned trucks. This is essentially the same kind of distribution service that is provided by meat packers who operate branch houses.

Comparison of the gross margins, profits, and distribution expenses involved in the marketing of cheese with similar figures for butter is made in this table. Of significance is the fact that the figures setting out the gross margin, the expense, and the profit applicable to sales of cheese exceeded those for butter. The gross margin taken by cheese wholesalers is over 24 percent of sales, while the margin on butter amounts to about 16 percent. Although the expenses of handling cheese exceed those for butter by about 3½ percent, still they do not bear the same relation to the gross margin in each instance and there remains as profit a return of 6.84 percent of sales which is nearly twice that earned by butter.

TABLE 42.—Distribution of selected wholesaler's gross margin for all types of cheese, by types of expense, 1940

Type of expense	4 cheese concerns ¹		12 butter concerns ²	
	Percentage of sales	Percentage of gross margin	Percentage of sales	Percentage of gross margin
Administrative and general	2.82	11.7	5.08	31.2
Selling	11.02	45.7	7.99	47.2
Advertising	3.36	13.9	.59	3.6
Provision for bad debts	.07	.3	.24	1.5
Net profit (before interest and income taxes)	6.54	25.4	2.69	16.5
Total gross margin	24.11	100.0	16.29	100.0

¹ \$121,500,000 net sales.

² \$148,500,000 net sales.

Federal Trade Commission (57, p. 89)

RETAILERS.—Cheese appears to be a profitable item to retailers. The reason is not hard to find. In the pricing scheme of retailers, cheese is assigned a gross margin that is as high or higher than the

average of all items handled in the store. But other articles in the store carry a higher margin and still make only small contributions to profits, so the key to the matter does not lie in the higher margin alone. Something else is involved—the merchandising characteristics of the commodity itself.

Cheese stocks turn over from 20 to 40 times annually. Milk, butter, and other perishables have a better record in this respect but cheese stands high on the list when all items in the store are considered.²³ Although the average sale appears to be $\frac{1}{2}$ pound of bulk cheese or one package (if prepackaged) the value of each sale is sufficiently high to require only a few sales to produce a dollar of gross revenue. This means that the share of the labor and the fixed charges of the store which are assigned to cheese will be smaller than those assigned to articles that move more slowly and are less valuable. The rapid turn-over, moreover, ties up fewer dollars in the inventory and lets those fewer dollars keep actively at work during the entire year.

Butter, by comparison, has a higher value and a higher weight per retail sale, it turns more rapidly, and it accounts for a smaller part of the total store-wide inventory. That is why the expense is less in handling butter than in handling cheese. At the same time, the gross margin taken on butter is less than that on cheese and so are the profits.

TABLE 43.—Relative importance of cheese sold by retailers in Louisville by types, 1928

Type	Percentage of total cheese sales	Annual tons	Percentage of sales		
			Gross margin	Expense	Net profit
Bulk natural					
Cheddar	24.06	70.5	31.9	14.4	17.5
Brie	17.69	35.0	31.6	11.3	20.3
Packaged natural	1.10	18.9	26.4	15.8	10.6
Bulk processed					
American	1.51	34.0	27.6	9.5	18.1
Pimento	9.08	42.9	25.7	11.7	14.0
Packaged processed					
American	.74	23.0	25.6	9.8	15.8
Pimento	2.27	18.0	22.5	10.0	8.5
Brie	1.09	20.4	24.1	13.7	10.4
Breads	5.87	25.4	21.2	11.7	11.5
Foreign types	13.69	21.0	25.1	12.5	12.6
Imported	2.24	14.0	34.8	13.2	21.6
Soft cheeses	15.32	55.4	25.4	16.1	12.3
Grated	.40	8.6	25.1	37.7	-12.9
Total	100.00	31.2	28.7	13.6	15.1

Abstracted from Bureau of Foreign and Domestic Commerce (52, p. 35).

Retail stores usually stock many kinds of cheese. The relative importance of each variety sold by retailers in Louisville in 1928 is shown in table 43. The so-called "store" cheese made up nearly 42 percent of the sales of all types and was equal to nearly two-thirds of the total when only American cheese is considered. During this

²³ The average turn-over of all items in Louisville grocery stores was 20.6 times per year; the turn-over for cheese for individual stores varied from 12.6 to 70.6 times annually, and averaged 31.1 times.

period processed cheese was manufactured in much smaller volume than in 1939 so that there has been some change in the relationship disclosed by this table. It is important to note, therefore, that the gross margin, the expense, and the profits, when all are expressed as percentage of sales, are larger for natural American cheese than for processed American cheese. With an increase in the retail sales of processed cheese, there should be some decline in all three items. However, such percentage figures can easily give an erroneous picture when the price per pound of cheese is not the same. When reduced to cents per pound, the gross margin for the American bulk cheese was 0.23 cent a pound more than the margin for processed American cheese in packages. The expense was 0.62 cent greater, but profits were 0.38 cent smaller.²⁴

The larger expense involved in handling bulk cheese by retailers is probably due to the additional labor in slicing and wrapping the consumer's order and to shrinkage in weight which takes place in the store after the cheese is cut and placed on display. Obviously, neither charge is important in connection with the handling of prepackaged processed cheese.

The increasing importance of processed American cheese compared with the cheese in its natural form, which has been one of the outstanding trade developments during the last 20 years, should have brought about a smaller gross margin on cheese, a reduction in the expense of handling it, and a smaller profit (all expressed in terms of percentage of sales), than those disclosed in a study of retail grocery stores in Louisville, from which all of the foregoing conclusions were drawn (54).

Although there is no assurance that the particular figures developed in the course of the Louisville study would be applicable in 1939, there is considerable reason to believe that the general merchandising characteristics of the commodity will have changed but little. Two tentative conclusions are drawn from the Louisville study, therefore: (1) Cheese may be expected to have a gross margin that is equal to or slightly in excess of the average gross margin of a store; and (2) cheese may be expected to earn a larger rate of profit than the store-wide average.

Data gathered in 1942 from several types of retail stores from which prices of natural cheese were obtained showed that the average margin was about 25.5 percent of sales (table 44). The independent stores doing a relatively small business had a gross margin of cheese very similar to the gross margin of the Louisville stores of about the same size. Moreover, as the store sales increase, the gross margin on cheese declines; it is smaller by about 5 percent of sales for the store with a total sales volume in the neighborhood of \$250,000 than for those with an annual volume of \$50,000, while the prices paid by the consumer average about 5 cents less per pound. Presumably there is considerable difference in the consumer services offered in the several stores and

²⁴ Using the percentage figures shown in the table and assuming that the price of bulk natural cheese is 24.1 cents and the price of packaged processed American cheese 5 cents more, comparative figures in cents per pound, would be:

	Gross margin	Expense	Net profit
Bulk natural Cheddar.....	7.69	3.47	4.22
Packaged processed American.....	7.45	2.85	4.60

there is no assurance that the cheese sold is exactly comparable; hence comparisons must be made with some care. At the same time, the average cost to the several types of retailers of the cheese sold is much more alike. Independent grocery stores paid about 27 cents a pound while chains and supermarkets were able to buy at only 2 cents less. As the retail price between the several types of stores differed by more than 5 cents a pound, the 3 cents smaller gross margin on which the larger stores worked had to be offset either by lower operating expenses or by smaller profits. Probably both kinds of adjustment took place.

The share the retailers claimed of the 1939 marketing margin of 12.4 cents per pound, which was given earlier, was based upon the average margin of 25 percent shown in this table. But as the average retail price during 1939 was estimated at 24.1 cents per pound, the actual margin, in terms of cents per pound, for this year, would be about 6 cents. Thus for each consumer dollar spent in 1939 for American cheese, 23.7 cents was claimed by retailers.

TABLE 44.—Retail price, cost, and gross margin of American cheese, by type of retail store, for 1 week in August 1942

Type of store	Retail price per pound	Cost per pound	Gross margin	
			Per pound	Percentage of sales
Independent:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	
Under \$20,000 annually	38.3	27.5	10.8	28.11
\$20,000 to \$50,000 annually	38.0	27.3	10.7	28.19
\$50,000 to \$250,000 annually	36.4	27.1	9.3	25.55
Chain under \$250,000 annually	32.2	24.5	7.7	21.82
Supermarket \$250,000 annually	32.8	25.4	7.4	22.62
Average	35.1	26.1	9.0	25.56

Office of Price Administration (Bureau of Labor Statistics Survey. [Unpublished].)

Using store-wide figures for independent stores as a rough yardstick, the distribution of the retailer's margin among various types of expenditures in retail stores is shown in table 29 (p. 47). But it has been pointed out that the profits earned on cheese may be expected to be somewhat higher than the average for the store as a whole and that the expense of handling cheese is less than the average. The distribution shown in the table, in consequence, underestimates retailer's cheese profits and assesses much too large a charge for expense. But in the absence of suitable data to show the true situation those contained in this table must suffice.

The items of considerable size in retail-store operation are the charges made for salaries and wages and for occupancy. Together they make up three-fourths of the gross margin taken on all sales; therefore, anything that will reduce the cost of these items of expense will contribute substantially to smaller margins in retail stores. Self-service is said to be one method of reducing expenses of this kind. The average margin of the 291 stores from which this expense distribution was made equaled 18.4 percent of sales, with more than two-thirds of these stores offering credit. The cost of credit, including losses in collection, can be as much as 4 percent of sales.

MARKETING MARGINS AND COSTS FOR EVAPORATED MILK

The retail price for unsweetened evaporated milk packed in 14½-ounce cans averaged 7 cents per can during the year 1939. For the quantity of milk needed to fill such a can the farmer received 2.54 cents. That is, the farmer received 36.3 percent of the retail price paid by the consumer and 63.7 percent, or 4.46 cents per can, represents the marketing margin left to be divided among the several marketing and processing agencies.

MARKETING CHANNELS

The channels through which evaporated milk flows into the hands of household consumers are pictured in figure 22. In most instances

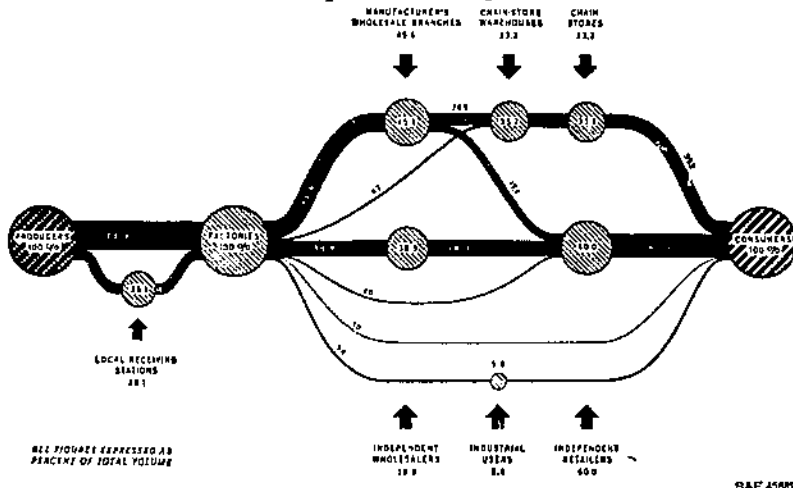


FIGURE 22.—Marketing channels for evaporated milk, United States, 1939.

fluid milk moves directly from the farmer to the condensery. There are notable exceptions, with the result that about 25 percent of the total volume passes through local receiving stations, where some reduction in bulk through preliminary condensation may occur.

There were 143 factories reporting the production of evaporated milk packed in cases in 1939, but the largest number of these factories was owned by a relatively few nationally known concerns. This concentration of ownership explains why nearly half of the evaporated-milk production moved directly to factory-owned wholesale branches for later distribution. But it is well to emphasize that about 40 percent of the total moved to independent wholesalers, mostly wholesale grocers.

Chain stores appear to make about one-third of the total sales of canned milk; they obtain the bulk of their supplies from the manufacturers' wholesale branch houses. Some of the chains own their own condenseries. The other avenues over which the product moves can be seen in figure 22. These relationships, based chiefly upon materials contained in the 1939 Census of Manufactures, are not greatly different from the results shown by the Federal Trade Commission with respect to 15 selected concerns handling evaporated milk a few years earlier (table 45).

TABLE 45.—Condensed and evaporated milk sales (case goods) of selected wholesale concerns, by types of purchasers, 1934-35

Type of purchaser	3 cooperative associations ¹	4 meat-packing companies ²	8 dairy companies ³	Total
	Percent	Percent	Percent	Percent
Grocers:				
Wholesale.....	45.0		46.3	41.5
Others ⁴.....			.2	.1
Chain stores.....	15.1	9.3	40.2	41.2
Independent and retail stores.....		65.8		5.7
Institutions and manufacturers.....	.3	29.3	.9	1.3
Others:				
Route customers ⁵	28.0		1.4	5.3
Not specified.....	6.7	.7	3.2	3.1
Government.....	4.9	4.9	1.8	1.8
Total.....	100.0	100.0	100.0	100.0

¹ Includes the following companies: Consolidated Dairy Products Co., Land O' Lakes Creameries, Inc., and Challenge Cream & Butter Association.

² Includes the following companies and their domestic subsidiaries: Swift & Co., Armour & Co., John Morrell & Co., and the Jacob Dold Packing Co.

³ Includes the following companies and their subsidiaries: National Dairy Products Corp., The Borden Co., Carnation Co., the Fairmont Creamery Co., Fat Milk Co., Golden State Co., Ltd., Creameries of America, Inc., and The Great Atlantic & Pacific Tea Co.

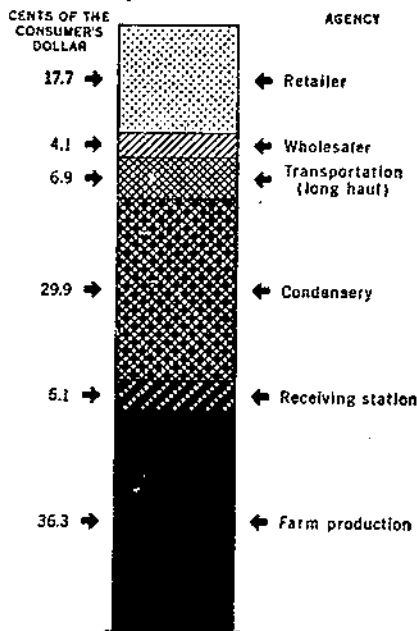
⁴ Includes brokers and commission houses.

⁵ Includes route sales to homes, and institutional users and to stores other than chain stores.

Federal Trade Commission (37); Adapted from tables 309 and 319.

DIVISION OF THE CONSUMER'S DOLLAR

The shares of the consumer's dollar spent during 1939 for evaporated milk that went to each of the agencies involved in the handling of this product are shown in figure 23.

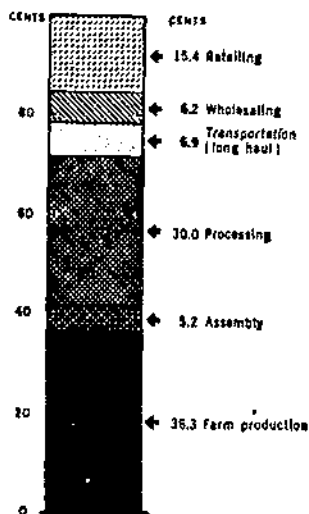


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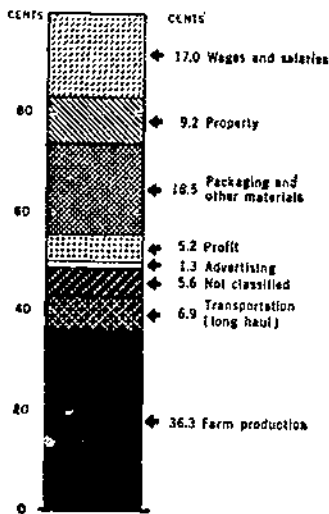
FIGURE 23.—Approximate distribution of the consumer's dollar spent for evaporated milk, by agencies, United States, 1939.

The condensery claimed about 30 percent of the consumer's dollar and with the exception of the share going to the farmer this is the largest share claimed by any one of the agencies. The shares of retailers and wholesalers, although smaller than those claimed by similar agencies handling fluid milk and American cheese, appear to be about the same as for butter. The cost of long-haul transportation is relatively high, being about 7 percent of the retail value. This is to be expected in view of the bulky character of the product.

The estimated division of the consumer's dollar according to marketing functions is shown in figure 24, but this arrangement discloses results which are little different from those of the previous chart.



DAE 45990



BAE 45990

FIGURE 24.—Approximate distribution of the consumer's dollar spent for evaporated milk, by functions, United States, 1939.

FIGURE 25.—Approximate distribution of the consumer's dollar spent for evaporated milk, by type of expense, United States, 1939.

The distribution of shares to claimants which brings out the type of expense involved in the handling of this product appears in figure 25.

The distribution of the expense involved in the handling and processing of evaporated milk shows results which depart considerably from those that have been disclosed in the case of the other dairy products. Noteworthy is the fact that the largest single item of expense turns out to be the charge for packaging and other materials, made up primarily of the cost of cans and their shipping containers. The expenditure for wages and salaries amounted to about 17 percent of the consumer's dollar. Advertising charges were a little more than 1 percent and profits are estimated at 5 percent of the retail price, a little less than that earned by cheese and more than double that earned by butter. Long-haul transportation charges paid by various agencies equaled about 7 percent and the remainder of the charges for local transportation of one kind or another is included in the other types of charges shown in the chart.

SUMMARY

The 1939 division of the consumer's dollar spent for fluid milk, butter, American cheese, and evaporated milk has been indicated in detail in the preceding sections. By way of summary, these results are brought together in tables 46 and 47. The former shows the division according to functions whereas the latter, detailing the type of expense, may help to explain the size of some of these functional charges.

The percentage break-down of the margin is emphasized in these tables and is compared to the break-down of the consumer's dollar or retail price. A particular component may represent a large share of a small farm-retail margin, but account for only a small part of the consumer's dollar.

TABLE 46.—Approximate distribution of the consumer's dollar and of marketing margin for fluid milk, butter, American cheese, and evaporated milk, by marketing functions, United States, 1939

Function	Fluid milk		Butter		American cheese		Evaporated milk		Four products ¹	
	Con- sumer's dollar	Mar- keting margin	Con- sumer's dollar	Mar- keting margin	Con- sumer's dollar	Mar- keting margin	Con- sumer's dollar	Mar- keting margin	Con- sumer's dollar	Mar- keting margin
	Cents	Percent	Cents	Percent	Cents	Percent	Cents	Percent	Cents	Percent
Retailing	27.3	61.1	12.9	36.1	24.1	46.9	15.4	24.2	22.6	51.2
Wholesaling	1.7	3.8	7.7	21.6	11.2	21.8	6.2	9.7	4.1	9.3
Transportation (long haul) .....	(?)	.....	1.4	4.5	1.2	2.3	6.9	10.8	1.0	2.3
Processing	0.6	21.5	10.0	28.0	12.9	25.1	30.0	47.1	11.3	25.6
Assembly	6.1	13.6	3.5	9.8	2.0	3.9	5.2	8.2	5.1	11.0
Total margin	44.7	100.0	35.7	100.0	51.4	100.0	63.7	100.0	44.1	100.0
Farm production	55.3	.....	64.3	.....	48.6	.....	56.3	.....	55.9	.....
Total con- sumer's dollar	100.0	.....	100.0	.....	100.0	.....	100.0	.....	100.0	.....

¹ Weighted average.

² No estimate for fluid milk.

Retailing and wholesaling services have been the subject of criticism for a long time, perhaps because they are carried on so obviously within range of the public eye. The charges during 1939 for these combined services in the case of the several dairy products range from 20 to 35 percent of the retail price. Butter and evaporated milk are often said to be handled on small margins, and that observation seems to be warranted by the present figures. In each instance, the share going for the combined retail-wholesale services is about 20 percent of their 1939 retail price. In contrast, the cost of retailing and wholesaling fluid milk is about half again as large. A total of 35 cents of the consumer's dollar is assigned to these functions in the case of American cheese.

In part, these differences in costs of distribution are due to the peculiar characteristics of the commodity itself; in part, they are due to the way the commodity is handled and priced. Merchants' stocks of butter and evaporated milk turn over readily, they are in continuous demand, and they require a minimum of handling. Moreover, the margin of these two items seems to be smaller than the margins of many other products handled by storekeepers. But cheese carries

wider margins and is priced to earn larger profits. The unique practice of delivering fluid milk to the homes of individual consumers is well known and helps to explain the high distribution charge for this product.

The portions of the consumer's dollar going for the processing of fluid milk, butter, and American cheese all lie in the neighborhood of 10 percent. The initial steps involved at the factory in handling milk, as it comes from the producer, are much the same whether that milk is to be sold as fluid milk or made into butter or cheese. The condensery, on the other hand, is much more elaborately equipped than the plants which are engaged in the production of fluid milk, butter, or cheese. The portion of the consumer's dollar going for processing evaporated milk is nearly three times as large as that for the other dairy products. In fact, the charge for this manufacturing service accounts for nearly one-half of the total marketing margin.

The charge for local assembly, as the term here is used, includes the costs of gathering milk and cream and the local handling charges paid by the buyer of the farmer's milk in all cases except for cheese, where it refers to the charges of those specialized warehousemen known as assemblers. The average assembling charge was estimated at 5 percent of the consumer's dollar spent for the four dairy products. This figure may be too low, for some of the charges for this service may be included as a joint operation within one of the other classifications of the table.

It should be made clear that in those numerous instances in which the farmer himself pays the cost of local transportation no charge whatsoever is made against the marketing margin. This is an example of the general rule that the size of the marketing margin depends on who pays the bills. If a great deal of service is required of marketing and processing agencies then the tendency is for the marketing margin to widen. Obviously, the most direct method of simply reducing the size of the marketing margin would be to cause either the consumer or the farmer to assume the cost of a service previously paid for by one of the marketing agencies. The marketing service would continue, but it would no longer be performed by a specialized marketing agency. This would produce an apparent but misleading economy which actually does not reduce costs of performing specified services, but merely reduces the quantity of services accounted for in the margin.

On the other hand, the margin may be expected to widen when marketing or processing agencies are obliged to perform services and to assume charges previously borne by the farmer or the consumer. Two changes of this kind have taken place within recent years. Local milk plants, in exercising more control over hauling arrangements, have come to pay an increasing part of the local in-bound trucking bills previously paid by the farmer. Therefore, the tendency has been for the part of the consumer's dollar going for the assembly service to increase. In the future, further increases in this share would seem to be forthcoming. A change with opposite results is traceable to the rise of the cash-and-carry, minimum-service retail concern which has saddled upon the consumer himself charges previously included in the marketing margin. In consequence of the latter trend, the size of the marketing margin has had some opportunity to shrink. But whether the marketing margin with respect to a

particular commodity does shrink depends in part upon the pricing practices of wholesale and retail merchants who handle the product. These merchants must stand or fall on the results of their storewide operations and a particular commodity plays a small part except in those few instances in which the merchant specializes in handling the one product.

A second general method of shrinking the marketing margin is to reduce the shares going to individual claimants. The residual portion above total costs remaining in the hands of merchants and manufacturers, here called profits, appears to be small. The overwhelming part of the gross receipts of such agencies—their operating costs—goes to satisfy the claims of others. The marketing margin will contract if these claims are made smaller. But in the case of dairy products, it would seem that these claims have expanded over the years to a considerable extent, because of the insistent demand for products of higher quality. The day of the open milk pail, of distinctly off-flavored butter, perhaps even of bulk cheese, seems to have been left far behind. The quality goal is expensive to attain and continued insistence upon further improvement must invite a further widening of the marketing margin to pay for additional services required. Really wasteful practices and inefficient operations can be eliminated with some savings, but the sweep of the tide is in the opposite direction.

It is apparent from the details with respect to expenditures summarized in table 47 that the marketing agencies are but momentary custodians of the funds they receive from the sale of the product. Wages and salaries represent a major claim against these funds although the exact share of the consumer's dollar spent for each product claimed by wages and salaries is widely different. The smallest relative share is recorded for butter, 12.9 cents, and the largest for fluid milk, 26.1 cents.

The importance of labor costs as wages and salaries in total marketing charges for dairy products is brought out strikingly in table 47.

TABLE 47.—Approximate distribution of the consumer's dollar and of marketing margin for fluid milk, butter, American cheese, and evaporated milk, by type of expense, United States, 1939

Type of expense	Fluid milk		Butter		Cheese		Evaporated milk		Four products ¹	
	Con- sumer's dollar	Mar- keting margin	Con- sumer's dollar	Mar- keting margin	Con- sumer's dollar	Mar- keting margin	Con- sumer's dollar	Mar- keting margin	Con- sumer's dollar	Mar- keting margin
	Cents	Percent	Cents	Percent	Cents	Percent	Cents	Percent	Cents	Percent
Wages and salaries	26.1	58.4	12.9	36.1	22.8	44.4	17.0	20.7	21.8	49.4
Property	6.0	13.4	4.2	11.7	8.3	16.1	6.2	14.5	5.9	13.4
Supplies	5.6	12.5	3.2	9.0	4.2	8.2	18.5	20.0	5.8	13.1
Other	2.8	6.3	11.6	32.5	7.9	15.4	5.0	8.8	5.6	12.7
Advertising	0.9	2.0	(?)	(?)	(?)	(?)	1.7	2.0	.6	1.4
Profits	3.3	7.4	2.2	6.2	7.0	13.6	5.2	8.2	3.4	7.7
Transportation (long-haul)	(?)	(?)	1.6	4.5	1.2	2.3	6.9	10.6	1.0	2.3
Total income	44.7	100.0	35.7	100.0	51.4	100.0	63.7	100.0	44.1	100.0
Farm production	55.3		64.3		48.6		36.3		55.9	
Total con- sumer's dollar	100.0		100.0		100.0		100.0		100.0	

¹ Weighted average.

² No estimates.

There each cost item is expressed as a percentage of total costs and profits included in the margin for all marketing operations.

Nearly 60 percent of the marketing margin for fluid milk is devoted to the bill for wages and salaries. This is a direct reflection of the vast amount of labor involved, as the system now operates, in delivering milk to individual consumers. The importance of wages and salaries in the margin drops to its lowest significance at 26.7 percent for evaporated milk.

Property expense is surprisingly low—less than 10 percent of the retail price of the product and not far from 15 percent of the total marketing margin.

The cost for supplies, largely for containers, amounted to about 5 percent of the consumer's dollar, a little less for butter than for American cheese and fluid milk. In the case of evaporated milk it was the largest single item of expense. For evaporated milk, the share for supplies was equal to about one-fifth of the consumer's dollar and one-third of the marketing margin. It appears to be larger even than the wage-and-salary bill.

Profits, after all charges were deducted (except taxes on profits or income), amounted to about 2 cents of the consumer's butter dollar, 3 cents of the fluid-milk dollar, 5 cents for evaporated milk, and 7 cents for cheese. Out of the sum set aside as the marketing margin, profits claimed from 6 to 8 percent except in the case of American cheese where it made up nearly 14 percent of the margin.

The marketing margin during 1939 was 44.7 percent of the consumer's expenditure for fluid milk, 35.7 percent for butter, 51.4 percent for American cheese, and 63.7 percent for canned milk. However, the four dairy products are not of equal importance to consumers, for they buy much more of one product than of another. To get this matter into focus it is essential to know what was the annual money value in the family market-basket of marketing margins shown in tables 46 and 47. That is, at the prices which prevailed in 1939, just how many dollars did these services and costs amount to per family?

TABLE 48.—Approximate distribution of charges for marketing annual family purchases of fluid milk, butter, cheese, and evaporated milk, by function, United States, 1939¹

Function	Fluid milk		Butter		Cheese		Evaporated milk		Total of 4 dairy products	
	Margin ²	Percentage of total margin	Margin ²	Percentage of total margin	Margin ²	Percentage of total margin	Margin ²	Percentage of total margin	Margin ²	Percentage of total margin
	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent
Retailing	7.96	61.0	1.57	35.1	0.65	46.9	0.19	21.2	10.70	51.3
Wholesaling	.50	3.8	.94	21.5	.31	21.8	.20	9.7	1.95	9.3
Processing	2.80	21.5	1.22	28.0	.36	25.1	.09	47.1	5.34	25.6
Assembly	1.78	13.6	.43	9.3	.06	3.9	.17	8.2	2.43	11.6
Transportation (long-haul)	(0)		.20	4.5	.03	2.3	.22	10.8	.45	2.2
Total marketing charges	13.03	100.0	4.36	100.0	1.44	100.0	2.04	100.0	20.87	100.0
Retail cost	28.91		12.22		2.79		3.21		47.13	

¹ Total marketing charges calculated for 1935-39 average annual purchases per family of three (253.6 quarts fluid milk, 39.3 pounds butter, 11.6 pounds cheese, and 43.0 14½-ounce cans evaporated milk) and computed from data in United States Department of Agriculture (55).

² Total marketing charges were distributed by percentages shown in table 46.

³ No estimate.

TABLE 49.—Approximate distribution of charges for marketing annual family purchases of fluid milk, butter, cheese, and evaporated milk, by type of expense, United States, 1930¹

Type of expense	Fluid milk		Butter		Cheese		Evaporated milk		Total of 4 dairy products	
	Margin ²	Per-centage of total margin	Margin ²	Per-centage of total margin	Margin ²	Per-centage of total margin	Margin ²	Per-centage of total margin	Margin ²	Per-centage of total margin
	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent
Wages and salaries	7.01	56.1	1.57	36.1	.64	44.4	0.55	20.7	10.37	49.4
Property	1.75	13.4	.51	11.7	.23	16.1	.20	14.4	2.78	13.4
Supplies	1.03	12.5	.39	9.0	.12	8.3	.59	29.1	2.73	13.1
Other	.82	6.3	1.42	32.5	.22	15.1	.18	8.9	2.64	12.7
Advertising	.26	2.0	(?)	(?)	(?)	(?)	.04	2.0	.30	1.4
Profits	.90	7.4	.27	6.2	.20	13.6	.17	8.2	1.60	7.7
Transportation	(?)	(?)	.20	4.5	.03	2.3	.22	10.8	.45	2.3
Total market- ing charges	13.03	100.0	4.36	100.0	1.44	100.0	2.04	100.0	20.87	100.0
Retail cost	28.91		12.22		2.79		3.21		47.13	

¹ Total marketing charges calculated for 1935-39 average annual purchases per family of three (253.6 quarts of fluid milk, 30.7 pounds of butter, 11.0 pounds of cheese, and 45.9 14½-ounce cans of evaporated milk) and computed from data in United States Department of Agriculture Misc. Pub. 576 (63).

² Total marketing charges were distributed by percentages shown in table 47.

³ No estimates.

The results of calculations designed to answer this question are shown in tables 48 and 49. The "percentage of total margin" shown in these tables is identical with similar percentages shown in tables 46 and 47. The "margin" in tables 48 and 49 is simply the corresponding margin per unit of product, presented in earlier sections of this report, multiplied by the number of units representing annual purchases per family of three. The amounts of these purchases are listed in footnote 1 of the tables. Both tables 48 and 49 also show the total amount of retail cost per family for each of the four principal dairy products and the group of four products combined.

For the family market basket the 1930 value of the marketing margin was as follows: Fluid milk, \$13.03; butter, \$4.36; evaporated milk, \$2.04; cheese, \$1.44. The sizes of the dollar charges per family for each service and each item of cost are shown in the tables. From these comparisons, it is apparent that a reduction in marketing margins of, for instance, 10 percent, and an equivalent reduction in retail prices, would effect large family savings on fluid milk purchases. These savings would be 10 times as large on fluid milk as on American cheese and three times as large as on butter. Presumably, this dominant position occupied by fluid milk among the dairy products in terms of total marketing charges provides a reason why students have devoted so much attention to fluid milk and have pushed proposals for changes in practices connected with its handling.

The annual charge made against the market-basket family for the retailing and the wholesaling of fluid milk amounts to \$8.46 (table 48). The total charge for these services for the four major dairy products was \$12.65. The relatively simple tasks involved in processing the quantity of fluid milk purchased by the market-basket family costs \$2.80, which is three times as much as the cost of the elaborate steps involved in condensing the smaller quantity of milk purchased as evaporated milk. With but one exception, for every function listed

in the table with respect to fluid milk, an annual expenditure of at least a dollar is required of the market-basket family, and some require several dollars. In contrast, only two of the functions—retailing and processing—as they apply to butter have an annual charge that exceeds a dollar and there is no single charge even that large in the case of cheese or evaporated milk.

The break-down of total annual marketing charges per family for the four major dairy products is presented in table 49 in terms of type of marketing expense, such as wages and salaries, supplies, etc. Under wages and salaries, for example, this table shows the number of dollars which this family paid in 1939 to cover the labor costs of marketing these four products. The size of the wage and salary bill for fluid milk is outstanding, and no single charge shown elsewhere in the table approaches it. The wages and salaries item for fluid milk alone accounts for more than one-third of the total marketing margin for all four of the principal products combined. Total profits in the marketing of these milk products in 1939 amounted to \$1.60, of which 96 cents was the profit for fluid milk. Profits amounted to only 20 cents for cheese and 17 cents for evaporated milk. All these specific charges for marketing operations are included in the retail cost per family of \$47.13, of which \$20.87 was the total charge for marketing the four dairy products.

From discussion in earlier portions of this publication, it may be concluded that it is from fluid milk that the most significant marketing economies may be expected. Some of these economies have already been partially realized through wartime emergency measures designed to reduce costs and save in the use of manpower and equipment. Added significance is given this prospect by the comparisons shown in tables 48 and 49, which demonstrate that a small saving in marketing charges for fluid milk may be of greater importance per family than a relatively much larger saving in the marketing of the other three major products. However this does not mean that marketing problems for products other than fluid milk may be neglected. There are a variety of additional dairy products other than these four the total importance of which in terms of retail cost to consumers is about two-thirds that of fluid milk.

It must be admitted that merely stating the percentage shares of the claimants of the marketing margin may tend to overemphasize the importance of certain individual charges. However, when these shares are expressed in dollar values, applying to annual purchases by the market-basket family, the conclusion may be too readily formed that in most instances the aggregate annual cost for any item is exceedingly small and that the matter of marketing margins must be of trifling consequence. There is merit in both of these positions but there is likewise error. The balance probably lies somewhere between the two. At the same time, the record of performance, when measured by the size of the marketing margin for the dairy-products group as a whole, is superior to that of most other food groups. The size of the marketing margin for all foods in the market basket amounted to about 60 percent of the 1939 retail value, and for the dairy group as a whole that margin averaged about 50 percent. The size of the marketing margin for the two most important dairy products (fluid milk and butter) was even smaller. Although size of

the marketing margin is no proper indication of the potentialities of that margin to yield further savings, it is also true that a small gap between the farm and the retail price is generally capable of yielding less ground than is a large one.

Whatever may be the postwar developments in building a more efficient marketing system for dairy products, this report provides an industry-wide prewar basis for comparison. Future progress may well be measured from the situation in 1939, avoiding the transient distortions of the war years.

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