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PLANT OPERATING EFFICIENCY IN THE MARKET MILK INDUSTRY

by

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## PLANT OPERATING EFFICIENCY IN THE MARKET MILK INDUSTRY

J. M. Tinley

The purpose of this paper is to present briefly some aspects of one important factor which, while it has been publicized widely and often loosely in the press, has not received the attention from economists it appears to merit. Reference is to the position of distribution (processing and delivery) in the market-milk industries 1/ of the various cities.

An examination of the beginning and course of milk wars during the years 1930 to 1935 and of the efforts of state and federal authorities to stabilize conditions in individual markets seems to warrant the following conclusions:

(1) Although policies followed by producers' associations may have contributed to conditions leading to milk wars, these were in most instances a struggle among individual distributors to increase or maintain volume of output. Milk wars might more aptly be called "milk distribution wars." While producers shared largely in the resulting financial losses, they were more in the position of victims than combatants.

(2) Even in 1929 the milk distributive systems in many of our larger cities were oversupplied with processing capacity, and were overcapitalized.

(3) In many important milk markets in the country the number of separate distributing agencies increased in the face of a limited and often declining total volume of consumption.

(4) The small degree of success that attended federal and state stabilization efforts was due largely to the fact that no practical methods were (or could be) developed to immediately cope with the conditions resulting from the struggle among distributors for increased volume.

(5) While the pressure upon public authorities to institute and enforce marketing agreements and licenses has decreased with the general economic improvement, the condition of the distribution systems in many of the larger cities is such as to make further milk wars inevitable should business conditions again decline.

General Economic Considerations.-- These conclusions are not intended as a criticism of policies of distributors, but merely as a statement of what appear to be inescapable facts. Similar conditions of overexpansion and inefficiency are found in large numbers of other important industries in the United States. In fact, we are so accustomed to such conditions that we have come to regard them as a matter of course -- an inevitable consequence of economic progress.

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1/ As used in this paper the term "distribution" as applied to market milk covers the two separate functions, processing and delivery, both of which are usually performed by the same agency -- the market-milk distributor or dealer. The term "market-milk industry" refers to the systems of distribution in each city. There are many common problems as well as differences in the market-milk industries of various cities.

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The problem of industry operating efficiency in reality has two distinct, though closely related, phases. The first embraces the factors influencing the internal operating efficiency of individual plants measured in terms of input per unit of output (physical) or costs per unit of product; 2/ the second deals with the correspondence between the combined capacities and output of all plants operating in an area or industry. For an industry to be efficiently organized it is necessary that (1) individual plants be operated at as near maximum efficiency as possible, (2) the combined capacities of all individual plants be coordinated closely with available supplies of raw materials or with potential market outlets, and (3) the industry be supplied with adequate capital to provide the necessary processing facilities and to finance operations.

It would seem that an explanation of the reasons for industry inefficiency is to be found in the imperfect functioning of our economic machinery. It has been assumed that the force of competition would automatically insure that each industry would operate efficiently, the inefficient firms being rapidly and surely forced out of operation. Furthermore, it has been assumed that competition would cause the benefits of technological improvements to be widely dispersed among consumers generally in the form of lower prices or costs of service or in the form of higher wages or shorter working hours. For a number of reasons, which will not be enumerated here, the competitive force has been so curtailed that it has failed to perform this automatic function. Many of the benefits of technological improvements have been highly concentrated. Indirectly a large part of these benefits have been reinvested in individual industries causing them to become periodically oversupplied with processing facilities. 3/ From the more restricted viewpoint of individual industries as well as from a broad social viewpoint, this tendency for periodic overexpansion of processing capacity has important economic implications.

Capital is invested in processing facilities in anticipation that it will earn a return (interest or profit) for the investor. In order to earn a return, the facilities must be used to produce goods or services which can be sold. If new capital is invested in an industry which is already adequately supplied with facilities, the result, as far as the industry as a whole is concerned, will merely be the creation of facilities which cannot be used or which supplant other facilities previously in use. A part of the capital in industry will thus be wasted, or the level of return on all capital invested in the industry will be reduced. Some excess capacity is normally necessary in all industries as a margin of safety in case of temporary breakdown of some operating units, to meet occasional peak loads, and to provide for future expansion. Even if due allowance is made for such necessary excess capacity, many industries will be found with capacity far

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2/ There are several other measures of operating efficiency such as cost per unit of sales or profit per unit of invested capital.

3/ Because of the concentration of benefits of technological efficiency there has also been a tendency for industries to be oversupplied with capital. (Refinancing of corporations with increase in capital stock and bidding up of stock.)

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in excess of what is necessary to care for exceptional needs and expansion. Such unnecessary excess capacity is about as useful as milk plants at the South Pole or service stations in the Sahara Desert.

From a broad national welfare viewpoint the problem is even more serious. Many prominent economists maintain that the tendency for large groups of industries to become periodically overexpanded and overcapitalized in relation to the trend of buying power is one of the main causes of business depressions. The disastrous effects upon national welfare of such overexpansion are likely to be more serious in the future if it is true that the United States has passed from a state of industrial adolescence to industrial and financial maturity.

The welfare of individual industries and of the nation as a whole requires that effective machinery be developed to insure that each industry is supplied with adequate, but not superabundant, capital and that each industry is efficiently organized and operated. More attention will have to be given by those engaged in individual industries to the reasons for overexpansion, overcapitalization, and lack of efficient organization and operation of individual plants. This problem appears to be particularly important in the market-milk industry because of the intense public interest in the distribution of market milk. Milk is an essential article of food for rich and poor -- a vital necessity for infants and children. Thus while many other industries appear to be more inefficient than the milk industry, they do not arouse the intense public interest that the milk industry does. If distributors in individual cities do not or are unable to improve the efficiency of their industry, they are likely to experience increased public control or efforts to force reorganization. 4/

Many of us view with considerable misgiving the tendency towards increased public regulation of industry. Yet such regulation appears inevitable unless those engaged in individual industries can themselves develop effective machinery perhaps with public assistance to increase the efficiency of their own industries. The whole problem should be approached objectively and from a broad industry standpoint. This approach towards the rationalization of individual industries is somewhat new in this country, although considerable progress along this line has been made in several European countries.

If such an approach is to be possible in the market-milk industry, it will be necessary to gather a considerable amount of factual material concerning (1) the importance of the various factors influencing the efficiency of operation of individual plants, especially the importance of size of plant, and (2) the reasons for inefficient industry organization. It will also be necessary to develop measures of plant capacity and industry efficiency.

Plant Operating Efficiency.--- As recently as the beginning of the World War market milk was handled almost entirely by hand. There were few mechanical devices and milk was distributed by a large number of small concerns

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4/ Similar developments are not unlikely in other industries as well. The difference is one of urgency, not of kind.  
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or by producers. In contrast, a modern milk plant is very completely mechanized. This transition has had two important economic results. First-ly, the amount of direct human labor necessary to handle a given volume of milk has been greatly reduced; or conversely, a much larger volume of milk can now be handled per employee. <sup>5/</sup> Secondly, the volume of milk that can be handled conveniently and economically in a single plant has been increased greatly.

In most highly mechanized industries it is found that volume of output is one of the most important single factors influencing the efficiency of individual plants. Hypothetically, the relation between capacity, volume of output, and unit operating costs would be as depicted in figure 1. The capacity of a plant is usually increased by installing one or more additional units of certain types of machinery at a time. If only one unit of machinery, with a capacity of 1,000 units of product, were installed, the relation of output to costs per unit of product would be as depicted by the first small solid curve in the figure. The lowest cost per unit of product (or most efficient use of the single unit of machinery) would be obtained with an output of 1,000 units. Thereafter, due to overworking of the machinery, costs per unit would tend to increase. If a second unit were added, the cost per unit of output of operating both units together would be as depicted in the second solid curve and so on until 5 units of machinery in all were installed. Thereafter, due to a number of reasons, which will not be enumerated here, costs per unit of output would tend to increase if additional units of machinery were added and volume of output increased. In this illustration the most efficient sized plant (or optimum size plant) would be one with 5 units of machinery and the point of optimum efficiency would be reached when all 5 units were operating to capacity.

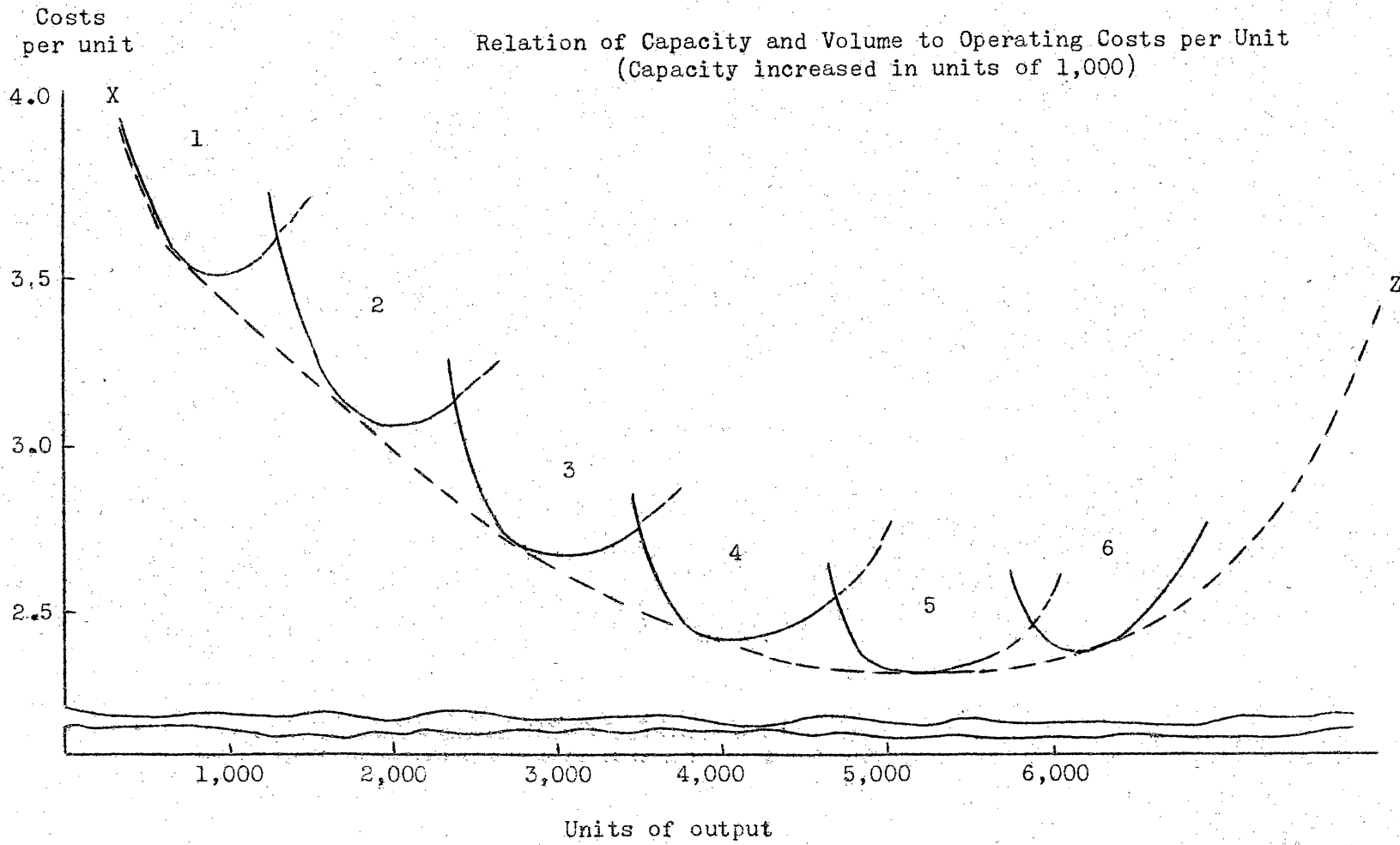
In most industries it is somewhat difficult to determine just what is a plant of optimum size partly because (1) individual plants will be found to have a wide variety of capacities and outputs, (2) several other factors influence unit processing costs, and (3) the point of optimum efficiency is subject to change as new machinery and new processing techniques are introduced. Thus it may be found that a plant with 4 units of machinery may have higher unit processing costs than a plant with only 3 units. This may be due to the fact that the smaller plant is fully utilizing all its capacity, whereas the larger plant is using only a part of its capacity. Or the reason may be that one plant is new, well arranged, with up-to-date equipment, whereas the other plant may have been organized originally to handle a much smaller volume. As output expanded additional units of machinery were crowded into the old building. The machinery and equipment may be poorly arranged and much of the equipment relatively inefficient. <sup>6/</sup>

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<sup>5/</sup> This increase in volume per employee is not as great as is often pictured, because sight is lost of the labor indirectly employed in making machinery. There has also been a counter tendency. Labor is now used to perform services previously unknown and also to perform functions necessitated by more stringent sanitary requirements. Some of the machinery introduced is also for the purpose of safeguarding health.

<sup>6/</sup> Other factors which may influence unit operating costs are type, construction, and original cost of buildings, machinery and equipment, wages, cost of supplies, and so on. In many instances variations in accounting practices, especially cost allocation methods, may account for what appear to be differences in unit processing costs.

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Unfortunately very little comparable data are available as to factors influencing unit costs of processing market milk. Some data are available as to distribution costs in some markets, but these have been prepared for other purposes, <sup>7/</sup> and are not sufficiently detailed to throw much light upon the problem of efficiency. It is difficult to so correlate the information in these various studies as to determine the influence of volume and other factors upon unit processing costs or to ascertain the behavior of different items of costs (labor, fuel, depreciation, etc.) with varying volumes of output. Other studies have shown that some cost items remain relatively constant regardless of volume, others decrease for a while and then increase rapidly with increase of volume, whereas others continue to decline almost indefinitely as volume is increased. The relative importance of these various cost items and their behavior with changes of volume determine the shape of the total cost curve.

It is often claimed that a small plant may be operated just as efficiently as a large plant. Is it true that volume of output is an efficiency factor of minor importance in the processing of market milk? Isn't it possible that associated with size there is often poor arrangement of plant and equipment and old machinery? Many small plants are new and well arranged. Many old plants are like Topsy -- they just grew. It is also contended that size is of little importance, because in any case processing costs account for 40 per cent and less of the total costs of retail distribution and in most cases vary from only say 2.5 to 3.5 cents. While the absolute variation may be small in cents, the percentage variation is great. Also there is no assurance that the lower figure in any market represents the minimum possible processing costs with the most efficient possible type of plant.

Delivery Efficiency.-- It would seem that the opportunities for reduction of unit delivery costs with large volume per delivery unit are more limited than in the case of processing costs. There are definite limits to the volume that can be handled per truck or per delivery man. Within these limits, however, there is room for wide variations of delivery costs depending upon the number of points carried per truck, type of equipment used, miles traveled, etc. Under actual operating conditions a greater absolute difference is usually found between high and low retail delivery costs than in processing costs. This is due partly to the fact that delivery costs account for a proportionately larger share of the total costs of distribution and partly to the fact that there are wide variations between the number of points carried per delivery wagon, in type of equipment used, and in deliveries per stop and per mile.

Even in regard to this function the advantage appears to rest with plants handling a large volume. They are in a better position to so arrange their delivery routes over a period of time as to insure delivery of the largest number of points per truck, per mile, and per labor hour.

There are other costs indirectly associated with delivery such as selling, consumer contact, and advertising which should be considered in conjunction with delivery costs. These costs per unit seem to be amenable

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<sup>7/</sup> For example, Spencer's study of research in costs of distributing milk. Jour. Farm Econ. 17 (2):338-351. 1936.

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to considerable reduction with increased volume. This phase of distribution is usually the one which arouses most public interest. The overlapping of delivery routes, even in outlying scattered delivery areas, is patent. Very important reductions in distribution costs could undoubtedly be effected, if there were fewer and larger plants and if overlapping can be reduced to a minimum.

Industry Efficiency.-- The problem of industry efficiency is to so coordinate all phases of the handling of milk in a particular market as to insure the lowest possible unit operating costs. This involves consideration of procurement <sup>8/</sup> as well as processing and delivery costs. With knowledge of the factors influencing unit costs of distribution, it would be necessary next to analyze the actual relation between the combined capacity and output of all plants in the market and the total peak load of distribution for the market as a whole and also to determine clearly the reasons for the present condition of affairs.

If data relative to the capacity and volume of output of individual distributing plants could be obtained for a large number of cities, the actual organization of market-milk distribution in individual cities would be found to conform to the general pattern shown in table 1. In this illustration it is assumed that 100,000 gallons of milk are distributed daily and that the optimum size of plant would be 25,000 gallons. Under an ideal system of distribution 4 plants of optimum size would handle all the milk distributed. Actually, however, it would be found that very few, if any, plants in a market are of optimum size; the capacity of the majority of plants is well below optimum size; very few plants are operating to capacity, and finally, the combined capacities of all plants operating in an area are greatly in excess of the total volume of milk being distributed daily.

In the study of the milk market of the cities on the east side of the San Francisco Bay, <sup>9/</sup> it was found that the combined capacity of 20 plants in 1930 was 85,000 gallons, whereas the peak volume of milk distributed in the area was 35,000 gallons. In 1935 the number of plants had increased to 30 while the total volume distributed daily had declined nearly 10 per cent. Similar conditions exist in practically every other major milk market in California, and probably in numerous cities in other states. There was a considerable excess of capacity in 1930 and the position had become still less favorable in 1935.

It is probable that a similar excess of capacity existed in 1930 in respect to delivery equipment. Many firms had delivery routes with too small a number of points and in addition individual routes covered too wide a territory. The decline in efficiency of utilization of delivery equipment between 1929 and 1935 was as great, or greater than, the decline in the utilization of processing capacity. It is difficult for a distributor to rearrange his routes even if the volume of sales decreases materially. Individual routes would continue to be operated at higher unit costs. In fact, costs of selling and delivery may be increased still further, if distributors attempt to maintain sales by intensified advertising and selling activities.

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<sup>8/</sup> In many markets procurement or collection and hauling of milk to city plants is very inefficient, especially where country assembly plants are operated. Material reductions in procurement costs could undoubtedly be secured in many markets, if the procurement function could be rationalized.

<sup>9/</sup> Tinley, J. M., and Martin H. Blank, An analysis of the East Bay milk market. California Agr. Exp. Sta. Bul. 534:1-110. 1932.

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TABLE 1

Ideal and Actual Organization of Distribution in  
a Hypothetical Milk Market

Ideal organization:

Peak daily production	=	100,000 gallons
Optimum size plant	=	25,000 gallons
Number of optimum size plant necessary	=	4

Actual organization:

Plant No.	Capacity	Output
1	20,000	15,000
2	20,000	13,000
3	15,000	10,000
4	15,000	8,000
5	15,000	7,000
6	15,000	7,000
7	10,000	6,000
8	10,000	5,000
9	10,000	4,000
10	5,000	4,000
11	5,000	3,000
12	5,000	3,000
13	5,000	2,000
14	5,000	2,000
15	5,000	2,000
16	3,000	2,000
17	3,000	1,000
18	3,000	1,000
19	3,000	2,000
20	2,000	1,000
21	2,000	1,000
22	1,000	600
23	1,000	400
Totals	180,000	100,000

Why are the distributive systems of so many of our larger cities inefficiently organized from an industry viewpoint? If volume of output is an important factor in reducing unit processing and delivery costs, why do not operators of small plants or of plants with unused capacity expand their output?

In most industries there are fairly definite limits beyond which the combined output of all plants cannot be expanded. These limits are determined either by the source and density of supplies of raw materials (or other factors of production) or by the potential market outlets. For instance, in isolated butter manufacturing areas the output of all plants combined is limited by the supplies of milk fat produced in the surrounding territory. In most milk markets there are usually ample supplies of market milk. The limiting factor at any one time is the volume of milk consumed by the population of the market area. Neither the size of the market nor the per-capita consumption in that area can be increased at short notice.

Each individual distributor thus finds his ability to increase his output conditioned and circumscribed by competition with other distributors in the same area for a share of a limited market outlet. Unless the total volume of milk distributed in the area increases, any increase in the output of a single distributor must be at the expense of other distributors in the market.

There appear to be four methods by which individual distributors can attempt to expand their volume of output.

(1) Increased Advertising and Selling Activities.--- During the past decade or two this has become one of the most common methods adopted by individual operators to increase volume of sales. Except for the value of advertising in increasing the total volume of consumption, this method has two distinct disadvantages. Other operators can adopt similar measures and an immediate increase in total distributing costs results. Unfortunately a good deal of advertising of brand names appears to have had a negative result in that individual distributors in placing their brand names before the public have implied that the milk handled by their competitors is of poor quality. This has tended to create a distrust in the minds of consumers as to the purity of all milk. Advertising and educational work of dairy councils has undoubtedly been a factor in increasing the consumption of market milk but it has not resulted as a rule in differential benefits for individual distributors.

(2) Quality and Services.--- A decade or two ago the improvement of quality was undoubtedly an important means of increasing sales. At the present time, however, the relatively rigid sanitary requirements enforced in nearly all important milk markets are a guarantee of the quality of the milk handled by all distributors. The rendering of additional services has the same disadvantages as increased advertising. The practices adopted by one distributor increase his expenses and, moreover, can be adopted by his competitors.

(3) Price Cutting.--- The introduction of labor-saving machinery in market-milk distribution has undoubtedly resulted in some increase in efficiency per employee and hence should have been accompanied by a decrease in

unit costs of distribution and in distributors' margins. <sup>10/</sup> Actually, however, distributors' margins have not declined to any extent over the past decade or two. If anything, they have tended to increase. Unfortunately improvements in individual types of machinery, while marked in the aggregate over a period of time, were of only minor importance in any one year in decreasing unit operating costs. For example, let it be assumed that over a period of 10 years, improvements resulted in a full cent decrease in unit operating costs. During any one year, however, the effect on costs may not have exceeded 1/5 of a cent.

In the market-milk business prices to consumers are usually changed 1 cent at a time. The margin of profit plus the saving per quart in any one year would be too small to permit a full cent decrease in the retail price. Such a decrease would probably convert a profitable business into a losing proposition. As a result, very little if any of the improvements in technological efficiency in the market-milk business were passed on to consumers in the form of lower prices. A part may have gone to labor in the form of higher wages. The bulk went to increase returns on operating capital, and was in a number of instances capitalized in increased issues of stock or used for purposes of expanding facilities.

Another development, characteristic of industry generally, during the 20's tended to prevent benefits of technological efficiency in the market-milk industry from being reflected in the form of lower prices -- the emphasis placed on stabilized (administered) prices. In a large number of milk markets retail prices remained practically unchanged between 1922 and 1929. The increase in population as well as per-capita consumption resulted in a continual expansion of the total volume of milk consumed in individual markets at the stabilized prices. As all distributors shared in this increase there was little incentive to reduce prices.

(4) The Merging of Plants.--- Up to 1929, apart from the general increase in consumption of milk, most increases in volume per plant resulted from what is known as the consolidation or merger movement. Large and financially strong distributing concerns bought out and closed down several smaller plants. The milk previously handled by the smaller plants was concentrated in one large plant. This undoubtedly resulted in a material decrease in the unit costs directly incurred in distribution. However, as retail prices were not decreased the benefits of such consolidation were largely capitalized or resulted in an enhanced return on capital invested.

During the period 1922 to 1929 the total volume of milk distributed in each market increased substantially whereas the combined capacity of individual plants showed some decline. This resulted in a more efficient utilization of physical facilities. In the face of this development the investment of capital in the market-milk industry increased materially. In the merger movement the larger distributing concerns purchased not only the tangible net assets of the smaller plants which were closed down, but also paid substantial sums for goodwill (table 2). Thus by 1929 and 1930 a large part of the investment in the milk-distributing systems of individual cities

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<sup>10/</sup> The introduction of certain types of machinery (pasteurizing, cooling) tended to increase processing costs. They constituted additional stages in processing, necessary to safeguard quality.

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TABLE 2

Hypothetical Example of Relation between Capacity  
Output, Investments, and Return on Capital

Plant	Before merger							
	Daily capacity	Daily output	Annual output	Net investment	Cost of distribution per quart	Profit per quart	Total profit	Profit on investment
	<u>gallons</u>	<u>gallons</u>	<u>1,000 quarts</u>	<u>dollars</u>	<u>cents</u>	<u>cents</u>	<u>dollars</u>	<u>per cent</u>
A	15,000	6,000	8,760	200,000	6.3	0.3	26,280	13.1
B	5,000	3,000	4,380	80,000	6.4	0.2	8,760	10.9
C	3,000	2,000	2,920	50,000	6.4	0.2	5,840	11.7
D	2,000	1,000	1,460	30,000	6.5	0.1	1,460	4.9
4	25,000	12,000	17,520	360,000	--	--	42,340	11.8
After merger*								
Plant	Daily volume	Daily output	New annual output	New not investment including goodwill	Cost of distribution per quart	Profit per quart	Total profit	Profit on investment
	<u>gallons</u>	<u>gallons</u>	<u>1,000 quarts</u>	<u>dollars</u>	<u>cents</u>	<u>cents</u>	<u>dollars</u>	<u>per cent</u>
A	15,000	11,000	16,060	{ 400,000 150,000 100,000 50,000	5.9	0.7	112,420	16.01
B	--	--	--					
C	--	--	--					
D	--	--	--					
				700,000				
In depression (volume declined 3,000 gallons daily)								
A	15,000	8,000	11,680	700,000	6.2	0.4	46,720	6.7

\* Plants A, B, C, and D. acquired by large regional firm. Plants B, C, and D closed down and all volume concentrated at A -- 1,000 gallons a day business lost in merger process.

was in the form of goodwill. It is an anomaly that while goodwill may be an important asset for an individual firm, there is no such thing as the goodwill of an industry. If a large part of the investment in an industry is in the form not of tangible operating facilities, but in the form of goodwill, that industry is carrying a top-heavy capital structure -- watered capital.

It would seem that this capitalization of the benefits of increased efficiency in market-milk systems was one of the main reasons why these systems were in such poor shape to adjust themselves to the changed conditions brought about by the depression. Distributors at first attempted to keep their margins wide enough to insure a return on capital stock equal to the returns paid prior to 1930.

New distributing firms, entering milk markets since 1929, were able to operate on a much lower investment per unit. They were able to purchase (or rent) land, buildings, and equipment at considerably lower prices than had prevailed prior to 1930. Furthermore, they started in with output adjusted more nearly to capacity. These two factors tended to a considerable extent to offset the advantages the older firms had in a larger volume. As the depression advanced, the unit costs of distribution of the older firms tended to increase with a widening gap between capacity and output, whereas in many instances the unit operating expenses of the newer firms tended to decline.

These factors applied to market-milk systems generally. In individual markets there may have been, in addition, several local factors contributing to the inefficient organization of processing and delivery.

Industry Reorganization.--- The next step appears to be to determine for an individual market what would be the ideal or most efficient system of distribution for that market.

Even if definite data were available as to the theoretically optimum size of plant, many small markets could not support one or two plants of optimum size. For example, if the optimum size were found to be 25,000 gallons daily, many markets would have a total volume of say 35,000 gallons. Two plants of optimum size would result in unused capacity of 15,000 gallons. Moreover, one plant of optimum size and another of 10,000 gallons capacity may actually result in higher average unit costs of distribution than two plants of 18,000 gallons capacity. Under the conditions of the market then the processing would be most efficiently organized with two plants of less than optimum capacity.

Processing costs must be considered in relation to delivery costs. In many markets in which population is widely scattered delivery costs may actually be higher if all milk is processed in a single plant than if two or three plants were located in different parts of the market. Somewhere along the line decreases in processing costs with increased volume may be more than offset by increases in delivery costs. The objective should be to attempt to strike a balance so that processing and delivery costs combined are the lowest possible.

Even if the most efficient system of distribution for a market could be determined, the problem yet remains of developing a satisfactory plan of transition from the present to the improved form of organization. This

transition when started should be accomplished rapidly and in such a manner to insure immediate and substantial reductions of operating costs and margins of distribution. If the reorganization is to result in relatively permanent improvement and market stability, the benefits of the reorganization as well as the benefits of future technological improvements should largely be passed on to consumers in the form of lower prices. 11/ If lower operating costs as a result of increased efficiency are not sufficient to warrant a permanent reduction of retail prices, such prices may be changed occasionally or rebates may be made to consumers periodically. Unnecessary capital facilities would have to be written off and returns on the balance kept to a moderate level, say not to exceed 6 or 8 per cent.

It is obvious that reorganization cannot be effected by the gradual competitive process leading to the elimination of inefficient plants. This process has not been successful in the past and in any case any lowering of unit operating costs is likely to be too slow and protracted to permit of any reduction in margins of distribution. Furthermore it may take so long that the next depression would catch many markets in little better shape than they are at present. Industry efficiency studies, if they are to prove of any value, should be followed by conscious planning -- the process of elimination is not planning and if this force is to be relied on, industry efficiency studies would be just so much waste effort.

If increased and more severe public control and regulation are to be avoided, it would seem that the initiative would have to come from those in the industry, distributors themselves or distributors in cooperation with producers and representatives of the general public. 12/

The most feasible procedure would appear to be for groups of plants to be amalgamated. The less efficient plants could be closed down and the volume concentrated in one or more large and well-planned units. If none of the existing plants is suitable it might be better to erect new plants rather than to expand poorly-adapted plants. Such reorganization would prove most successful if undertaken by all the distributors in a market. However, the same end may be attained if the plan is carried out by a small group of distributors. If through amalgamation they can effect a material reduction in unit distribution costs and of margins, other distributors in the market may be forced to adopt similar measures.

Participation of other interested parties and especially of the general public in inaugurating plans for more efficient systems of distribution appears to be of the utmost importance, if not essential. Many students of

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11/ Part of the benefits may be passed to employees in the form of higher wages, shorter working hours and better working conditions. In some markets somewhat higher prices could be paid <sup>to</sup> producers. There appear, however, to be fairly definite limits beyond which prices to producers cannot be increased without encouraging an increase of production.

12/ Cooperative distribution of milk by producers' or consumers' organizations does not appear feasible, at least in the near future. Distribution of milk by producers' cooperatives has not proved too successful. Where associations have operated, they existed merely as only one of several distributing agencies in a market and in very few instances have they been in a dominant or controlling position.

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the market-milk industry doubt the ability of distributors to get together except under the urge and guidance of some public authority. Many rationalization plans in European countries were consummated only with government assistance and often only after consistent governmental pressure. In any case another problem is likely to arise unless the general public is fully cognizant of developments. In the past combinations and large firms have been viewed with considerable suspicion. The public does not distinguish between quasi-monopolies based upon efficiency and monopolies. An effective system of public relations would have to be developed. If producers and some public agency assist in and are familiar with the purpose of reorganization, it should be easier to discourage new distributors from entering a market, in which distributing plants are operating efficiently. Such reorganizations may not prove ideal, but they appear to be a workable and sane approximation to ideal systems of distribution for individual markets.