

FILE COPY

STATION BULLETIN 388

MARCH 1941

The Portland Metropolitan Milk Market

D. B. DeLOACH
R. A. STEINER



Oregon State System of Higher Education
Agricultural Experiment Station
Oregon State College
Corvallis

FOREWORD

THIS report on the economics of the market milk industry in metropolitan Portland was made to the Oregon Milk Control Board by the Oregon Agricultural Experiment Station. The study that formed the basis for this report was authorized by the Board under Section 3 of the Milk Control Act (Oregon Laws, Chapter 32, Second Special Session, 1933). It covers the largest and most important milk market in the state and it should be considered in connection with Experiment Station Bulletin 375, "Some Economic Implications of Milk Control in Oregon," which reports some of the findings resulting from the economic surveys of 24 other Oregon counties.

The problems of milk marketing in metropolitan Portland are complicated and raise many significant economic questions. A discussion of many of these problems is contained in this report to the Board. A careful reading of the work done by the Station economists indicates the desirability of obtaining additional facts concerning the cost of processing and marketing. The availability of more complete data on processing and marketing costs would be an important factor in creating industry stability.

The Milk Control Board can better fulfill its functions and the industry can render more efficient service if the public has reasonable understanding of the problems of the milk industry. It is the hope of the Experiment Station that its publications relating to the producing and marketing of milk for human consumption in Oregon will help to create a better understanding of the economic problems of this important agricultural industry.

P. M. BRANDT
In Charge, Division of Animal Industries

TABLE OF CONTENTS

	Page
Foreword	2
Summary and Conclusions	4
Introduction	9
The Market	11
Population Data	11
Consumer Buying Habits	11
Milk and Cream Consumption	12
Buying Habits as Affected by Income and Size of Family	12
Minimum Price Structure for Milk and Cream	14
The Marketing Process	16
Market Channels	16
The Producer-Distributor	16
Producers' Marketing Agencies	16
The Distributor	17
Production	18
The Milkshed	18
Production Trend	18
Production Cost	23
Land Values	23
Investment in Buildings and Equipment	24
Size of Herd	24
Butterfat Yield per Cow	25
Feeding Practices	25
Farm Labor	26
Relative Cost of Producing A-Grade and B-Grade Milk Under the Portland Standard Milk Ordinance	26
Cost of Production as Calculated by Formula	27
Factors Affecting the Producer's Income from the Sale of Milk	29
Deductions from the Payout to the Producer	29
Trade Problems	30
Quotas, Pooling, and Equalization	30
Reports from the Producer-Distributors	32
Marketing Costs	32
Paper Containers	34
Cream Prices	34
Price Cutting	35
Industry Attitude	35

SUMMARY AND CONCLUSIONS RELATING TO THE MARKET

1. The population of Multnomah County, which comprises more than 98 per cent of the total of the Portland sales area, increased slightly more than 5 per cent between 1930 and 1940. It is significant, however, that the number of children between the ages of 4 and 19 years within the city limits of Portland, comprising about 86 per cent of the sales area,* decreased slightly less than 12 per cent between January 1935 and October 1939.

2. More than 50 per cent of the customers on the retail milk routes take 1 quart of milk daily. Slightly less than 23 per cent of the retail-route customers take 1 quart of milk every other day. Less than 2.5 per cent of the customers purchase 3 or more quarts of milk daily.

3. Milk dealers claim that butterfat sales in the form of cream have declined considerably over a period of several years and that their sales at present are confined primarily to restaurants. The investigators are inclined to associate this apparent decline in cream sales with the known decrease in consumer income during the depression, to changes in merchandising practices, and to changes in consumer food habits.

4. The officially reported sales of butterfat in the bottle and can trade for the period 1936 through 1939 decreased slightly more than 3 per cent. This decline in sales as reported to the Board might be caused by a combination of factors, among which we find: (1) changes in the structure of the population; (2) changes in consumer habits caused by the use of substitute products, such as canned milk; (3) the minimum price structure on milk and cream; (4) the probability that all sales in the bottle and can trade are not reported; and (5) that there is a certain amount of milk reported as surplus that is used in bottle and can channels.

5. The daily per-capita consumption of milk in the Portland area averaged .86 pint during 1939. This per-capita consumption is high in relation to other cities for which data are available.

6. The Portland retail price index on 4 per cent milk was 95 on April 1, 1940 (1923-1925 average = 100). Compulsory improvement in milk sanitation has contributed heavily to the cost of producing milk since 1930. The investigators believe that the consumers in Portland are now purchasing a superior product for a lower price than they were able to obtain prior to 1930.

RELATING TO THE MARKETING PROCESS

1. The milk consumers in the Portland sales area are supplied with milk by 18 distributors (distributors who are not producers) and 84 producer-distributors (distributors who are producers also). The distributors purchase their trade requirements of B-grade† raw milk for pasteurization from the B-grade producers directly or through the producers' marketing organizations.

2. Approximately 99 per cent of the trade requirements of B-grade milk for the distributors is obtained through producers' cooperative

* The sales area includes Multnomah County and part of Clackamas County.

† Milk sold in the bottle and can trade in Portland must have a sanitary rating of A grade or B grade. The bases for rating milk under the "Standard Milk Ordinance of the City of Portland" are (1) the bacterial count, (2) the conditions of sanitation of the premises, (3) the conditions of health and sanitation of the dairy animals, and (4) the frequency of inspection of the premises and the animals. The maximum bacterial count for A-grade raw milk is 20,000 per cubic centimeter; for B-grade raw milk the maximum

marketing associations; the remainder is purchased directly from the dairyman. There are three producers' marketing associations operating in Portland. Each of the associations acts as a pooling agent for its members; two of the group market the milk of their shippers through distributors; and one of the associations sells the major portion of its products at wholesale and retail through its own distributing plant, and the remainder to a distributor in the city. The Milk Control Board acts as the pooling agent* for the B-grade shippers who are not members of any of the three marketing organizations.

3. The producer-distributors sell A-grade raw milk and A-grade raw pasteurized milk produced on their own farms, and in addition they sell approximately 20 per cent of the milk shipped into the market by B-grade producers.

RELATING TO PRODUCTION

1. Approximately 80 per cent of the milk used to supply the Portland sales area is obtained within a 20-mile radius of the city center. The proximity of the milk market to the source of supply reduces to a minimum the cost of transportation in the area. On the other hand, the location of certain of the dairymen on sites in which the land values are too high for dairying accentuates the problem of production costs.

2. All of the A-grade raw-milk producers are located within a 20-mile radius of the city center. The location of many of the A-grade producers on land of relatively high value appears to have resulted in a high unit production cost.

3. Slightly more than 32 per cent of the B-grade milk for the Portland market originates in the State of Washington. Approximately 61 per cent of the supply from Washington is produced within a 20-mile radius of Portland. All of the Washington B-grade shippers are located within a 40-mile radius of the city.

4. The total production of milk for the market increased slightly more than 9 per cent between December 1936 and December 1939. The reported sales in the bottle and can trade decreased slightly more than 3 per cent. It appears, therefore, that an adequate supply of milk for the Portland consumers seems assured for some time.

5. There appears to have been a stable supply of A-grade and B-grade milk for the Portland market during the past 5 years. This has resulted to a large extent from control measures instituted by the Milk Control Board.

RELATING TO PRODUCTION COST

1. Approximately 75 per cent of the milk produced for the market comes from dairies having fewer than 30 cows in the herd. Only about count is 100,000 per cubic centimeter. B-grade milk must be pasteurized and the active bacterial count reduced to 20,000 per cubic centimeter before it can be sold in the city. After pasteurization, the B-grade milk is designated as A-grade pasteurized milk. Dairies producing A-grade raw milk are required to maintain the conditions of sanitation on their premises at a level above those required of B-grade raw-milk producers. A-grade raw-milk producers are required also to have their dairy herds inspected more frequently than the B-grade raw-milk producers.

Any A-grade raw milk or B-grade raw milk that is not sold in the bottle and can trade is referred to by members of the industry as surplus milk or C-grade milk. This surplus or C milk is used for manufacturing purposes. The industry refers also to milk produced for manufacturing purposes and which does not meet the sanitary requirements for A or B milk as C-grade milk. In this report that quantity of bottle and can milk that is diverted to manufacturing channels will be designated surplus or C milk.

* A pooling agent is one who functions for the milk producers in making collections for all milk sold in the city market, keeps all records relating to quota and surplus sales and equalization payments, and makes disbursements to the individual producers. In the Portland market the functions of the pooling agent are performed by the several producers' cooperative bargaining associations or by the Milk Control Board.

13 per cent of the herds have fewer than 10 cows. A material decline in the number of small herds has occurred since 1931, at which time approximately 36 per cent of the herds supplying the market ranged in size from 1 to 10 cows.

2. The difficulties experienced by small producers in maintaining a constant supply of market milk appear to have contributed measurably to the decrease in the number of small producers supplying the market.

3. The investigators believe that the shift in the production from B-grade to C-grade milk by the small dairymen is economically sound because the unit cost of producing B-grade milk is often excessive for the small-scale producer. The consumers should benefit from this concentration to the extent that it enables the producers to operate closer to optimum efficiency, thereby to reduce the unit cost of production. This will permit lowering of consumer prices provided such savings are not lost through increased costs of distribution resulting from a further duplication of distribution facilities or from a demand on the part of the consumer for special services.

4. Labor and feed costs varied widely from farm to farm, the latter because of lack of standardization in managerial practices, differences in soil fertility, and taxes.

5. The net prices paid to the producers of milk for the bottle and can trade have been and are sufficiently high to enable them to cover all normal costs if the enterprise is operated efficiently.

6. The Oregon State College formula* when applied to the price series to which it was designed—that is, the United States Department of Agriculture price series for Oregon on loose hay per ton, oats per bushel, and wages without board per month—is an adequate basis for determining the average cost of producing milk for the Portland market under present conditions. The college formula takes into consideration any reasonable type of sanitary control prevailing in a market. It does not, however, include abnormal costs of production that might result from sanitary requirements that are out of line with accepted standards; nor does it include the added costs of producing milk that result from unusual regulatory activities of state and municipal agencies.

RELATING TO FACTORS AFFECTING PRODUCER'S INCOME FROM THE SALE OF MILK

1. The net payout per pound of butterfat to members by the marketing associations differs among the associations. This is because of: (1) the relative ability of the marketing association to find a market for all of the quota butterfat of the members of their organization; (2) the relative ability of the association to obtain the best market price on the surplus butterfat shipped into the market by its members; and (3) the differences in the cost of operating the associations that appear to be related directly to the number of marketing services performed by the individual associations. There is a difference of opinion among the producers with respect to the marketing services that they require. The Board's policy regarding this problem should be: (1) to establish the minimum services that shall be required of the producer's associations; (2) to require these services to be performed uniformly; and (3) to permit the producer's associations to render any other serv-

* *Cost and Efficiency in Dairy Farming in Oregon*. Bulletin 318, Oregon Agricultural Experiment Station.

ices desired by their respective memberships. The investigators believe that a single pool for the market is a logical solution to many of the existing market problems. From a practical standpoint it is very doubtful whether a single-pool plan can be operated successfully at this time.

2. The Board maintains the pool records and prepares the individual equalization statements of the four unorganized independent B-grade shippers and the 84 producer-distributors. For this service the Board charges the shippers 1 cent per pound butterfat. No charge is made against the producer-distributors for this service. It is recommended that the producer-distributor be charged for the pooling service and that the total charge to each individual serviced by the Board in this manner be reduced to approximately $\frac{1}{2}$ cent per pound butterfat.

3. It is recommended that the Board's present policy of establishing the minimum butterfat price to producers of farm-separated cream be continued. The investigators are aware of the fact that cream shippers are charged for skim milk kept on the farm while the commercial skimming plant is not charged for the skim. The apparent injustice in the present plan is nonexistent if one considers the trade demand for a standardized butterfat cream.

RELATING TO TRADE PROBLEMS

1. Criticisms of the Milk Control Act by producers and producer-distributors have been directed mainly to certain of the policies of the Board relating to pooling. The producers insist that: (1) their quotas are not sufficiently large to permit them to operate on an economical level of output, and (2) the Board's policy of reducing the quota of the producers who fail to produce up to their basic quota is arbitrary and unduly severe to the small producer. As to the first of these contentions it is not within the province of the Board to act without changing entirely the bases for allocating quotas. The investigators feel that the second contention, however, has sufficient merit to warrant a review by the Board of the data now available. The principal grievances cited by members of the producer-distributor group were: (1) the indirect restraint of the quotas tends to restrict their market for A-grade raw milk, and (2) the requirement that the producer-distributors equalize on the basis of a 5 per cent basic surplus is unfair because they sell all of their production in the bottle and can trade. The investigators are unable to find evidence to bear out the contention of the producer-distributor that these problems are peculiar to this group in its capacity as producers.

2. The Milk Control Board does not audit the records of the producer-distributors. There is reason to believe that not all of the producer-distributors are fully reporting their sales in the bottle and can trade. It is recommended that the Board institute a practice of auditing these records, covering a substantial number of the enterprises at least once each year.

3. There is considerable duplication of facilities for processing, bottling, and delivering milk in Portland. Other factors that appear to prevent the realization of greater economy are: the sale of certain specialty products that fail to bear their full share of overhead cost; and relatively high bottle losses. The use of a store bottle and a home delivery bottle appears to offer a partial solution to the problem of bottle losses. It would be possible to use the present supply of bottles as store bottles and to have a specially designed bottle for home

delivery. A reduction in the amount of credit losses might be effected through the establishment of a clearing house for credit information. The collection of slow accounts could probably be speeded up by the practice of granting a cash discount for prompt payment. Neither of these plans would be effective, however, without the whole-hearted support of all of the members of the industry.

4. There was some interest evidenced in the substitution of paper containers for bottles. This would not be feasible from a cost standpoint unless the distributors made a complete change-over so that all equipment and facilities for handling glass bottles could be discarded.

5. The investigators are of the opinion that some of the butterfat reported as surplus by distributing firms is being used in the bottle and can trade. The books of the distributors and of the producer-distributors should be kept in such a way that their operations in the fluid milk and cream business are separated from their other operations, thereby facilitating thorough-going audits by the Board at frequent intervals.

6. Based upon the factual data made available to the investigators and a close study of marketing methods, the authors believe that the following conclusions are sound:

a. The home-delivery price on 1- and 2-quart deliveries of 4 per cent butterfat milk is in line with present costs.

b. A quantity discount on purchases of 3 or more quarts of milk delivered daily is justified on the basis of lower marketing costs.

c. A store differential on the price of milk sold over the counter is justified on the basis of lower marketing costs.

d. The price of 5 per cent butterfat milk should not exceed the price of 4 per cent milk by more than 1 cent per quart. Butterfat can be distributed more economically in the form of 5 per cent milk than in 4 per cent milk.

e. The quantity discount and store differential on 5 per cent milk should conform to the quantity discount and store differential on 4 per cent milk.

f. The price of cream is out of line with the price of milk, considering marketing costs. The Board would be justified in reducing for experimental purposes the present minimum wholesale and retail price structure on cream in $\frac{1}{2}$ -pint containers by at least 20 per cent. A larger percentage reduction should be made on containers of cream of more than $\frac{1}{2}$ pint. Experimental pricing is not new to public price-making agencies. If the demand for butterfat in the form of cream can be increased by lowering cream prices, there is reason to believe that producers and dealers will profit.

g. The legal minimum wholesale price structure has been ignored deliberately by a majority of the members of the industry. This is *prima facie* evidence that the minimum wholesale price structure is too high, or that many of the distributors have consistently operated their wholesale business at a loss. The investigators believe that the price structure is at fault.

h. A study should be undertaken by the Board to determine the costs of marketing milk and cream. Until this is done there is no satisfactory basis for arriving at an equitable price structure.

7. The successful administration of the Milk Control Act is dependent on a sympathetic understanding by, and the cooperation of, each of the groups affected by the law. This situation is not now present. There is need of definite activity by the Board to educate the various interested groups and in this manner to improve its public relations.

The Portland Metropolitan Milk Market

By

D. B. DeLOACH
Associate Economist
Oregon Agricultural Experiment Station

R. A. STEINER
Research Assistant
Oregon Agricultural Experiment Station

INTRODUCTION

Public interest in the milk trade has been directed mainly toward a control of milk sanitation. Economic regulations, restricted to that part of the industry producing milk for human consumption, date from 1933. The primary objective of all milk-sanitation laws is to protect the health of the consumers. The primary objective of most milk-control laws relating to prices and market rights is that of assuring to the producers of milk a fair return based upon the cost of producing milk under the sanitary requirements of the several states or municipalities. It is assumed that economic regulations establishing minimum prices make possible the maintenance of adequate sanitary regulations.

Economic regulation of the milk industry in Oregon has gone further than it has in any other state. It has recognized that sanitary standards can be maintained satisfactorily only if producers and dealers are receiving a return sufficient to cover costs. It adheres to the principle that producing and marketing costs can be kept down and industry efficiency increased by limiting the number of dealers (also producers in some markets), thereby making available to the consumer a high-quality milk at a reasonable price.

The Oregon Milk Control Act was passed by the Legislative Assembly in 1933 and amended in 1935 and 1939. It provided for the regulation of economic activity in the production and marketing of milk for human consumption. Economic regulation of the industry was justified in the preamble to the Act on the basis that the then existing destructive economic trade practices created conditions in the industry that "constitute a menace to the health and welfare of the inhabitants of the state." In order to "protect the well-being of the people of the state" and to insure a "constant supply of pure, wholesome milk to the inhabitants thereof" the Legislature designated the industry as "a business affecting the public health and interest which should be supervised and controlled in the manner hereinafter provided."

The Milk Control Board was created by the Act (Section 2) to administer its provisions and to set up rules and regulations within the framework of the law designed to bring a reasonable degree of economic stability to the industry. The Board was given power to establish minimum prices only to the producers, to the market middlemen, and to the consumers. It was authorized to establish market limits, to license milk dealers, to fix market quotas for producers, and to effect the necessary regulations for pooling and averaging all returns from the sales of fluid milk. The Board used its powers to establish minimum prices and to license milk dealers throughout the state, although the Board was authorized to "exempt from the license requirements provided by this act milk dealers selling milk in any quantities in markets of 15,000 population or less" (Section 4). It established market quotas and arranged for pool-

ing and averaging all returns from sales in Portland, Salem, and Eugene, only. Because of the size of each of the three markets and the nature of the problems of maintaining an adequate supply of wholesome milk in each of these markets the Board decided that the best results could be obtained by instituting a quota system.

Under the quota system the Board estimates for a given period the average amount of milk that will be used in the bottle and can trade. To this estimate is added an amount sufficient to allow for daily fluctuations in demand. The total quota so obtained is divided up among the several producers on the basis of the past ability of each producer to serve the market. Each producer is then obligated to deliver no less than his quota or to lose that portion of his quota which he fails to deliver.

The Board sought to establish a unit price for butterfat that would be uniform to the producers in the quota market by making mandatory a pooling of products and prices. The Board's pooling regulations require all producers to deliver to a pooling agent all fluid milk produced for sale in the bottle and can trade (physical delivery takes place at the plants of the several Portland distributors). The producers receive the minimum price set by the Board (less pooling charges) on that portion of the total milk quota actually used in the bottle and can trade plus whatever price can be obtained for milk used for manufacturing purposes. The payment of the individual producer is based on the percentage of the total quota used in the bottle and can trade rather than that proportion of the milk delivered by the particular producer that may have gone into the bottle and can trade. To illustrate, if during the period the sales of milk for the bottle and can trade in the quota market are equivalent to 92 per cent of the entire quota, each producer receives the bottle and can price for 92 per cent of his quota. In addition he receives the surplus price for the other 8 per cent of his quota. Likewise, he receives the surplus price for any milk delivered to market in excess of his quota.

The Dairy Cooperative Association, the Farmers Dairy Association, and the Portland Independent B Grade Producers Association have been designated by the Board as pooling agents for their members supplying the Portland market. The Board acts as pooling agent for four producers not affiliated with any pooling agent.

The pooling arrangement in the Portland market was devised for the purpose of assuring to the quota producers a uniform unit price for all milk sold in the same trade channel. The pool does not, however, assure the individual producers a market for their quotas in the bottle and can trade. On the other hand, if the estimated total market materializes, the regulations provide for the protection of the individual producers whose quota milk fails to reach the bottle and can trade because of shifts in consumer preference among distributors. These regulations stipulate that those individual producers who find an outlet for more than their quota are obligated to contribute to the other group of producers a sum sufficient to make their total receipts equal to the amount they would have received had they been able to place all of their quota milk in the bottle and can trade. This is termed equalization. If the estimated total market sales fail to materialize, the equalization payments must be made on amounts sold above the prorated share of the existing market.

The regulations introduced under the quota system in the Portland market area and the administration of these regulations have given rise to many trade problems. A study of these problems was conducted by the Oregon Agricultural Experiment Station during the summer of 1940. The following report on the results of the study was submitted to the Oregon Milk Control Board.

THE MARKET

Population data. Portland and several small suburban communities in Multnomah and Clackamas counties make up the market for fluid milk sold in the Portland sales area. Preliminary census totals for 1940 give the population of Portland at 307,600 while the entire population of Multnomah county is given as 355,436. It is believed that fewer than 5,000 people reside in the Clackamas County section of the Portland sales area. The population of Portland as given by the 1930 census was 301,815. The Multnomah County population figure for the same date was 338,241.

While it is true that a slight increase has occurred in the total population of the Portland sales area, it is significant that the number of children between the ages of 4 years and 19 years, inclusive, dropped from 71,790 in January 1935 to 63,238 in October 1939. A further breakdown of the school census figures is shown in Table 1.

Table 1. CHILDREN IN PORTLAND SALES AREA

Age of child	Census January 1935	Census October 1939
4	3,182	3,052
5	3,523	3,306
6	3,936	3,158
7	4,068	3,294
8	4,202	3,521
9	4,455	3,685
10	4,593	3,599
11	4,820	3,801
12	5,114	4,138
13	5,129	4,069
14	5,382	4,424
15	4,580	4,388
16	4,929	4,794
17	4,542	4,599
18	4,667	4,790
19	4,668	4,620
Total	71,790	63,238

Unless a movement of families to Portland from other sections of the state and nation takes place within the next five years, the percentage of the total population falling within the foregoing age groups will probably be lower than it was in 1939. This trend in population and the relative distribution of the population among certain age groups undoubtedly has a bearing on the consumption of milk, and it is possibly a contributing cause for the apparent decline in the consumption of butterfat between 1936 and 1940.

Consumer buying habits. Based on the reported sales of milk in the bottle and can trade for 1936 through 1939, the total demand for milk for any one month does not vary greatly (Table 5 and Chart 4). Daily variations appear to be of considerable importance in the market. These daily fluctuations in demand are at times quite disturbing, according to members of the industry.

An indication of the buying habits of the consumers in the market was obtained by reviewing the records of the Milk Control Board and by checking systematically the route sales of a number of distributors and producer-distributors in the area. The results follow:

	<i>Per cent</i>
Per cent of customers taking 1 quart of milk daily	50.53
Per cent of customers taking 2 quarts of milk daily	10.10
Per cent of customers taking 3 quarts of milk daily	1.66
Per cent of customers taking 4 quarts of milk daily	0.56
Per cent of customers taking 5 and more quarts of milk daily	0.18
Per cent of customers taking 1 pint of milk daily	0.54
Per cent of customers taking 1 quart of milk every other day....	22.67
Per cent of customers taking 2 quarts of milk every other day	0.06
Per cent of customers taking 3 quarts of milk every other day	0.00
Per cent of customers taking 4 quarts of milk every other day	0.56
Per cent of customers taking more than 4 quarts of milk every other day	0.34
Per cent of customers taking 1 quart of milk every other day and 2 quarts every other day	4.37
Per cent of customers taking milk at irregular intervals	8.43
Total sales on retail milk routes	100.00

Milk and cream consumption. The major part of the milk sold in Portland is marketed as 4 per cent butterfat milk. Variations from the 4 per cent butterfat standard are of two classes; namely, (1) those resulting from the inability of small producer-distributors to standardize satisfactorily, and (2) the sale of 5 per cent butterfat milk to a special trade that is willing to pay the extra charge for the additional butterfat contained in the 5 per cent product.

The principal market for butterfat in the form of fresh cream is through restaurants, according to all of the milk dealers. Store sales of cream are next in importance, a condition that can be attributed to the semiluxury character of the product and to the irregularity of consumer purchases. A check of the records of a representative group of retail milk routes in the city revealed that the average daily sales of cream to slightly more than eleven thousand retail customers for the month of May 1940 totaled approximately 14 gallons of cream in all sizes of containers. Causes contributing to the decline in cream sales according to the dealers are:

1. A change in consumer habits attributable in part to lower purchasing power during the depression period, and to the fact that many consumers became accustomed to the use of evaporated or condensed milk as a cream substitute.
2. Changes in consumer food habits.
3. The high price of cream in comparison to the price of milk.

It appears that there has been an annual increase in the sales of canned milk in the Portland market for a number of years. A conservative estimate based on a check on the sales of representative Portland wholesale grocers would place this growth at 20 per cent since 1934. Taking into consideration the population trend, the reported consumption of fresh milk, and the possibility of under-reporting in the latter, it may be safe to generalize that there has been a shift away from fresh milk to canned milk in the Portland market.

Buying habits as affected by income and size of family. The per capita consumption of milk in Portland averaged .86 pint of 4 per cent butterfat milk daily during 1939. This per-capita consumption appears high in relation to the consumption in other markets for which statistical data are available. Three factors are believed to have contributed to the high per-capita consumption of milk in this area. These are: (1) a higher-than-average family

Table 2. ANNUAL PER-CAPITA CONSUMPTION IN THE UNITED STATES OF SELECTED DAIRY PRODUCTS, 1924-1937

Year	Milk used in cities and villages	Evaporated milk	Butter†	Cheese‡	Ice cream§	All dairy products milk equivalent
	Gallons	Pounds	Pounds	Pounds	Gallons	Gallons
1924	38.6	9.6	18.1	4.6	1.7	91.7
1925	38.9	9.3	17.7	4.7	2.0	92.2
1926	39.3	9.7	17.5	4.7	2.0	94.6
1927	39.7	9.5	17.5	4.5	2.0	94.4
1928	39.8	10.3	17.2	4.5	2.0	94.2
1929	40.8	11.2	17.4	4.6	2.1	94.5
1930	40.1	11.3	17.3	4.6	2.0	95.1
1931	39.0	11.5	18.1	4.5	1.7	97.6
1932	39.1	10.4	18.3	4.4	1.2	96.9
1933	38.6	12.4	17.9	4.5	1.2	94.8
1934	36.1	13.5	18.3	4.8	1.4	94.8
1935	37.0	14.6	17.3	5.2	1.6	93.5
1936	38.2	14.1	16.6	5.4	1.9	93.0
1937	*	14.8	16.7	5.5	2.2	94.0

* Not available.

† Includes both farm and factory-made butter. These estimates include some butter used in other products such as ice cream.

‡ Includes all kinds of cheese except cottage, pot, and bakers.

§ Production of ice cream in 1937 not strictly comparable with preceding years, because of the inclusion of production of small retailers and counter freezers not previously included.

Source: *Agricultural Statistics, 1939.*

income of the people of Portland (Table 3), (2) the price of butterfat sold to the consumers in the form of fluid milk, and (3) the confidence of the public in the safety of its milk supply.

Family income and the number of children in a family have a direct bearing on the per-capita consumption of milk. In their study of the Vancouver, British Columbia, market, Johnston and Hopper state that:

"The daily per capita consumption of milk was found to be 0.65 pint in the 1082 households visited. The range in per capita consumption was approximately 0.20 pint between the lowest and highest per capita income groups.

"The number of children in the household appeared to influence per capita consumption even in the same per capita income group. Households containing two children had the largest per capita consumption in all per capita income groups, while households containing four or more children used less per capita than households having only adults in the large group where the per capita income was less than \$300."*

The data given in Table 3 indicate that a substantial percentage of the families in Portland receives sufficient income to permit the purchase of fresh milk. This does not imply that the income level of these families is adequate to buy all of the milk needed for a proper diet.

The Portland retail price per quart of 4 per cent butterfat milk is lower per unit than the average price on milk of similar butterfat content in the cities in 40 states for which data were available.† This is particularly significant in view of the fact that the Portland retail price index on milk, based on the

* *An Economic Study of the Consumption of Milk and Cream in Vancouver (British Columbia)* by Charlotte I. Johnston and W. C. Hopper. Publication 678, Technical Bulletin 25, Dominion of Canada, Department of Agriculture, February 1940.

† *Fluid Milk Market Report*, May 13, 1940. United States Department of Agriculture, Agricultural Marketing Service, Washington, D. C.

Table 3. PERCENTAGE DISTRIBUTION OF FAMILIES BY INCOME CLASS IN SELECTED CITIES
1935-1936

All Families, Relief and Nonrelief

Income Class	Portland,* Oregon	Atlanta,† Georgia	Columbus,‡ Ohio	Providence,§ R. I.
	Per cent	Per cent	Per cent	Per cent
Under \$500	15.4	25.3	13.5	14.3
\$500-\$999	21.7	23.7	22.6	28.9
\$1,000-\$1,499	21.3	15.1	21.1	24.0
\$1,500-\$1,999	17.6	11.7	17.2	14.8
\$2,000-\$2,999	16.6	14.2	15.9	11.5
\$3,000-\$4,999	5.9	7.9	7.4	4.8
\$5,000 and over	1.5	2.1	2.3	1.7

Sources: The following United States Department of Labor bulletins:

* Family Income in Four Urban Communities in the Pacific Northwest Region, 1935-1936. Bulletin No. 649.

† Family Income in the Southeastern Region, 1935-1936. Bulletin 647.

‡ Family Income in Nine Cities of the East Central Region, 1935-1936. Bulletin 644.

§ Family Income in Five New England Cities, 1935-1936. Bulletin 645.

1923-1925 average prices, is 15 per cent above the Portland average price index on all foods and 17 per cent above the United States average price index on all foods as of April 1, 1940 (Chart 1). In spite of the fact that the average unit retail price on milk is below the average unit retail price for the base period (1923-1925) there has been a definite improvement in the sanitary quality of the product. This has increased unit production costs considerably. The extent of quality improvement is indicated by a comparison of present sanitary standards (see footnote page 4) with former conditions as they are described in a report on the Portland milk market prepared by the Oregon Agricultural Experiment Station in 1926.

"In September 1925 bacterial counts were made of the raw milk delivered to the principal plants. The average count was 2,600,000 per cc. This indicates something about the average quality of the milk that the plants must pasteurize."*

The imposition of stringent health and sanitation regulations on the producers and handlers of milk has taken place in Portland since 1930, at which time the "Standard Milk Ordinance" was adopted.

Minimum price structure for milk and cream. The following legal minimum price schedule to the wholesale and retail trade was made effective by Board Order No. 116 as of April 16, 1938:

MILK

Size container	4 per cent butterfat		5 per cent butterfat	
	Wholesale	Retail	Wholesale	Retail
			Cents	Cents
One-half pint	3*	5	3½	...
One pint	6	8	7	9
One quart	9	11	11	13
Gallon lots in cans	36	44	44	52

* Except in school cafeterias, which may be 2½¢.
Milk in 10-ounce bottles, 3¢ higher than 8-ounce bottles.

* *A Study of the Production of Fluid Milk in Portland*, mimeographed report by N. C. Jamison, P. M. Brandt, and D. L. James.

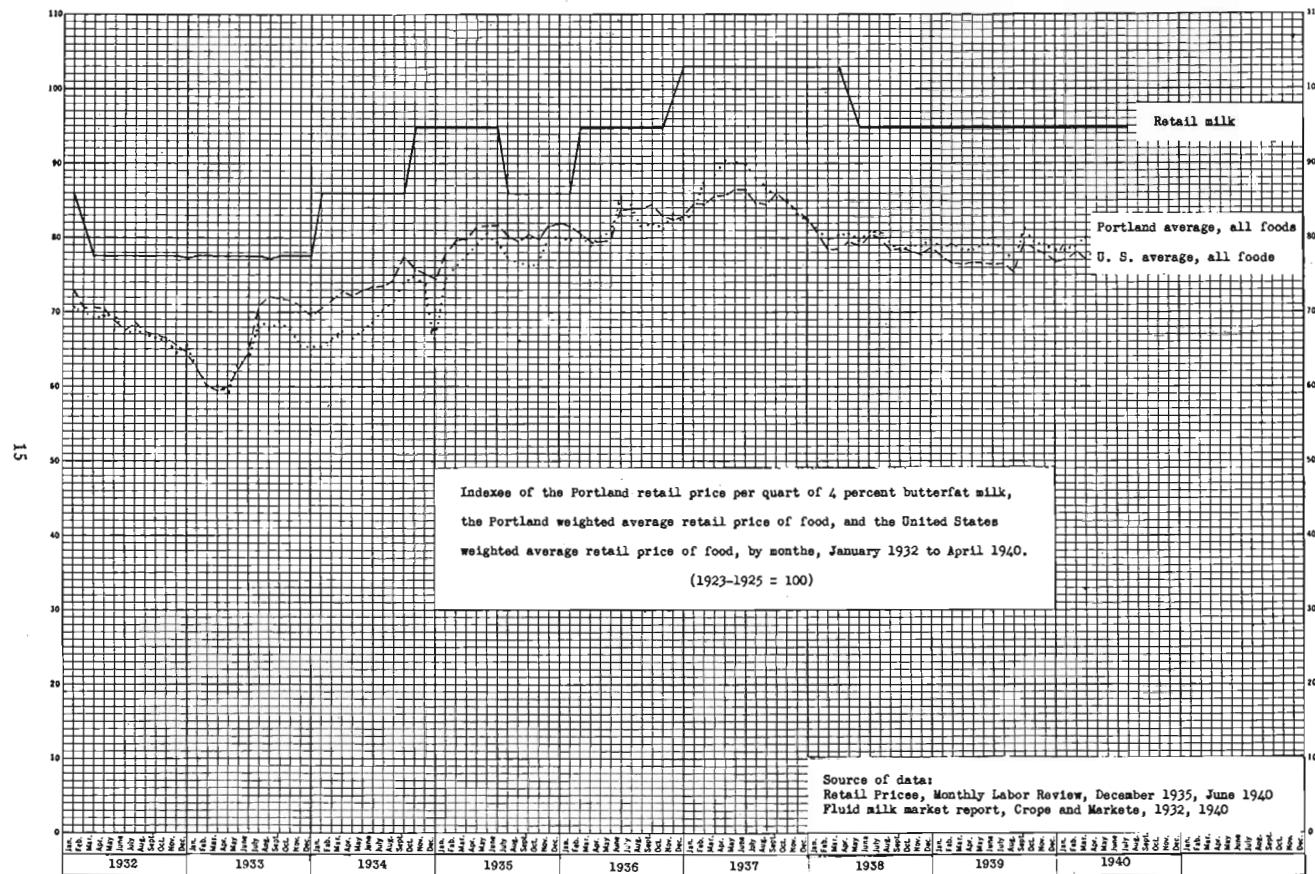


Chart 1.

CREAM

Size container	Light cream 20-22 per cent butterfat		Heavy cream 30-33 per cent butterfat	
	Wholesale	Retail	Wholesale	Retail
	Cents	Cents	Cents	Cents
One-half pint	13	15	16	18
One pint	22	25	30	33
One quart	40	45	55	60
Gallons	160	180	220	240

SKIM MILK AND BUTTERMILK

Size container	Wholesale		Retail	
	Cents	Cents	Cents	Cents
One quart	5		6	
Gallon	20		24	
Lots of 10 gallons or more	15		....

Bulgarian buttermilk with butterfat the same price as 5 per cent milk.
 Chocolate milk the same price as 4 per cent milk.

In theory, the minimum price structure established by the Board is based on the cost of producing and marketing milk and cream. The following pages are devoted, therefore, to a discussion of the components of these prices.

THE MARKETING PROCESS

Market channels. The market channels through which the Portland consumers receive milk and cream from the producer are the same as those found in most other sections of the United States. The following outline indicates the nature of the marketing process:

1. Producer to retail store and/or consumer. In this instance the producer delivers milk produced on his own farm directly to the consumer. The retail price is charged for the product. Only A-grade producers are involved in this type of marketing.
2. Producer to distributor (processor) to retail store (either independent or chain) and/or consumer.
3. Producer to producer-owned processing plant to retail store and/or consumer.

The producer-distributor. The producer who engages in marketing his milk directly to the wholesale and retail customers is known as a producer-distributor. There are 84 producer-distributors operating in the Portland market. The producer-distributor is engaged in two activities; namely, producing and marketing. It is believed that at least 20 per cent of the produced-distributor's trade is wholesale* and 80 per cent is retail. The marketing services of the group consist primarily in bottling, delivery, credit, and collection. Several of the group are now pasteurizing a part of their A-grade raw milk which adds to the cost of the marketing services ordinarily performed. A total of 124 delivery trucks and 17 relief trucks are operated by the producer-distributors.

Producers' marketing agencies. A majority of the milk producers in the milkshed have membership in the following marketing associations: the

* The wholesale trade in milk and cream includes not only milk sold through retail-store outlets but also the amount of these products sold through restaurants.

Dairy Cooperative Association, the Portland Independent B Grade Producers Association, the Farmers Dairy Association, and the Portland Milk Producers' Association. Four B-grade producers shipping milk to the market operate independently, but their pooling operations are taken care of by the Milk Control Board. There is a sufficient difference in the functions performed by the four associations that each will be discussed below.

The Dairy Cooperative Association, organized in 1929 under the Cooperative Association Laws of Oregon, has a membership of approximately 512 B-grade shippers, 409 C-grade shippers, and a maximum of 1,908 churning-cream shippers. This association is essentially a bargaining agent for its B-grade membership. It functions for the producers as a pooling agent. This involves keeping the pool records and effecting equalization of payout among the producers. The other marketing services are those of the collection of milk from the farms of the members, the delivery of this milk to the several distributing plants that are customers of the cooperative, and the diversion of some of the bottle and can milk into the association's skimming plant to obtain cream for sale to distributors. Surplus butterfat is used in factory channels for the manufacture of ice cream or butter. The skim milk is used by the association for the manufacture of powder or it is sold to distributors. Services of an educational character are carried on by the association. These services are of two types; namely, (1) those directed to the public that work to the advantage of the industry, and (2) those directed to the membership.

The Portland Independent B Grade Producers Association, organized in 1936 under the Oregon Cooperative Laws, has a membership of approximately 112 shippers. The association functions as a bargaining agent and calculates the pool payouts for its members. The members of the association obtain fewer services from their organization than do the members of the Dairy Cooperative Association.

The Farmers Dairy Association, organized in 1934 under the Oregon Cooperative Laws, has a membership of approximately 43 B-grade shippers all of whom are located in the State of Washington. This organization operates its own distributing plant, and in addition it supplies one of the Portland milk distributors with the principal part of its milk requirements.

The Portland Milk Producers' Association, organized in 1934 under the Oregon Cooperative Laws, is another producer marketing organization. The Association membership is composed of approximately 48 producer-distributors who deliver to the Association's plant for pasteurization of the A-grade raw milk in excess of their own trade requirements. This pasteurized A-grade raw milk is marketed by the producer-distributors and by hucksters.

The distributor. The distributor is a market middleman who engages in the processing, bottling, and delivery of milk at wholesale and/or retail. The 18 distributors operating in the market purchase B-grade raw milk through the producers' marketing agents or directly from the producer. The marketing services performed by the distributors are the same as those listed for the producer-distributors, except for the fact that the pasteurization of B-grade raw milk is required under the city milk ordinance. The distributors supply approximately 75 per cent of the market demand, of which 58 per cent is wholesale and 42 per cent retail. Approximately 20 per cent of the B-grade milk pasteurized by the distributors is sold to producer-distributors. To the extent that the producer-distributor buys milk for resale, he is functioning in the market as a distributor.

Each of the distributors maintains the plant facilities essential to the work of assembling, processing, bottling, and delivery as well as the administrative

and office personnel necessary to this type of operation. A total of 152 delivery trucks are operated by the various firms, of which 21 are maintained for relief duty.

PRODUCTION

The milkshed. The daily supply of milk for the Portland market is produced by 678 B-grade shippers located in Oregon and Washington and 84 A-grade producer-distributors located in Oregon. Oregon B-grade shippers supply approximately 70 per cent of the daily market requirements of B-grade milk, the remaining 30 per cent is shipped into the market by 190 B-grade producers located in Washington. Approximately 79 per cent of all grades of milk for the market originates within a radius of 20 miles of the city center. About 18.5 per cent is produced within the 20-40 mile radius, while the remainder is produced within the 40-70 mile radius (Table 4 and Charts 2 and 3). From the information available, it appears that the licensed producers located beyond the 40-mile zone are sweet-cream shippers; therefore, all of the whole milk for the bottle and can trade is produced within the 40-mile radius.

A further breakdown of the available data on production shows that B-grade shippers are most numerous in Washington County, Oregon, and in Clark County, Washington, each of which is within 20 miles of the city. All of the producer-distributors are located within the 20-mile zone, and a substantial number of this group is found within the city limits.

The Oregon shippers of B-grade milk for the Portland market are concentrated in the area between Portland and Forest Grove, some 25 miles to the west of Portland. The land on which these dairies are located is well adapted to the production of hay and grain, an essential to satisfactory dairy operations. Perhaps the principal drawback to economical production of milk in this section of the milkshed is the shortage of rainfall during the summer months. Irrigation has been undertaken by some of the dairymen, although it is not likely to be extended much further under present conditions because of the inadequate water-storage capacity.

The statements made with respect to land adaptability and insufficiency of rainfall in Washington County, Oregon, apply as well to the sections of the Willamette Valley between Portland and Salem, and to the Battle Ground, Brush Prairie, and Orchard districts of Clark County, Washington. Especially low-cost-feed producing areas are found in certain sections of Oregon and Washington. This applies to the Sauvie's Island district in Multnomah County, Oregon, and to the Ridgefield-Woodland district in Washington. It is within such areas that the effect of adequate and low-cost pasture is reflected in the unit cost of producing butterfat.

A substantial number of the producer-distributors are located in the bottom land along the Columbia River in Multnomah County. The land on which most of these dairies is located is well adapted for use in the production and marketing of truck crops.

Production trend. The annual production of butterfat available for the Portland bottle and can trade increased from 5,009,243 pounds in 1936 to 5,477,396 pounds in 1939. This production increase of 9.3 per cent occurred at a time when the sales reported in the bottle and can trade decreased from 4,220,858 pounds in 1936 to 4,069,137 pounds in 1939, or 3.6 per cent (see Table 5).



Chart 2. Location of B-grade shippers supplying the Portland market.

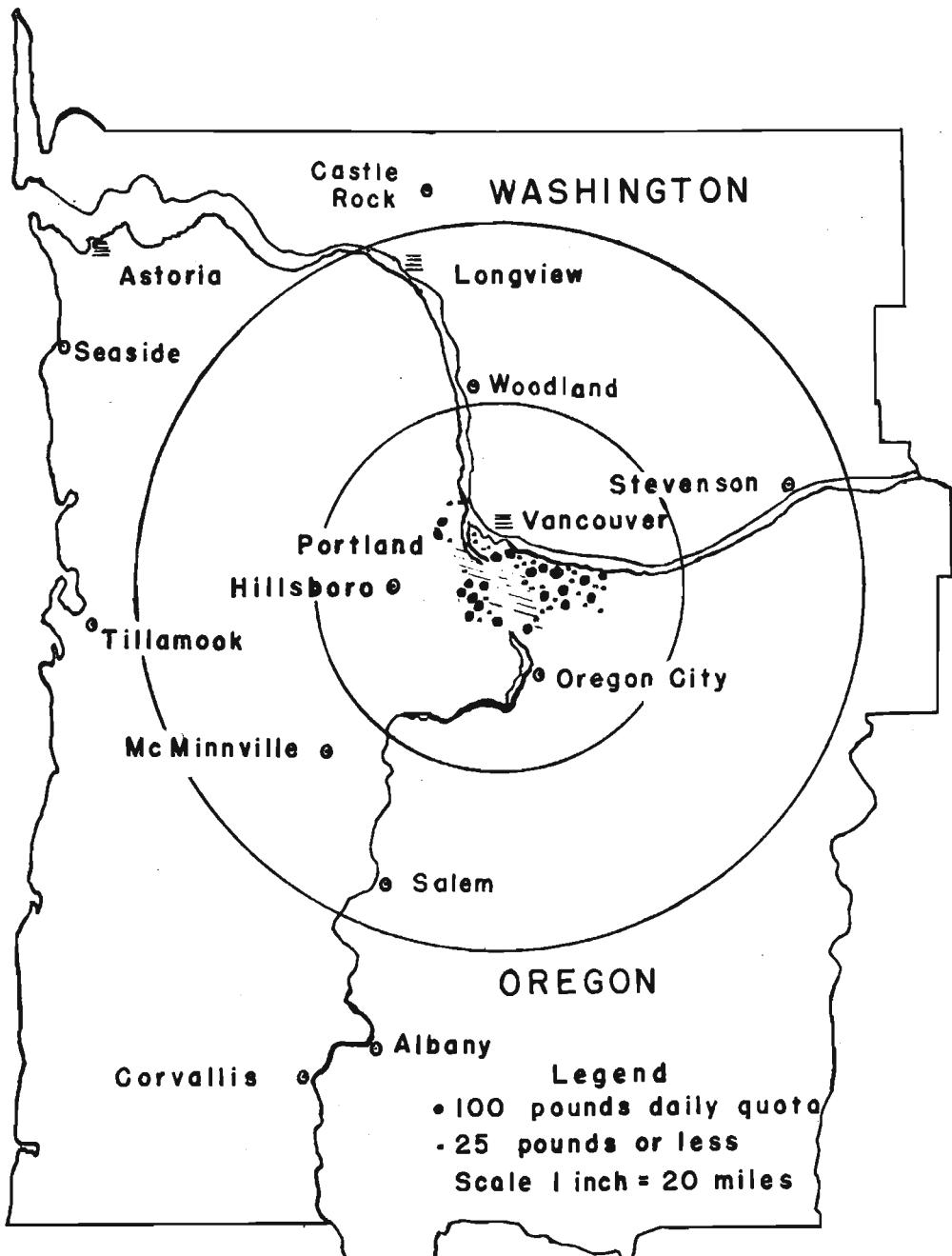


Chart 3. Location of producer-distributors supplying the Portland market.

Table 4. DAILY SUPPLY OF BUTTERFAT TO THE PORTLAND MARKET
By Zone, Grade, and State of Origin

Zone*	B Grade						A Grade		Total	
	Oregon		Washington		Total		Oregon			
	Pounds	Per cent	Pounds	Per cent	Pounds	Per cent	Pounds	Per cent	Pounds	Per cent
1	5,468.34	54.90	1,805.10	18.14	7,273.44	73.03	3,024.20	100.00	10,297.64	79.31
2	1,287.91	12.93	1,112.38	11.17	2,400.29	24.10	.....	.....	2,400.29	18.49
3	189.79	1.91	.....	.....	189.79	1.91	.....	.....	189.79	1.46
4	29.26	.29	44.00	.44	73.26	.73	.....	.....	73.26	.57
Not listed above .....	.....	.....	.....	.....	22.45	.23	.....	.....	22.45	.17
Total ..	6,975.30	70.03	2,961.48	29.75	9,959.23	100.00	3,024.20	100.00	12,983.43	100.00

* Zone 1—0-20 miles
Zone 2—20-40 miles
Zone 3—40-60 miles
Zone 4—60+ miles

RECAPITULATION			
	Butterfat	Pounds	Per cent
A Grade	3,024.20	23.29
B Grade	9,959.23	76.71
Total	12,983.43	100.00

Table 5. PRODUCTION AND SALES OF A-GRADE AND B-GRADE MILK FOR THE PORTLAND MARKET*
By Months, 1936 to 1939, inclusive

Month	1936				1937			
	Purchases <i>Pounds Butterfat</i>	Sales <i>Pounds Butterfat</i>	Delivered quota <i>Pounds Butterfat</i>	Surplus <i>Per cent</i>	Purchases <i>Pounds Butterfat</i>	Sales <i>Pounds Butterfat</i>	Delivered quota <i>Pounds Butterfat</i>	Surplus <i>Per cent</i>
January	353,309†	293,611†	304,218	12.37	420,883	350,813	374,942	16.65
February	320,348†	260,950†	277,374	18.54	387,795	312,778	341,477	19.35
March	346,710†	270,699†	299,722	21.92	433,248	354,068	378,930	18.28
April	485,507	373,197	378,894	23.13	437,910	345,261	369,458	21.16
May	517,090	381,192	389,880	26.28	492,398	353,016	388,385	28.31
June	462,505	376,239	372,323	18.65	473,269	352,618	378,064	25.49
July	464,117	378,934	388,503	18.35	466,759	356,342	391,693	23.66
August	432,399	380,800	379,112	11.93	448,901	352,383	390,082	21.50
September	402,827	380,635	358,933	5.51	433,850	351,740	370,653	18.93
October	408,568	402,318	365,254	1.53	448,195	366,823	383,923	16.74
November	398,739	366,692	361,036	8.04	423,757	352,222	377,472	16.88
December	417,124	355,591	375,272	14.75	445,164	355,376	393,302	20.17
Total	5,009,243	4,220,858	4,253,621	15.74	5,312,129	4,203,440	4,538,381	20.87
Daily average	13,724	11,564	.....	.....	14,554	11,516	.....	.....

22

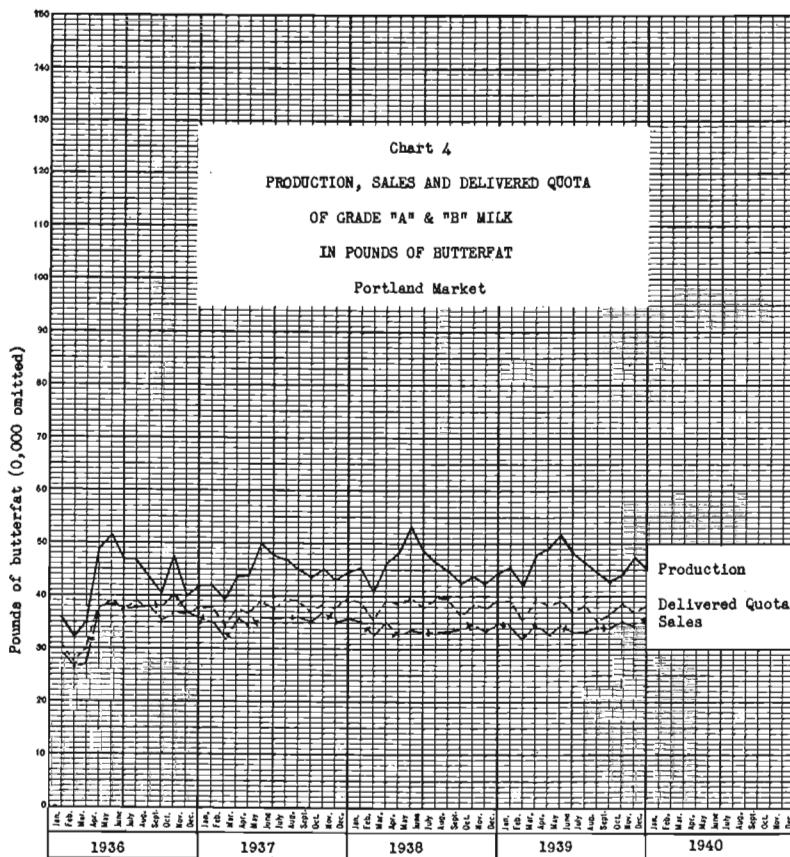
Month	1938				1939			
	Purchases <i>Pounds Butterfat</i>	Sales <i>Pounds Butterfat</i>	Delivered quota <i>Pounds Butterfat</i>	Surplus <i>Per cent</i>	Purchases <i>Pounds Butterfat</i>	Sales <i>Pounds Butterfat</i>	Delivered quota <i>Pounds Butterfat</i>	Surplus <i>Per cent</i>
January	451,224	351,142	389,594	22.18	452,047	342,796	390,081	24.17
February	407,748	317,271	353,461	22.19	417,582	314,318	355,565	24.73
March	462,319	350,148	395,414	24.26	472,861	346,198	395,047	26.79
April	481,817	328,610	384,474	31.80	492,482	324,259	383,718	34.16
May	527,962	338,485	395,939	35.89	516,273	344,534	390,935	33.27
June	482,642	333,336	382,241	30.94	474,404	331,706	371,943	30.08
July	463,106	333,013	395,812	28.09	466,738	333,120	380,754	28.63
August	446,333	334,682	393,550	25.02	443,013	341,548	355,893	22.90
September	422,509	338,569	363,721	19.87	429,766	341,070	369,215	20.64
October	437,539	348,225	383,587	14.07	440,773	352,202	385,500	20.10
November	422,595	338,484	379,643	19.90	472,418	343,671	371,413	19.59
December	444,038	342,828	391,825	22.79	444,037	353,713	382,511	20.34
Total	5,449,832	4,054,793	4,609,261	25.60	5,477,396	4,069,137	4,532,575	25.71
Daily average	14,931	11,109	.....	.....	15,006	11,148	.....	.....

* Annual Report. Oregon Milk Control Board. Year ending December 31, 1939.

† Data for B-Grade shippers only.

The increased deliveries of milk to the Portland market appear to be the result of two factors; namely, (1) the tightening of quota requirements which forced producers to make deliveries up to their quotas if they chose to keep their quotas, and (2) a decline in the price of factory milk from the 1936-1937 level.

The daily deliveries of milk normally have been more than adequate to supply the trade demand in the area. There have been a few days, however, when the available supply of milk delivered by the licensed producers barely met an unusually high demand occasioned by an influx of out-of-town visitors. The narrow margin by which a market shortage of milk was averted is not brought out in Table 5 and Chart 4 which are based on monthly averages.



PRODUCTION COST

Land values. Production-cost estimates varied between 30 cents and 68 cents a pound butterfat. The investigators found no producers whose costs were

given below or above the range indicated. There is little doubt, however, that under some conditions the cost of butterfat will fall below 30 cents and in other cases it will exceed 68 cents.

Land values are an important variable in the cost of producing milk. All of the producers of A-grade raw milk are located within the 20-mile radius of the city center. This location is made necessary as a result of the problems of wholesale and retail delivery encountered by the producer-distributors in marketing their products. A concentration of producer-distributors has taken place in southwest Portland and along the Columbia River. Others are located in sections of the city where it is convenient for them to serve a substantial portion of their trade. Many of them established their present businesses when the value of land in the particular locality was not out of line with the value of other land used for general farming purposes. The growth of the city and the development of good roads made possible the conversion of adjoining or neighboring acreages into residential sections. Although the dairymen have been able to retain their farms, their property has increased in value materially and taxes have increased proportionately. Today the producers operating on land of a semiresidential classification are faced with the problem of making ends meet in a milk market that has tended to level off if not decrease in recent years. Very few if any of the producers are in a position to develop their production facilities to the point of maximum effectiveness, because the market will not absorb their output. It appears, therefore, that a substantial percentage of the producer-distributors can remain in the market only as long as the price structure is maintained at a level sufficiently high to cover their costs under existing conditions of operation.

The producers of 73.03 per cent of the B-grade milk (in pounds of butterfat) carry on their production within a 20-mile radius of the center of the city. It is important to notice, however, that the production areas for B-grade milk are concentrated in southwest Washington County, Oregon, and in the western part of Clark County, Washington, immediately outside the high-rent district of metropolitan Portland.

Investment in buildings and equipment. The average investment per cow in dairy buildings and equipment varies greatly among the producers in the milkshed. A substantial number of the producers maintained a minimum investment in plant and facilities, which enabled them to meet the requirements of the sanitary code for the area. Others were operating dairy establishments with a high investment, based on an average investment per cow. Efforts on the part of the dairymen to maintain their buildings and equipment in a suitable state of repair differed considerably among the members of the industry. Observations made in the course of the survey revealed clearly that some of the dairymen were doing little toward maintaining their property beyond the point necessary to meet the minimum sanitary requirements prevailing in the market. Very few of the dairymen had any definite notion of their investment in dairy buildings and equipment unless such equipment had been purchased in recent years.

Size of herd. A substantial percentage of the B-grade producers who milk less than 10 cows conduct such operations on a part-time basis. This appears to be due to one of two conditions: (1) dairying is a side-line farming enterprise that produces a cash income, or (2) the quota restrictions discourage dairymen from expanding their market-milk enterprises, thereby making it economically advisable for them to enter other types of farming operations in

order fully to utilize their resources. Ordinarily there is a direct relationship between the size of the dairy herd and producing costs.

The statistics with respect to the size of herds in the Portland milkshed were compiled by members of the staff of the Milk Control Board at the request of the Oregon Agricultural Experiment Station. These are set forth in Table 6.

It is significant that 79.65 per cent of the B-grade producers operate dairy farms with herds of fewer than 30 cows, while 40.47 per cent of the A-grade producers fall within the same size range.* Twelve dairies of 100 cows or more are operated by A-grade and B-grade producers.

The statistical data on herd sizes together with the observations made by the investigators in the course of the survey led to the conclusion that the milk supply for the market is produced by family-sized units or by units that can be operated with a minimum of hired labor.

Table 6. SIZE OF HERDS SUPPLYING THE PORTLAND MARKET AREA

Number of cows in herd	B grade		A grade		A and B grades	
	Number of herds	Per cent of B herds	Number of herds	Per cent of A herds	Number of herds	Per cent of total herds
0- 9	88	12.98	10	11.90	98	12.86
10-19	311	45.87	15	17.84	326	42.79
20-29	141	20.80	9	10.73	150	19.68
30-39	60	8.85	10	11.90	70	9.19
40-49	36	5.31	7	8.33	43	5.64
50-59	16	2.35	6	7.15	22	2.89
60-69	13	1.92	6	7.15	19	2.49
70-99	8	1.18	14	16.67	22	2.89
100-....	5	.74	7	8.33	12	1.57
Total ..	678	100.00	84	100.00	762	100.00

Butterfat yield per cow. The producers who obtain a high butterfat yield per cow are in most instances among the low-cost producers in terms of the unit cost per pound of butterfat. The butterfat yield per cow can be related directly to the quality of cattle on the farm, and the feeding practices of the individual dairymen. Mixed-breed herds predominate in the Portland milkshed although graded Jersey and Guernsey herds are common to the area. Purebred Jersey and Guernsey herds are found on several farms. Other breeds that characteristically are low in butterfat production in terms of a percentage of total milk yield are of minor importance numerically, although there is some tendency among the producer-distributors to introduce Holstein cows in Jersey and Guernsey herds to make the average butterfat content of the milk conform to the legal standards for milk at a given minimum price.

Feeding practices. In a few instances the investigators found producers who were keeping cost records in connection with the activities of their County Dairy Herd Improvement Association. These records indicate quite clearly that the cost of feed is closely related to the butterfat production of the herd. One producer, whose herd averaged 413 pounds of butterfat per cow in 1937, reported a feed cost for that year of 19.5 cents per pound of butterfat. The

* A progress report of the Dairy Cooperative Association dated April 4, 1931, gave the percentage distribution of herds of a given size range engaged in supplying B-grade milk for the Portland, Salem, and Vancouver markets as follows: herds under 10 cows represent 35.7 per cent of shippers and 15.8 per cent of milk volume; herds of 10 to 20 cows represent 43.1 per cent of shippers and 38.5 per cent of milk volume; herds of 20 to 40 cows represent 16.4 per cent of shippers and 26.9 per cent of milk volume; herds of 40 cows or over represent 4.8 per cent of shippers and 18.8 per cent of milk volume.

same producer's herd averaged 488 pounds of butterfat per cow in 1938, and his records indicate a feed cost for the year of 16.4 cents. Another dairyman in the same district reported a feed cost of 19.4 cents for 1939. The average butterfat production per cow in his herd was 404.7 pounds. Part of this charge can be attributed to feed costs that showed some degree of variation in the two seasons.

Concentrate feeds are used sparingly by many dairymen. Dependence for cattle feed rests essentially on pasture, hay raised on the farm, and silage. Innovations in farming practices, such as the introduction of irrigating systems, have a material bearing upon the feeding practices of many of the dairymen.

Monthly variations in the cost of feed per pound of butterfat are brought out clearly in the records of producers, one of which is reproduced in Table 7.

Farm labor. The wages paid for labor hired on the farms by the producers of milk for the Portland market appeared to vary from \$25 to \$60 per month with room and board. A few producers were paying more than \$60. A small number of dairies pay more than \$60 a month for expert milkers. In most instances the farm labor hired by dairymen was utilized in various types of farming operations in addition to functioning as herdsmen or milkers.

Table 7. FEED COST PER POUND OF BUTTERFAT

Year and month	Feed cost	Year and month	Feed cost
	Cents		Cents
1938		1939	
November	23.25	November	20.80
December	22.00	December	20.00
1939		1940	
January	22.50	January	22.00
February	22.40	February	17.70
March	22.30	March	18.00
April	16.00	April*	
May	17.75	May	13.50
June	17.00	.....	.....
July	16.00	.....	.....
August	16.75	.....	.....
September	20.00	.....	.....
October	22.80	.....	.....

* Not available.

Relative cost of producing A-grade and B-grade milk under Portland Standard Milk Ordinance. The principal difference in the cost of producing A-grade raw milk and that of producing B-grade raw milk in this milkshed is due to the fact that the A-grade producers must provide mechanical or other forms of artificial refrigeration to cool the milk to a temperature of 50° Fahrenheit. The cooling temperature for B-grade raw milk is required to be 70° Fahrenheit or less, a provision that can be met without the installation of expensive equipment.

The type of construction of the dairy-barn floor and the manner of keeping the cowyard are less severe in case of the regulations governing the B-grade producers than the A-grade producers. It has been estimated, however, that approximately two-thirds of the B-grade producers in the market have met the requirements imposed upon the A-grade, and that many of the B-grade producers have constructed types of buildings that go far beyond the minimum requirements set up under the Standard Milk Ordinance.

Cost of production as calculated by formula. Some of the variables having a distinct bearing on the cost of producing milk for the Portland market have been discussed in the preceding paragraphs. It is impossible in a limited survey of this type to arrive at an accurate figure of the average unit cost of production. A study of the Oregon State College formula was

Table 8. PRICE SERIES

Source: *Crops and Markets*

Date	Farm price per ton of loose hay	Farm price per bushel of oats	Monthly farm wage without board	Estimated cost per hundred-weight of 4 per cent butterfat
1931				
January	\$ 9.80	.35	\$57.00	\$2.07
April	8.10	.33	57.00	1.95
July	8.40	.31	56.00	1.94
October	8.40	.27	49.25	1.84
1932				
January	9.40	.35	46.75	1.95
April	10.70	.36	45.25	2.02
July	6.20	.34	41.50	1.70
October	6.70	.28	40.00	1.66
1933				
January	6.50	.28	34.50	1.59
April	8.00	.35	32.50	1.73
July	8.40	.39	36.25	1.82
October	9.00	.33	40.00	1.84
1934				
January	8.90	.33	35.75	1.79
April	7.20	.30	39.50	1.70
July	6.70	.34	44.00	1.75
October	8.20	.43	44.00	1.92
1935				
January	8.60	.45	39.00	1.92
April	8.50	.45	41.25	1.93
July	7.90	.37	47.00	1.88
October	8.20	.34	47.00	1.87
1936				
January	8.70	.35	41.50	1.86
April	9.50	.35	44.75	1.94
July	8.00	.36	53.25	1.94
October	9.00	.43	53.25	2.06
1937				
January	9.30	.45	46.25	2.03
April	9.70	.50	52.00	2.16
July	8.70	.50	56.75	2.14
October	9.00	.36	58.00	2.04
1938				
January	9.50	.38	50.00	2.01
April	9.20	.38	53.25	2.03
July	7.80	.36	53.25	1.92
October	8.30	.36	53.25	1.95
1939				
January	8.60	.41	48.75	1.93
April	8.00	.41	51.00	1.96
July	8.00	.39	54.50	1.98
October	8.50	.37	54.75	1.99
1940				
January	8.50	.38	51.00	1.96
April	7.70	.36	53.00	1.92
July (preliminary)	6.80	.31	55.75	1.84

undertaken, therefore, to furnish the industry and the Board a suitable basis for determining the average cost of producing milk in the area.

A question of paramount importance in reviewing the formula to determine its applicability to the problem at hand is whether the formula when applied to the price series* furnishes a reasonable estimate as to the average cost of producing milk in the Portland milkshed. The investigators are of the opinion that the College cost-of-production formula is adequate to meet the needs of the industry with the exception of the points indicated in the following analysis.

The results obtained by applying the formula to the price series by quarters for the period January 1931 to July 1940 are shown in Table 8.

Comparative net pool payout data are available for one of the producer marketing agencies for the months ending May and November of 1936 through 1939. These payout figures and the cost-of-production figures as calculated by formula are summarized below:

Date	Net payout to producer per hundredweight of milk, 4 per cent butterfat	Date	Estimated average cost per hundredweight by formula, 4 per cent butterfat
1936		1936	
May	1.96	July series	\$1.94
November	2.35	January series ..	2.03
1937		1937	
May	2.22	July series	2.14
November	2.47	January series ..	2.01
1938		1938	
May	1.82	July series	1.92
November	2.07	January series ..	1.98
1939		1939	
May	1.88	July series	1.98
November	2.12	January series ..	1.96

It is recognized that the net return to the producer from the marketing agency referred to will not represent the net return to producers from other marketing agencies. The trend, however, will be the same in all instances.

In the course of the survey, the investigators attempted to determine whether: (1) the prices paid to producers under the various Board orders have been sufficiently high to enable them to cover all costs, including a wage to the management and a return on the investment; and (2) the physical equipment on the dairy premises showed signs of neglect that could be attributed, in part, to the insufficiency of producer income.

There was a general feeling among the producers of B-grade raw milk that the prices received during the period from 1934 to 1940 were satisfactory. The investigators visited some dairies where there was considerable evidence of physical deterioration of plant facilities that seemed unwarranted. The operators of the dairies on these premises usually offered one or the other of the following excuses: (1) the dairy farm was rented and the owner of the property refused to pay for the necessary repairs; or (2) the quota allocated by the Board was insufficient to enable the operator to utilize his farm most effectively. Practically all of the dairy farms visited were in need of some

* United States Department of Agriculture Oregon farm price on loose hay per ton, oats per bushel, and monthly farm wages without board. The foregoing price series is published quarterly in *Crops and Markets*, United States Department of Agriculture publication.

repair. The deterioration was not necessarily related to the problem of milk sanitation, although some repairs would make possible greater milk sanitation.

It appears that the prices paid the B-grade milk producers have been adequate to bring forth the milk required to meet all consumer demands. This seems evident from the following: (1) prices paid for quota rights prior to June 1939 indicated that the right to share in the fluid-milk market yielded something above a normal return which made it possible for factory-milk producers to pay a substantial sum for this privilege; and (2) the production of milk for the Portland market has been upward since 1935.

FACTORS AFFECTING THE PRODUCER'S INCOME FROM THE SALE OF MILK

Deductions from the payout to the producer. The established price to distributors for butterfat used in the bottle and can trade is 58 cents per pound. The producer receives this amount less deductions for transportation, the test laboratory fee, and the expenses incurred in the pooling operations. Transportation costs are not as serious a problem in the Portland milkshed as they are in several other milk markets in the United States. The close proximity of the market to the source of supply of milk keeps transportation costs to an average of less than 10 per cent of the price paid to the producer for his product, f.o.b. the distributing plant. The Dairy Cooperative Association operates its own trucks for collecting the milk of all but eighteen of its members, whereas transportation is contracted for with independent haulers by the members of each of the other producers' groups. The cost of operating the butterfat testing laboratory for the B-grade shippers is paid for by an assessment of $\frac{1}{4}$ cent per pound of butterfat, one-half of which is borne by the distributors and one-half by the producers. The producer-distributors do not use these facilities, hence are not assessed for their upkeep. One distributor and one producers' marketing association have refused to contribute to the maintenance of the testing laboratory. The latter has withheld payment on the basis that it is a cooperative milk producers' association engaged in the work of processing and distribution and, as such, should not be assessed for the cost of testing.

A relatively small portion of the butterfat is shipped into the market as B-grade farm-separated cream. The shipper of farm-separated cream is required to equalize on the basis of the established price of 58 cents per pound of butterfat. He is credited with the pool price less the estimated differential value of the skim, which is based on the price of skimmed milk as set by the Board less the savings in freight resulting from shipping butterfat in the form of cream. The present order charges the cream shippers for the skimmed milk retained on the farm. On the other hand, the plants that separate whole milk for cream to be used in the bottle and can trade are not charged for the skim.

The B-grade producers in the milkshed equalize on a uniform basis—that is, they receive the same gross on quota. They do not receive a uniform payout price, however, through their several marketing agencies. The net payout prices vary for the following reasons: (1) the marketing agents sell their surplus milk to several buyers at varying prices; (2) the marketing agents do not perform identical services, therefore the cost of operating the different group pools is not the same; and (3) the marketing agents do not make a uniform charge for similar services.

Pertinent data have been assembled and submitted to the Board on pool payouts. The data in the Board's possession show an average variation of as

much as 2.26 cents in payouts by the different marketing agencies for each pound of butterfat. Differences in the pool payouts are inevitable in view of the lack of uniformity of services provided by the marketing agencies.

There is considerable variation also among the several groups relative to pooling. Only two of the marketing agencies have made allowance for bad debts; namely, the Dairy Cooperative Association and the Farmers Dairy Association, the latter in connection with its distributing business. The above-named associations likewise are the only groups that actually collect and distribute all of the funds from the sale of milk through the pool. The Portland Independent B Grade Association makes the collections and payments for part of the sales only. Payments to the producer-members of the other agencies are made directly by the dealers.

The fact that the several marketing agencies have failed to standardize their services raises the question whether more uniformity is to be desired. Those who answer this in the affirmative maintain that a maximum of services, such as those offered by the Dairy Cooperative Association, is necessary to insure a stabilized market. This assertion can not be denied or maintained without more complete data outlining the basic surplus, the market surplus, and the percentage of degrades daily by the membership of each of the marketing agencies for a period of not less than one year.

TRADE PROBLEMS

Quotas, pooling, and equalization. A point of contention relative to the administration of the Milk Control Law in Portland finds root in the problems that arise out of pooling. Opposition to certain of the provisions of the pooling order now in effect comes from the producer-distributor and the producer. The producer-distributor finds it difficult to understand the point of separation between his role as a producer with the consequent responsibilities that he must share with the B-grade producers under the restraining features of a market-wide pool, and his role as a distributor. Thus, he cites as a grievance the fact that his quota does not permit him to supply an expanding A-grade raw-milk market profitably because of the equalization levied against him. It is well to remember that the quota applies to the producer-distributor in his capacity as a producer and to this extent he is not penalized more severely for production above his quota than the producer of B-grade milk.

A second handicap that allegedly is imposed upon the producer-distributor by reason of the joint pooling with the B-grade producers is the requirement that he absorb part of the burden of maintaining a basic surplus, through equalization. This is said to be inequitable according to the producer-distributor, because he meets the actual bottle and can requirements of his trade in the distributing function. The ability of the producer-distributor to serve his market is said to be due to a fair degree of correlation between the seasonal fluctuations in production and the demand of his retail trade. This asserted distinction between the production requirements of the producer-distributor and the B-grade producer has, in effect, been given generous recognition by the Board in Order 121A which provides that, for purposes of computing equalization payments, the producer-distributors are responsible for a maximum of a 5 per cent basic surplus. This compares favorably with the average 10 per cent basic surplus carried by the B-grade producers. The above differential in basic surplus of about 50 per cent relieves the producer-distributor of the burden of maintaining a surplus, insofar as equalization payments are concerned, to cover fluctuations of a seasonal character.

The investigators have found no reasonable grounds for relieving the producer-distributor from the other 5 per cent in the basic surplus which provides a cushion to absorb the fluctuations in supply and demand of an unpredictable nature, not shown in the monthly averages. In fact, there is some question whether the producer-distributor should be given preferred treatment in the entire matter of carrying a surplus within the quota. If the seasonal fluctuations in home-delivery demand tend to correspond to the natural fluctuations in production, this will be true of the retail business of the distributor as well as that of the producer-distributor. It follows, therefore, that seasonal production requirements of the B-grade producer may be substantially the same as those of the producer-distributor. No definite statement can be made, however, until there is more statistical evidence bearing on this problem, particularly from producer-distributor groups.

The opposition from the producer-distributor may be attributed also to his refusal to view the market as a whole. The total sales in the bottle and can trade appear to have reached a point where a substantial increase may not be expected in the near future. If this assumption is valid any appreciable increase in the sale of A-grade raw milk can be effected only at the expense of the B-grade producer. The question then arises, should the quotas of the producer-distributors and the producers be fixed to maintain a status quo as to their relative share in the market, or should they be adjusted to permit a division of the market based on the relative demand for A-grade raw milk and A-grade pasteurized milk. If it is believed that the milk market should be considered as one market, thereby placing no special significance on the fact that milk may be graded "A" because of production in that form or by reason of pasteurization, the present order is equitable. The producer-distributor may purchase any amount of pasteurized milk to meet the requirements of his trade. He maintains his share of the total market as a producer and he may increase his business as a distributor. On the other hand, it may be contended that A-grade raw milk and pasteurized milk are two different products each with a separate demand, and that the public should be free to choose which it will consume. If this view is taken, it is reasonable to believe that the effect of the present order is to restrict a shift in sales from pasteurized milk to A-grade raw milk. This is due to the fact that the producer-distributor may not sell A-grade raw milk in excess of his quota unless: (1) he is willing to equalize on the basis of the difference between the bottle and can price and the basic surplus price established by the Board, or (2) he is successful in developing a market for A-grade raw milk that has been produced and bottled on the farm of some other producer. Neither of these alternatives offers a practical solution to the problem when viewed in terms of the competitive position of the producer-distributor with the distributor. The expedient tried in the Eugene market; namely, to base the quota of the producer-distributor on his sales in the bottle and can trade, would solve this immediate problem. It is objectionable, however, to the extent that it does not treat the A producers and B producers uniformly. It may be said that an intelligent solution to the foregoing problems is not possible until a more accurate record of the producer-distributor sales in the bottle and can trade is available. In fact, the producer-distributors could not make a case on the basis of the sales now reported to the Board.

There was an observable absence of complaint regarding the quota system among the B-grade producers visited as compared with the producer-distributors. The principal objections relative to pooling voiced by producers were that they did not have large enough quotas and that the rigidity in production neces-

sary to maintain their quotas is too severe. The size of the quotas is a function of the total sales in the bottle and can trade and is treated in another section of this report. The second contention, however, is pertinent to the present discussion. The rigidity in production required of the producer in order that he may maintain his quota is especially burdensome to the small dairyman. Small herds make it relatively difficult to maintain a stated minimum production. For example, it is not possible to experience complete success in planned breeding. The only forms of protection available to the small producer are: (1) to buy a cow when his production falls off; (2) to produce a surplus above his quota; or (3) to petition the Board, in affidavit form within ten days, for special consideration. None of these alternatives is entirely satisfactory. It is not possible to say whether some tolerance in production should be permitted. A compilation of the daily production and degrades* of B-grade shippers for a period of one or two years preceding the effective date of the present order, and a comparison of these data with the quotas for the same period are prerequisite to a satisfactory answer. Some degree of tolerance could be insured by tightening up on degrades through reducing the present period of one month of grace.

Reports from the producer-distributors. The Milk Control Board has not attempted to audit the records of the producer-distributors. This policy places a premium on dishonesty, for the under-reporting of sales in the bottle and can trade reduces the equalization charge and the poundage and pooling fees. A rather general tendency to under-report sales would account, in part, for the apparent decline in the consumption of fluid milk in the Portland market. It is not unreasonable to assume that a policy of continuously auditing the reports of certain of the producer-distributors, covering all of them over a period of years, backed up with penalties when the reports are found to be false, might bring about greater accuracy in their statements, hence a more equitable distribution of the burden of equalization and a more valid foundation for making Board orders.

Marketing costs. There is a pronounced variation in the size of the distributors engaged in selling milk at wholesale and retail in the city of Portland. This ranges from the small producer-distributor with a volume of less than one hundred quarts of milk a day to the distributor who operates more than fifty milk routes and serves approximately twenty-five per cent of the market. The marketing services performed by the distributors and the producer-distributors are essentially the same. A study of the distribution costs may be resolved, therefore, to that of the relative operating efficiency of the various enterprises.

The distributing function consists of processing, packaging, and delivering milk and cream. Perhaps the most serious obstacle in the way of realizing economies in processing is the amount of duplication of distributing plants. This condition, which prevents an economic utilization of plant facilities, is largely responsible for the apparent high costs of several of the distributors and producer-distributors. An unnecessary duplication of processing plants, of delivery facilities, and of delivery routes characterizes the market-milk industry in most cities. In this respect Portland is no exception. A reduction in the number of distributors in the Portland metropolitan market has occurred since 1934; however, there are now 102 firms engaged in distributing milk in

* Dairies that fail to pass the periodic city sanitary inspection for B-grade milk are deprived of their right to sell their product in the bottle and can trade until all sanitary requirements are met.

the metropolitan area. This figure includes 84 producers who are marketing their own products and 18 distributors who buy milk from the producers. No one of the firms handles a sufficient volume of the milk business or controls a sufficient amount of facilities to constitute a monopoly in the industry. The Milk Control Board has no direct power to force greater economies in the distribution branch of the industry; however, through its power to license distributors and to establish minimum buying prices on butterfat to distributors and to consumers the Board has an indirect authority that has not been fully explored.

A secondary variant in the cost of processing is the quality of the management. This factor cannot be evaluated intelligently by casual observation. It must be analyzed objectively with the aid of accurate cost data. There appears to be a causal relationship between the problem of utilization of plant capacity and the extent of duplication in delivery. Much overlapping of delivery routes, wholesale and retail, was in evidence. The producer-distributors are responsible, in part, for the large numbers, especially in the home delivery. Several instances were noted in which a producer-distributor was covering more than fifty miles a day on one small milk route. The duplication of routes in the wholesale channels is accompanied by a condition wherein the bulk of the business at the good accounts is given to the dealer who makes the best price concession. The rest of the business which is to accommodate purchasers who insist on a particular brand of milk is divided among several distributors, none of whom deliver enough units to make the stop economical. Doubtless there is considerable variation in delivery costs among the enterprises engaged in the distribution of milk in the Portland market. In the first place, as there are differences in the cost of delivering milk in the wholesale trade and in the retail trade, the delivery cost of a distributor is in part a function of the proportion of the units sold in the wholesale and retail trade. Economies incident to wholesale, as distinguished from retail, delivery are: (1) a given volume of milk is delivered with a smaller number of stops; (2) fewer bottle losses, and (3) lower credit losses. In the second place, not only is there lack of uniformity in the cost of delivery between wholesale and retail routes, but among the various wholesale routes. This is due mainly to the fact that some wholesale routes service large chain stores exclusively, while others service the average corner grocery.

The distributors, quite generally, have been trying to encourage their sales of specialty products such as buttermilk, chocolate milk, homogenized milk, vitamin D milk, and orangeade. The direction of the efforts of certain of the distributors along this line has been due to a recognition on their part of the desirability of further utilization of their available plant facilities. Others have followed because of competition. These specialties frequently are not produced in sufficiently large quantities to be on an economical level of output. It may be questioned, therefore, whether certain of the foregoing products are paying their way. It is not sound business practice to encourage the sale of new items unless there are cost studies to show that these products cover their "out-of-pocket" costs and absorb part of the overhead. In no case should any of the cost of these items be absorbed by the sale of milk.

Concern over the large bottle and credit losses was expressed by many of the distributors and producer-distributors. Several enterprises have made some effort to reduce these losses, with varying results. The industry as a whole does not extend credit beyond two months, though there are certain exceptions of this rule. A longer extension of time would, in most instances, appear to constitute an unfair competitive practice.

The bottle losses suffered by the industry in its retail business are relatively high. One of the reasons for this is the fact that many consumers trade in the home-delivery bottles on merchandise at the stores. This is evident from the surplus of bottles which comes back from the retail stores. The bottle loss attributable to this cause can be diminished by a policy of more careful checking in and out of bottles with the drivers and through consumer education. There are at least two other plans that have been tried elsewhere. Under one of these, the dairies supply tokens to the stores, one for every bottle. The tokens are then issued with the milk and cream that is sold to the consumer and no bottles are returnable for credit without them. The other plan calls for a store bottle and a home-delivery bottle, the one made distinguishable from the other. The use of two bottles does away with the objectionable feature of handling tokens. This method is sometimes criticized on the basis of the added cost of keeping the bottles separated in the plant. It is reasonable to assume, however, that the savings in bottle loss will offset the extra costs incurred in the plant.

The investigators have not attempted to make a detailed study of the costs of marketing milk in Portland. They have attempted, however, to point out some of the variables that make the establishment of a minimum wholesale and retail price structure on milk in the city extremely difficult, and to show that the Board is not in a position to arrive at a scientific price structure until a thorough study of the costs of marketing milk is completed.

Paper containers. There was some evidence of interest among the members of the industry concerning the possibility of introducing the paper container. The introduction of a new type of container requiring a change in bottling is not feasible from a cost standpoint unless the distributor makes a complete change-over. It is evident that paper packages can be used effectively and economically provided they are purchased in large quantities at a low unit price. A change-over from the bottle to the paper container would render obsolete much of the existing bottling equipment and for this reason is not likely to receive favorable consideration from some of the members of the industry.

Cream prices. The apparent decrease in the amount of butterfat marketed as cream in Portland has been caused, according to some members of the industry, by the minimum prices established by Board Order 116. These critics assert that the price structure on cream has tended to reduce consumer demand below the level that is to be expected in the community.

The available records show that a market surplus existed in the Portland market except for 2 or 3 days during the period from 1936 through 1939. This surplus milk was sold for manufacturing purposes. The prices obtained for the surplus milk averaged considerably lower than that for milk sold in the bottle and can trade; the maximum difference of approximately 27 cents per pound butterfat was paid in May 1939. If a market surplus of milk continues in Portland, is it reasonable to assume that it can be reduced by lowering the unit price of cream to the consumer? Sufficient information is not at hand in this or any other milk market to answer this question with any degree of certainty. The answer will come only through a process of experimentation with the price structure on cream that will determine, in part, the degree of consumer response to price changes in this product.

Regardless of the effect on demand of the present price structure for cream, the question arises whether present cream prices are out of line on the

basis of cost. For comparative purposes the minimum price structure for given units of milk and cream is listed below:

Per cent butterfat test	Weight of butterfat		Cost of butterfat to distrib- utor in quart unit	Selling price to consumer	Margin per unit	Cost to consumer per pound of butterfat
	In quart unit of product	In one-half pint units				
4	Pounds .086	Pounds	Cents 4.988	Cents 11	Cents 6.012	\$1.28
5 .....	.1075	.....	6.235	13	6.765	1.21
22 .....	.4635	.....	26.883	45	18.117	.97
33 .....	.6864	.....	40.811	60	19.189	.87
22 .....	.....	.1158	6.716	15	8.284	1.29
33 .....	.....	.1716	9.953	18	8.047	1.05

Based on the foregoing data, it appears that the prices charged for the butterfat equivalents in cream and milk are generally lower for cream than milk. To the extent that the consumer desires to purchase butterfat in the form of cream, there is a definite price advantage to that form of purchase, except in 22 per cent butterfat cream sold in one-half pint containers.

The pricing of butterfat in cream should be considered in terms of the relative costs of processing, packaging, and delivering cream and milk. It is impossible to obtain accurate cost data on these marketing functions. Certain observations have been made, however, that tend to point to an answer to this problem:

1. The cost of processing, bottling, and delivering butterfat in the form of milk or cream is about the same per bottle.
2. The cost of processing, bottling, and delivering butterfat in cream is less per unit of butterfat in cream than milk, which is due to the higher butterfat content per bottle of cream as compared with milk. This is true despite the fact that there is a greater plant loss in terms of butterfat in the pasteurizing and bottling of cream.

Price cutting. Variations from the legal minimum price structure are many. In the first place, there are flagrant violations by the wholesale trade of Order No. 116. These take the form of secret rebates of from 10 to 15 per cent, the installation of rent-free ice-cream cabinets and other concessions coming under the heading of free goods or services.* It appears that this form of competition is attributable to: (1) an attempt to obtain fuller utilization of plant facilities, thereby to realize a lower unit cost in processing; (2) a relative economy of servicing large wholesale stops as compared with the small stops; and (3) an excessive operating margin under the existing price structure. Price cutting has reached such proportions that it appears to be the rule rather than the exception, in the entire portion of the wholesale business in which it can be employed advantageously. There is a much better maintenance of the prices set by the Board in the retail trade. Variations from the legal minimum have been confined, in the main, to the four-quart customers who are given the wholesale price.

Industry attitude. The members of the industry defend their present state of non-compliance with the Board's orders relating to prices and trade

* Annual rental value of ice-cream cabinets: 2-, 3-, and 4-hole cabinets and compressor, \$26.25; 6- to 12-hole cabinet and compressor, \$35.00; 6- to 12-hole cabinet only, \$17.50; compressor only, \$17.50.

practices on the grounds that, assertedly, the Board has not prosecuted clear cases of violations that have been brought to its attention. It appears, however, that the Board's effort to prosecute violators have been frustrated considerably because of the unwillingness of members of the industry to appear as witnesses against violators.

The investigators believe that the widespread price cutting might be due, in part, to an unlawful use by some distributors of surplus butterfat in the bottle and can trade which gives to the offending distributors a larger spread than that provided under the Board's minimum price order. If all use of surplus butterfat were stopped and the offending distributors were forced to pay the legal minimum price for all butterfat used in the bottle and can trade, it is doubtful whether price cutting could long continue on the present scale.

The industry, as a whole, desires to maintain the Milk Control Act because it provides certain important benefits to the industry without the Board requiring it to assume an equal number of responsibilities. As long as the industry can continue to operate under its present state of security, it will continue to depend on the Board to carry the torch of responsibility.

ACKNOWLEDGMENTS

Thanks are due to the numerous producers, producer-distributors, distributors, and producers' marketing agents for their willingness to aid the authors in assembling the factual data for this report. The unlimited assistance and cooperation of the members of the staff of the Oregon Milk Control Board deserve special recognition. The criticisms and suggestions of several staff members of the School of Agriculture, Oregon State College, were most helpful in bringing this report to its present form.

OREGON STATE BOARD OF HIGHER EDUCATION

F. E. Callister	<i>Albany</i>
Beatrice Walton Sackett	<i>Marshfield</i>
C. A. Brand	<i>Roseburg</i>
E. C. Sammons	<i>Portland</i>
Robert W. Ruhl	<i>Medford</i>
Edgar William Smith	<i>Portland</i>
Willard L. Marks	<i>Albany</i>
R. C. Groesbeck	<i>Klamath Falls</i>
Mac Hoke	<i>Pendleton</i>
Frederick M. Hunter, Ed.D., LL.D.....	Chancellor of Higher Education

STAFF OF AGRICULTURAL EXPERIMENT STATION

*Staff members marked * are United States Government investigators
stationed in Oregon*

Frank Llewellyn Ballard, B.S.....	President of the State College
Wm. A. Schoenfeld, B.S.A., M.B.A.....	Director
R. S. Besse, M.S.....	Assistant Director
Esther McKinney	Accountant
Margaret Hurst, B.S.....	Secretary

Division of Agricultural Economics

E. L. Potter, M.S.....	Agricultural Economist; In Charge, Division of Agricultural Economics
------------------------	---

Agricultural Economics

W. H. Dreesen, Ph.D.....	Agricultural Economist
D. B. DeLoach, Ph.D.....	Associate Economist

Farm Management

D. C. Mumford, M.S.....	Economist in Charge
G. W. Kuhiman, Ph.D.....	Associate Economist
W. W. Gorton, M.S.....	Assistant Economist
H. L. Thomas, M.S.....	Associate Agricultural Economist, Conservation Economic Division, Soil Conservation.
J. C. Moore, M.S.....	State Representative, Division of State and Local Planning, Bureau of Agricultural Economics*
V. W. Baker, B.S.....	Assistant Agricultural Economist, Division of Land Economics*

Division of Animal Industries

P. M. Brandt, A.M.....	Dairy Husbandman; In Charge, Division of Animal Industries
------------------------	--

Animal Husbandry

R. G. Johnson, B.S.....	Animal Husbandman
O. M. Nelson, M.S.....	Animal Husbandman
A. W. Oliver, M.S.....	Associate Animal Husbandman
B. W. Rodenwald, M.S.....	Assistant Animal Husbandman

Dairy Husbandry

G. H. Wilster, Ph.D.....	Dairy Husbandman
I. R. Jones, Ph.D.....	Dairy Husbandman
H. P. Ewalt, B.S.....	Research Assistant (Dairy Husbandry)
R. E. Stout, M.S.....	Research Assistant (Dairy Husbandry)
V. P. Smith, B.S.....	Research Assistant (Dairy Husbandry)

Fish and Game Management

R. E. Dimick, M.S.....	Wildlife Conservationist in Charge
F. P. Griffiths, Ph.D.....	Assistant Conservationist*
A. S. Einarsen, B.S.....	Associate Biologist, Bureau of Biological Survey*
Jay B. Long, B.S.....	Research Assistant (Fish and Game Management)

Poultry Husbandry

H. E. Cosby	Poultry Husbandman in Charge
W. T. Cooney, B.S.....	Research Assistant (Poultry Husbandry)

Veterinary Medicine

J. N. Shaw, B.S., D.V.M.....	Veterinarian in Charge
E. M. Dickinson, D.V.M., M.S.....	Associate Veterinarian
O. H. Muth, D.V.M., M.S.....	Associate Veterinarian
R. W. Dougherty, B.S., D.V.M.....	Associate Veterinarian
A. S. Rosenwald, B.S., D.V.M.....	Assistant Veterinarian
Roland Scott, D.V.M.....	Research Assistant (Veterinary Medicine)†
Richard Shuman, D.V.M.....	Junior Veterinarian, Bureau of Animal Industries*
M. P. Chapman, B.B.M.....	Research Assistant (Veterinary Medicine)*
K. S. Jones, D.V.M.....	Research Assistant (Veterinary Medicine)

* On leave.

STATION STAFF—(Continued)

Division of Plant Industries

G. R. Hyslop, B.S.....Agronomist; In Charge, Division of Plant Industries

Farm Crops

H. A. Schoth, M.S.....	Agronomist; Division of Forage Crops and Diseases*
D. D. Hill, Ph.D.....	Agronomist
R. E. Fore, Ph.D.....	Associate Agronomist
H. H. Rampton, M.S.....	Assist. Agronomist (Division of Forage Crops and Diseases)*
L. E. Harris, M.S.....	Assistant Agronomist
H. E. Finnell, M.S.....	Assistant Agronomist
Elton Nelson, B.S.....	Agent, Division of Cotton and Other Fiber Crops and Diseases*
Louisa A. Kanipe, B.S.....	Junior Botanist, Division of Seed Investigations*
A. E. Gross, M.S.....	Research Assistant (Farm Crops)
L. R. Hansen, M.S.....	Research Assistant (Farm Crops)
Henry R. Fortmann, B.S.....	Research Graduate Assistant (Farm Crops)

Food Industries

E. H. Wiegand, B.S.A.....	Technologist in Charge
T. Onsdorff, M.S.....	Associate Technologist
D. R. Mills, B.S.....	Assistant Technologist
E. W. Harvey, M.S.....	Research Assistant (Food Industries)

Horticulture

W. S. Brown, M.S., D.Sc.....	Horticulturist
H. Hartman, M.S.....	Horticulturist (Pomology)
A. G. B. Bouquet, M.S.....	Horticulturist (Vegetable Crops)
C. E. Schuster, M.S.....	Horticulturist (Division of Fruit and Vegetable Crops and Diseases)*
W. P. Duruz, Ph.D.....	Horticulturist (Plant Propagation)†
G. F. Waldo, M.S.....	Associate Pomologist (Division of Fruit and Vegetable Crops and Diseases)*
E. Hansen, M.S.....	Assistant Horticulturist (Pomology)
A. N. Roberts, B.S.....	Research Assistant (Horticulture)

Soil Science

W. L. Powers, Ph.D.....	Soil Scientist in Charge
C. V. Ruzek, M.S.....	Soil Scientist (Fertility)
M. R. Lewis, C.E.....	Irrigation and Drainage Engineer, Soil Conservation*
R. E. Stephenson, Ph.D.....	Soil Scientist
E. F. Torgerson, B.S.....	Associate Soil Scientist (Soil Survey)
J. M. Haley, B.S.....	Assistant Irrigation Engineer, Cooperative Agent, Soil Conservation Service*
A. W. Marsh, M.S.....	Research Graduate Assistant (Soils)
H. E. Clark, B.S.....	Research Graduate Assistant (Soils)
H. E. Dregne, M.S.....	Research Graduate Assistant (Soils)

Agricultural Chemistry

I. S. Jones, M.S.A.....	Chemist in Charge
R. H. Robinson, M.S.....	Chemist (Insecticides and Fungicides)
J. R. Haag, Ph.D.....	Chemist (Animal Nutrition)
D. E. Bullis, M.S.....	Associate Chemist
M. B. Hatch, M.S.....	Assistant Chemist
J. C. Lewis, M.S.....	Assistant Chemist

Agricultural Engineering

F. E. Price, B.S.....	Agricultural Engineer in Charge
W. M. Hurst, M.A.....	Agricultural Engineer, Bureau of Agricultural Chemistry and Engineering*
H. R. Sinnard, M.S.....	Associate Agricultural Engineer (Farm Structures)
C. I. Branton, B.S.....	Assistant Agricultural Engineer†
G. R. Stafford.....	Engineering Aid, Bureau of Agricultural Chemistry and Engineering*
H. F. Carnes, B.S.....	Junior Agricultural Engineer, Bureau of Agricultural Chemistry and Engineering*
L. M. Klein, B.S.....	Mechanical Engineer, Bureau of Agricultural Chemistry and Engineering*

Bacteriology

G. V. Copson, M.S.....	Bacteriologist in Charge
J. E. Simmons, M.S.....	Associate Bacteriologist
W. B. Bollen, Ph.D.....	Associate Bacteriologist
F. J. Rudert, Ph.D.....	Research Assistant (Bacteriology)

Entomology

D. C. Mote, Ph.D.....	Entomologist in Charge
-----------------------	------------------------

† On leave of absence.

STATION STAFF—(Continued)

B. G. Thompson, Ph.D.	Associate Entomologist
S. C. Jones, M.S.	Assistant Entomologist
K. W. Gray, M.S.	Assistant Entomologist
H. E. Morrison, M.S.	Assistant in Entomology
Joe Schuh, M.S.	Assistant in Entomology

Home Economics

Maud M. Wilson, A.M.	Home Economist
Helen McCullough, M.A.	Assistant Home Economist

Plant Pathology

C. E. Owens, Ph.D.	Plant Pathologist in Charge
S. M. Zeller, Ph.D.	Plant Pathologist
F. P. McWhorter, Ph.D.	Plant Pathologist*
B. F. Dana, M.S.	Plant Pathologist (Division of Fruit and Vegetable Crops and Diseases)*
F. D. Bailey, M.S.	Associate Plant Pathologist (Agricultural Marketing Service)*
P. W. Miller, Ph.D.	Associate Pathologist (Division of Fruit and Vegetable Crops and Diseases)*
G. R. Hoerner, M.S.	Agent (Division of Drug and Related Plants)*
John Milbrath, Ph.D.	Assistant Plant Pathologist

Publications and News Service

C. D. Byrne, Ed.D.	Director of Information
E. T. Reed, B.S., A.B.	Editor of Publications
D. M. Goode, M.A.	Editor of Publications
J. C. Burtner, B.S.	In Charge of News Service

Branch Stations

L. Childs, A.B.	Superintendent, Hood River Branch Experiment Station, Hood River
F. C. Reimer, M.S.	Superintendent, Southern Oregon Branch Experiment Station, Talent
D. E. Richards, B.S.	Superintendent, Eastern Oregon Livestock Branch Experiment Station, Union
H. K. Dean, B.S.	Superintendent, Umatilla Branch Experiment Station (Division of Western Irrigation Agriculture), Hermiston*
Obil Shattuck, M.S.	Superintendent, Harney Branch Experiment Station, Burns
H. B. Howell, B.S.	Superintendent, John Jacob Astor Branch Experiment Station, Astoria
Arch Work, B.S.	Associate Irrigation Engineer (Division of Irrigation), Medford*
G. A. Mitchell, B.S.	Superintendent, Pendleton Branch Station (Dry Land Agriculture), Pendleton*
K. B. Platt, M.S.	Superintendent and Assistant Range Examiner (Division of Grazing), Squaw Butte Range Experiment Station, Burns*
R. G. Johnson, B.S.	Leader of Livestock Research Projects, Squaw Butte Range Experiment Station, Burns
M. M. Oveson, M.S.	Superintendent, Sherman Branch Experiment Station, Moro*
E. S. Degman, Ph.D.	Superintendent and Associate Pomologist, (Division of Fruit and Vegetable Crops and Diseases), Medford*
G. G. Brown, A.B., B.S.	Horticulturist, Hood River Branch Experiment Station, Hood River
L. G. Gentner, M.S.	Associate Entomologist, Southern Oregon Branch Experiment Station, Talent
J. F. Martin, M.S.	Assistant Agronomist (Division of Cereal Crops and Diseases), Pendleton*
R. E. Hutchison, M.S.	Assistant Superintendent, Harney Branch Experiment Station, Burns
Bruce Allyn, B.S.	Junior Irrigation Engineer (Division of Fruit and Vegetable Crops and Diseases), Medford*
J. R. Kienholz, Ph.D.	Assistant Pathologist (Division of Fruit and Vegetable Crops and Diseases), Hood River*
R. D. Frichtel, B.S.	Junior Range Examiner (Division of Grazing), Squaw Butte Range Experiment Station, Burns*
Joseph Belanger, B.S.	Cooperative Research Agent, Conservation Experiment Station (Division of Soil Conservation), Moro*