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The Twin Cities Milk Market Picture

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E. Fred Koller

Both milk producers and the public are showing increased interest in the marketing of fluid milk in large city markets. This article presents a current picture of the market and briefly considers some of the problems in moving milk from producers to distributors in a large market such as the Twin Cities.

Some of these problems include: effecting a better organization and structure of the market, more efficient utilization, achieving a satisfactory pricing system, and improving the seasonal production pattern of milk. This article does not consider the marketing of milk from the bottler level to the consumers.

Organization of the Market

To qualify as Grade A producers and plants in the market, minimum inspection standards set by the Minnesota Department of Agriculture and the health departments of Minneapolis and St. Paul must be met.

The 3,600 qualified Grade A producers on the market in 1957 were located in 22 Minnesota and Wisconsin counties. They constitute only 12 percent of all farms reporting milk cows in the area. They delivered 840 million pounds of Grade A milk into the market. This was only about 20 percent of the whole milk marketed from the supply area.

The number of qualified producers on the market has steadily declined by over 2,000 while annual deliveries of Grade A milk has increased nearly 200 million pounds since the 1946-50 period (table 1). The average daily delivery per producer has more than doubled over this period of years.

Nearly all Grade A milk received in the market is handled by 11 producer cooperatives. The largest of these is the Twin Cities Milk Producers Association (TCPMA) whose 2,622 members supplied about 73 percent of the total milk in the market.

Table 1. Number of Producers, Total Milk, and Average Daily Deliveries per Producer, Twin Cities Milk Market, 1946-1957

Year	Average number of producers	Annual amount of milk delivered	Average daily delivery per producer
		million lbs.	lbs.
1946-1950*	5,782	646	306
1951	5,905	678	315
1952	5,380	702	329
1953	5,722	770	367
1954	5,140	747	398
1955	4,280	670	429
1956	3,750	782	570
1957	3,609	840	638

* Annual average.

Most of the milk for bottling is delivered directly from the farm to the city processing and bottling plants. By agreement of all the cooperative associations in the market, the farm to bottler movement of nearly all milk is managed and coordinated by TCMPA. In this way the movement of milk in the supply area has been kept to a minimum and the cost of transportation and handling has been greatly reduced.

Milk not needed for bottling purposes in the market on a given day ("surplus milk") is diverted to 13 manufacturing plants owned by the 11 producer cooperatives. All but one of these plants is located in the country near the milk supply.

Most of the surplus milk received at the country plants is made into butter, powder, or condensed products, but some is used to supply emergency needs in the market and occasionally some is shipped to other markets. The efficiency of handling surplus milk in the market could be improved by coordinating the processing of the surplus milk in 2 or 3 plants rather than 13.

Utilization of Milk

For pricing purpose to producers, qualified milk is classified according to the value of its subsequent use. Class I includes all bottled milk items such as whole milk, skim, cream, buttermilk, and flavored milk drinks. Class II includes manufactured products such as ice cream, cottage cheese, condensed milk, nonfat powder, butter, and cheese.

The total amount of Class I milk used has increased steadily since before 1950, somewhat in line with increases in the population of the market area. At the same time supplies of Grade A milk have been increasing nearly every year resulting in a 25 to 40 percent annual surplus that must go into Class II products (table 2). While the Twin Cities market lies in an area with huge supplies of milk, the slack season supplies of Class II or "surplus" milk in the market are generally not relatively large. In a group of the 24 largest federal order markets in 1956, only 7 had smaller surplus supplies in the fall months of October and November. This is an indication of the efficient price administration in this market.

Table 2. Utilization of Milk, Twin Cities Milk Market, 1946-1957

Year	Class I use		Class II use		Total milk
	Million lbs.	Percent total	Million lbs.	Percent total	million lbs.
1946-1950*	386	59.8	260	40.2	646
1951	419	61.8	259	38.2	678
1952	440	62.8	261	37.2	702
1953	456	59.2	314	40.8	770
1954	462	61.9	285	38.1	747
1955	499	74.5	171	25.5	670
1956	526	67.3	256	32.7	782
1957	536	63.8	304	36.2	840

* Annual average.

(Continued on page 3)

TIME REQUIREMENTS FOR HOME MILK DELIVERY

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In the United States milk marketing costs took about 56 percent of consumers' expenditures during the third quarter of 1958. So continued efforts are necessary to reduce fluid milk marketing costs.

About 35 percent of fluid milk sales in the Twin Cities are made on home delivery routes. What does home delivery service cost? Can the cost of this service be reduced? An examination of the tasks home delivery route drivers perform and the time associated with each may provide some answers.

Although truck expenses and labor are both important costs involved in providing home delivery service, this preliminary report deals with labor only. During the summer of 1957, detailed information was obtained about 58 home delivery routes of 5 Twin Cities milk companies. Each operation performed by the driver was timed. In addition, route mileage, the type of delivery made, quantities of the various products sold, and the special circumstances of each delivery were noted.

The total time spent in carrying out route activities for the 58 routes averaged 526 minutes per day (table 1).

The 58 drivers spent an average of 42 minutes at the plant before starting their routes. During this time they checked their accounts and picked up and loaded their trucks.

The drivers spent an average of 63 minutes at the plant after returning from their routes. During this period they inventoried their returns, unloaded and garaged their trucks, and checked in the day's receipts. Conferences between the route managers and the drivers were also held at this time.

Table 1. Use of Drivers' Time on 58 Twin Cities Retail Milk Routes

	Average time		Range
		minutes	
Pre-delivery plant time	42		14- 88
Post-delivery plant time	63		15-140
Total plant time		105	
Plant to route drive time	17		3- 47
Route to plant drive time	20		2- 55
Route travel time	95		48-172
Total drive time		132	
Home delivery time			
At parked truck	89		
Walking	60		
At customer's door	82		
Total		231	105-351
Other type delivery time		26	0- 94
Miscellaneous		32	0- 98
Total		526	

The average time required to drive from the plant to the first route stop was 17 minutes. An average of 20 minutes per route was spent driving from the last route stop back to the plant. The average time spent traveling between the first and last route stop was 95 minutes. Total driving time, therefore, averaged 132 minutes for the 58 routes.

While making home deliveries the drivers spent an average of 89 minutes per day at the parked truck. During this time they loaded and unloaded their delivery baskets and recorded the sales for each delivery. Drivers spent 60 minutes in walking from the truck to the consumer's doorstep and back to the truck. An average of 82 minutes was spent at the customer's door. While at the door, the driver took the customer's order, left the products, picked up empty bottles, and occasionally collected accounts. An average of 32 minutes per day was spent soliciting new customers, collecting old accounts, and at personal stops.

In order to add the many different products and package sizes sold on home delivery routes a common unit was needed. For this purpose, milk in quart and half pint containers, cream in half pint containers, and chocolate in pint and half pint containers were established at a value of 1.0. Other products and package sizes were given values which tend to reflect the comparative time involved in handling each.[1]

For all of the routes studied, total driver time per route point averaged .96 of a minute. For each retail delivery, the driver spent an average of 2.31 minutes at each stop from the time he parked the truck at the curb until he completed the delivery and drove away. This amounted to .57 of a minute per retail point.

There were important similarities and differences between the 58 routes studied. Most routes were operated on an every-other-day basis. All routes were primarily home delivery routes. However, on some routes wholesale deliveries and deliveries to institutions and manufacturing plants were also made.

[1] California labor unit modifiers were used for the purpose of combining different products and container sizes. The value of the more important modifiers were milk: quart, half pint 1.0, half gallon 1.8; cream: half pint 1.0, quart, pint 1.2; half and half, skim chocolate, etc: pint, half pint 1.0, quart 1.2; butter: pound 1.2; cottage cheese: 1 pound and under 1.2.

Table 2. Route Characteristics of 58 Twin Cities Retail Milk Routes

	Average volume per route	Range
	points	
Home delivery	402.2	253.6- 693.8
Other	146.0	0-1176.0
Combined	548.2	237.6-1628.2
	Ave. no. deliveries per route	Range
Home delivery	99.5	46- 156
Other	3.6	0- 12
Combined	103.1	46- 158
	Ave. vol. per delivery (all routes)	Range
Home delivery	4.0	2.7- 8.3
Other	40.8	1.0-1032.0
Combined	5.3	2.9- 22.9

The average volume per route was 548.2 points (see table 2). Of these, 402.2 points were delivered to homes and 146.0 points per route were delivered to other types of stops.

The range in the volume of home delivered points per route was fairly wide. This was due largely to the wide range in the number of home delivery stops served—the number ranged from 46 to 156.

Only home deliveries were made on about one-half of the routes. However, a few very large institutional deliveries were made on a small number of routes. This accounted for the wide range in the total volume per route.

The average volume per home delivery for all routes was 4.0 points. At the upper extreme the average volume per delivery was 8.3 points per stop. At the lower extreme it was 2.7 points. One firm used a quantity discount pricing plan on a few routes. Another company had a few routes on which deliveries were made every third day. These practices resulted in high volume per home delivery on a few routes.

How can labor time and labor costs be reduced? The data indicate that there are wide variations in the number of deliveries per route and the volume per delivery. Route reorganizations to increase the number of deliveries per route may be possible. Pricing plans, which pass on the reduced per unit cost of serving large volume stops, may increase volume per delivery. Three-day deliveries present another way in which delivery time and costs may be reduced.

Twin Cities Milk–

(Continued from page 1)

Pricing Milk to Producers

A major problem faced in the administration of a large city milk market is that of pricing milk to producers on a satisfactory basis. Several objectives must be considered such as striking a reasonable balance between milk receipts and sales in the market, keeping milk prices somewhat in line with prices of other farm products, holding prices in line with competing markets, and many other considerations.

Pricing of milk in the Twin Cities market, as in 71 other markets in the U. S., is under Federal Milk Market Order regulation. The federal milk order sets forth the formulas for determining the minimum prices for each class of milk. In this market the formulas for both classes of milk are based on prices of manufactured dairy products.

The Class I price is determined by one of three formulas based on: (1) prices of butter and powder, (2) prices of butter and cheese, or (3) prices paid for milk at 12 Midwest condensaries. Whichever of these formulas results in the highest price for the preceding month becomes the basic Class I price for the current month (see column 1, table 3).

The basic Class I price is then adjusted by the addition of a premium modified by a "supply-demand" adjustment factor (columns 2 and 3, table 3). The resulting adjusted Class I price (column 4) is the minimum price bottlers must pay the producer cooperatives for the milk they receive for processing into fluid products. The premium for Class I milk represents an incentive to producers to produce Class A milk and to cover the added costs of meeting sanitary standards. The premium varies seasonally to also provide an incentive for a more even production of milk throughout the year.

Table 3. Class I, Class II, and Uniform Blend Prices—Twin Cities Milk Market, 1957

Month	Base Class I price	Seasonal premium	Supply-demand adjustment	Adjusted Class I price	Class II price	Uniform blend price
			dollars			
January	3.27	.70	—.06	3.91	3.08	3.63
February	3.25	.70	—.06	3.89	3.08	3.60
March	3.23	.70	—.02	3.91	3.08	3.63
April	3.17	.70	0	3.87	3.09	3.61
May	3.10	.60	+.04	3.74	3.07	3.52
June	3.07	.60	+.04	3.71	3.06	3.51
July	3.06	1.10	+.04	4.20	3.06	3.87
August	3.06	1.10	+.02	4.18	3.09	3.92
September	3.09	1.10	—.03	4.16	3.16	3.99
October	3.16	1.10	—.06	4.20	3.12	3.96
November	3.14	1.00	—.06	4.08	3.09	3.87
December	3.15	.70	—.04	3.81	3.09	3.59
Weighted average				3.97	3.09	3.71

The Class II price in the Twin Cities market is always the current butter-powder formula price with no adjustments or premiums added.

Finally, producers are paid on the basis of the monthly uniform blend price. This is the average of the Class I and II prices weighted by the amounts of Grade A milk used in each class during that month (column 6). This uniform blend price is based on utilization in the market as a whole and not on the utilization that any one cooperative has in the market.

With the great abundance of milk produced in the supply area of the Twin Cities it is very important that the difference between the uniform blend price and the Class II price (manufacturing milk price) not be large. If it were too large, more milk would be attracted to the market and surpluses of Class II milk would be increased greatly. For this reason, the Twin Cities Class I price is at a lower level than most other markets in the country.

Seasonal Production Problem

Attainment of more uniform seasonal milk production is another major problem facing large city markets. Consumption is quite even from month to month. In consequence, wide seasonal production variations will give rise to large surpluses of Class II milk in the flush production months.

During May 1957 cooperative plants received nearly 3 million pounds of surplus Grade A milk and Grade B milk per day. But, during September 1957 the receipts of such milk was down to about 1.4 million pounds, less than half the level of the previous May. These seasonal variations in plant receipts result in higher hauling and processing costs than would prevail if the same total amount of milk were delivered evenly over the year.

The seasonal Class I premium discussed above attacks the seasonal production problem by giving more incentive to producers to freshen cows during the summer and fall rather than in winter and spring. Still another seasonal pricing plan, known as the "base-surplus" plan, is also used in this market to give producers even more incentive to deliver more milk in the slack season.

Under this plan, milk delivered during the last 6 months of the year is all priced at the uniform blend price. But milk delivered during the first 6 months in excess of the average monthly deliveries during the base setting period for each producer (July through October) is priced at only 8 cents over the Class II price. The base price is thus substantially higher than the excess price and also higher than the uniform blend price.

The base-surplus plan has been used by TCMPA since January 1952 and in the market as a whole since February 1956. In 1950 the difference in the TCMPA season index of Grade A production per producer per day between the highest production month and the lowest was 59 percent. In every year since 1950 this difference has decreased until in 1957 it was only 26 percent. In the Twin Cities market the plan has applied only to Grade A milk production and not to Grade B milk.

The main objective of federal order regulation in any milk market has been to create a more stable price and supply situation. This is, in part, accomplished by requiring bottlers to pay minimum prices for Class I milk, regardless of the source of supply. For the Twin Cities producers this has been very important because of the large amounts of milk produced within short distances of the market.

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NOTES

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Minnesota Farm Prices Sept. and Oct. 1958

Prepared by Larry Denison

Average Farm Prices for Minnesota September 1958, October 1956, 1957, 1958*

	Sept. 1958	Oct. 1958	Oct. 1957	Oct. 1956
Wheat	$ 1.82	$ 1.87	$ 2.06	$ 2.03
Corn	1.01	.94	.95	1.12
Oats	.50	.51	.54	.63
Barley	.84	.86	.88	.88
Rye	.98	.97	.99	1.16
Flax	2.68	2.70	3.10	2.98
Potatoes	.71	.45	.92	.66
Hay	13.80	13.80	15.30	16.50
Soybeans†	1.92	1.89	1.97	2.01
Hogs	20.00	18.10	16.60	15.30
Cattle	22.20	21.90	17.10	13.80
Calves	25.20	24.10	18.20	16.40
Sheep-lambs	20.18	20.19	18.38	17.00
Chickens	.098	.093	.103	.100
Eggs	.360	.280	.370	.330
Butterfat	.64	.64	.66	.64
Milk	3.20	3.20	3.45	3.40
Wool†	.32	.32	45	.42

* Average prices reported by the USDA.
† Not included in Minnesota farm price indexes.

Prices received by Minnesota farmers for all commodities decreased 3.8 percent from September to October. This was the largest monthly decrease since October 1956.

Hog and cattle prices, which declined $1.90 and $1.10 per cwt. respectively, was the primary reason for the decrease. However, a decrease of 7 cents a bushel for corn left the hog-corn and beef-corn ratios almost unchanged from September.

Comparison of September and October Prices

Commodity class	Average October prices as a percentage of average September prices
Crops	98.2
Livestock	95.0
Livestock products	96.4
All commodities	96.2

The Outlook Corner—Relative Farm Prices

Cattle and hog prices have gone up more rapidly than milk prices in the last three decades.

Prices received by Minnesota farmers for milk, butterfat, and other important farm products are shown in table 1. All of these prices have risen sharply since 1927.

For most production planning, however, the relationship of the price of one product to the price of another is more important than the absolute level. In 1927-36 a farmer had to sell 25 pounds of hogs to bring as much income as 100 pounds of milk (see table 2). In 1957 he had to sell only 18 pounds of hogs. In other words, hog prices rose more than milk prices.

Cattle and calf prices also rose more rapidly than milk prices. This increase in cattle prices is due to some extent to improved cattle quality. We now have a higher proportion of cattle from beef breeds which bring higher prices than cull dairy cows.

The prices of eggs and turkeys rose more rapidly than milk prices from 1927-36 to 1937-46. Since then they have risen much more slowly. We now must sell more eggs and turkeys than in 1927-36 to bring the same income as 100 pounds of milk.

Although changes in prices are important, changes in efficiency and costs also are important. The big increases in efficiency in poultry production that have come in recent years have offset, at least in part, the disadvantages in prices for eggs and turkeys.

Although the information is not conclusive, the efficiency of hog and beef production probably has increased as much as dairy production. For some farmers the shift in price relationships has then shifted the profit advantage from dairy to beef or hogs.

Production adjustments of an individual farmer must be based upon probable price relationships. They must also be based upon the alternatives available on his farm and upon his abilities.

Table 1. Average Prices Received by Minnesota Farmers*

Product sold	1927-1936	1937-1946	1947-1956	1957
Milk, wholesale (cwt.)	$1.74	$ 2.17	$ 3.38	$ 3.21
Butterfat, cream (lb.)	.34	.42	.72	.65
Cattle (cwt.)	6.16	9.30	19.64	16.90
Calves (cwt.)	8.00	10.79	22.86	19.20
Hogs (cwt.)	6.96	10.82	18.97	17.50
Eggs (dozen)	.190	.247	.360	.283
Turkeys (lb.)	.184	.245	.338	.222

* Calculated from: Minnesota Agricultural Statistics, 1958.

Table 2. Quantity of Products Equal in Value to 100 lbs. Milk

Product	1927-1936	1937-1946	1947-1956	1957
Butterfat (lbs.)	5.1	5.2	4.7	4.9
Cattle (lbs.)	28	23	17	19
Calves (lbs.)	23	20	17	19
Hogs (lbs.)	25	20	18	18
Eggs (doz.)	9.2	8.8	9.4	11.3
Turkeys (lbs.)	9.5	8.9	10.0	14.5

Indexes for Minnesota Agriculture*

	Average Oct. 1935-39	Oct. 1958	Oct. 1957	Oct. 1956
U. S. farm price index	100	237.3	226.0	220.3
Minnesota farm price index	100	211.5	203.2†	189.2
Minnesota crop price index	100	173.9	198.0†	198.9
Minnesota livestock price index	100	255.6	217.9	191.8
Minnesota livestock products price index	100	170.8	183.4†	176.8
Purchasing power of farm products				
United States	100	96.5	95.3	95.8
Minnesota	100	86.0	85.7†	82.3
U. S. hog-corn ratio	14.1	17.8	15.9	13.0
Minnesota hog-corn ratio	17.8	19.3	17.5	13.7
Minnesota beef-corn ratio	14.7	23.3	18.0	12.3
Minnesota egg-grain ratio	20.9	12.5	15.4	12.9
Minnesota butterfat-farm-grain ratio	36.4	38.5	37.1	32.9

* Minnesota index weights are the average sales of the five corresponding months of 1935-1939. U. S. index weights are the average sales for 60 months of 1935-1939.
† Revised.

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