FARM BUSINESS NOTES

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NO. 313 UNIVERSITY FARM, ST. PAUL FEBRUARY 28, 1949

Problems in the Minnesota Dry Milk Industry[1]

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Recent declines in prices received for dry milk products, coupled with increased manufacturing costs, raise a danger signal for the Minnesota dry milk industry. Both of these factors are giving rise to sharply lower producer prices and are likely to speed up the shift back to cream which began in 1947. As more and more farmers revert to cream shipments, volume at dry milk plants will fall and the per pound costs of manufacturing will rise even higher. This will put a serious squeeze on the dry milk industry and might bring about financial difficulties in plants experiencing low receipts and high operating costs.

The production of dry milk products in the United States remained high during 1948 in spite of substantial reductions in the amounts purchased by the government. This indicates that more milk powder moved into domestic channels or was sold abroad by the trade than in previous years. Minnesota continued to be one of the leading states in the production of milk powder. Preliminary reports indicate that in 1948 the dry milk plants of this state manufactured about one fourth of the dry nonfat solids, one fifth of the whole milk powder, and almost one half of the dry buttermilk. More whole milk powder was produced in 1948 than in any other year in the state's history. (Table 1.) This increase in whole milk powder can be attributed to favorable prices and relatively large purchases for shipment abroad.

Table 1. **Production of Dry Milk Products in Minnesota, 1944-1948**

Year	Total production	Dry nonfat solids		Dry whole milk	Dry buttermilk	Dry skimmilk animal feed
		Spray	Roller			
	Thousand pounds					
1944	162,194	52,582	64,166	19,856	24,660	930
1945	222,734	79,411	88,183	31,646	21,826	1,668
1946	245,137	112,498	84,839	27,365	17,677	2,758
1947	210,227	106,167	58,660	22,803	20,060	2,537
1948*	219,306	106,643	56,018	35,790	19,215	2,240

* Preliminary.

Since 1942 the number of Minnesota dairy plants producing dry milk has remained fairly constant at about 110, but there has been a decided increase in the average output of these plants. In 1942 there were 65 plants producing less than 400,000 pounds of powder annually, but there were only 40 plants with this volume of output in 1947. Similarly, there were only 25 plants producing over one million pounds each in 1942, but 56 plants manufactured more than this amount in 1947.

Prices and Costs

Early in 1947 the prices of nonfat dry milk solids dropped sharply from the 14.5-15 cents a pound level, which prevailed during the O.P.A. period, to the government support level of 10 cents a pound for spray powder and 9 cents for roller. In the fall of 1947, however, these prices began to advance and reached record levels in the summer of 1948. Average U. S. prices of nonfat dry milk solids for human use reached 15.8 cents a pound in August and remained near that level during the fall months.

At the close of December, 1948, the government announced that its current funds for the purchase of dry milk were used up. Following this announcement, the price of dry nonfat solids dropped 3 cents a pound in one day and has ranged from 4 to 5 cents under the summer quotations in recent weeks. In February the government announced that it will again buy powder, but it is too early to discover the full effects of this announcement on prices of dry milk. Drops in prices of the product force the plants to reduce drastically the price which they pay for skimmilk. Assuming a yield of 8.5 pounds of nonfat solids from 100 pounds of skimmilk, a 4 cent drop in powder prices would result in a 34 cent per hundredweight reduction in the price farmers can be paid for skimmilk.

Data obtained in a study of Minnesota dry milk plants in 1948 indicate that the average cost of manufacturing a pound of powder in 22 spray drying plants was 4.4 cents per pound in 1947. The average manufacturing cost per

[1] A study conducted with funds provided by the Research and Marketing Act.

Table 2. Average Manufacturing Costs Per Pound of Dry Milk Produced in Minnesota Spray and Roller Drying Plants, 1947

Cost Item	Average cost per pound of powder produced: 22 Spray Plants*	24 Roller Plants*
	Cents per pound	
Plant Expense:		
Labor and payroll taxes	1.19	1.06
Packaging supplies	.88	.81
General supplies	.21	.14
Fuel	1.05	.64
Power, light, and water	.06	.27
Plant maintenance	.19	.18
Depreciation and rent	.55	.27
Other	.02	.03
Total	4.15	3.40
Administrative and General Expenses:		
Administrative	.11	.16
General	.17	.14
Total	.28	.30
Total manufacturing cost	4.43	3.70

* Includes only human food plants.

pound of powder for 24 roller drying plants was 3.7 cents per pound during the same period (table 2).

Labor, packing supplies, and fuel were the three most important items and made up nearly three fourths of the total manufacturing costs. Nearly all of the spray drying plants produced their own power. The roller drying plants on the other hand generally purchased their power and therefore had a slightly higher cost for this item than did the spray drying plants.

Most of the spray drying plants have an additional cost for milk hauling which is not common to the roller plants. The spray drying plants generally receive milk or skim-milk from a number of nearby creameries and transport this milk in tank trucks to the central drying plant. These inter-plant hauling costs averaged .87 cents per pound of powder produced for 21 plants purchasing milk from other plants. Much of the roller drying equipment is located in creameries where most of the milk is received direct from farmers who pay the cost of hauling milk to the local plant.

Table 3. Relationship between Manufacturing Costs per Pound of Dried Milk and Annual Volume of Output in 22 Minnesota Spray Drying Plants, 1947

Cost Items	Powder production in millions of pounds: 0-3.9	4.0-5.9	6.0 and over	Average all plants
	Cents per pound			
Plant Expenses:				
Labor and payroll taxes	1.42	1.17	1.08	1.19
Packaging supplies	.87	.90	.86	.88
Fuel	1.13	1.05	.98	1.05
Depreciation and rent	.61	.64	.44	.55
Other	.61	.45	.44	.48
Total	4.64	4.21	3.80	4.15
Administrative and General Expenses:				
Administrative	.14	.14	.07	.11
General	.25	.19	.10	.17
Total	.39	.33	.17	.28
Total manufacturing cost	5.03	4.54	3.97	4.43
Number of plants	9	7	6	22

The larger spray drying plants appear to have somewhat lower manufacturing costs per pound of powder produced. (Table 3.) The plants which produced over six million pounds of powder annually had an average manufacturing cost of less than 4 cents per pound or over one cent per pound lower than the average manufacturing costs of the 0-3.9 million pound production group. Labor and fuel costs per unit declined as volume increased.

Although the figures on costs for 1948 are not yet available, it is possible to make some estimates since labor, packing supplies, and fuel make up such a high percentage of the total cost. Information secured from the drying plants indicates that wage rates and labor costs have increased about 8 per cent over the average for 1947. Packaging costs have remained about the same, but freight rate increases have raised the total packaging costs slightly. This has been at least partially offset by the increased use of lower-cost waterproof bags in some plants in place of the more expensive slack barrels or fiber drums. The largest increases in costs have occurred in fuel. Increases in the cost of the fuel at the mine or refinery, plus increases in freight charges, have caused rather sharp increases in fuel costs per pound of powder produced. Coal and fuel oil, the two principal fuels, have increased from 20-30 per cent in price since 1947. On this basis plant managers have estimated that average manufacturing costs in 1948 were approximately one half cent per pound higher than in 1947.

Wide Seasonal Production Costly

One of the big factors affecting the cost of producing dry milk powder is the seasonality of production. During the four-year period 1944-1947 the October production was approximately one third of the production during June. As a result of this extreme seasonal variation, many of the facilities which are necessary in order to handle the milk flow during the peak months stand idle for all or part of the remainder of the year.

Since these idle machines continue to depreciate and must be maintained regardless of use, costs are somewhat higher than they would be if production were more uniform throughout the year. There are many other things such as labor which cannot be reduced in proportion to output. When volume falls the plant usually hesitates to lay off experienced men because they may not be available for hiring during the next flush season. This results in less efficient use of labor and higher costs.

In recent years there has been a tendency for dry milk plants to diversify their operations by equipping to produce other types of dairy products. A diversified plant enables the manager to utilize the available milk supply in any of several dairy products with the best market opportunities and the widest profit margin. This change in organization was intensified in 1947 when powder prices dropped to rather low levels. The survey of 85 dry milk plants conducted during 1948 shows that 42 plants are equipped to produce condensed products, 7 can make American cheese, 10 make ice cream, and 17 handle fluid milk. This trend toward diversification is continuing, especially in the larger plants, and may be extended some more as a result of the current low prices of dried products.

Market Development Needed

In view of the current decline in the prices of its products, the industry needs more than ever to turn to the expansion and development of new markets not only at home but also abroad. The use of dry milk in commercial products such as bakery goods, candies, and prepared food mixes as well as in institutional feeding for hospitals, sanitoria, schools, and cafeterias should be advanced aggressively at this time. There is pressing need for educational and promotional programs to increase the use of dry milk products in home baking and cooking. This will help to keep the demand for milk powder at high levels and will reduce the dependence of the industry on government purchases.

More attention should also be given to increasing the efficiency of operations of drying plants so that the lowest possible manufacturing costs may be achieved. Since labor constitutes such a large proportion of total costs, the introduction of more labor-saving equipment and methods should be considered. Fuel is also a high cost item and its most effective utilization should be carefully studied. Some plants have packaged powder in water-proof bags and have reported favorable acceptance of such packages by the trade. More widespread use of containers of this or improved types would tend to lower packaging costs. Educational work among patrons and appropriate milk pricing policies should have a beneficial effect on the serious seasonal production problem facing these plants.

The Problem of Seasonal Milk Production

DALE BUTZ

One of the important problems in the Minnesota dairy industry is seasonality in milk production. Since the amount of milk and cream kept on farms for feeding varies during the year, the receipts at dairy plants fluctuate even more widely than farm production. Deliveries of milk and cream are relatively large in May and June but decline rather rapidly and reach a low point in October and November.

This subject, like the weather, is often discussed in dairy circles, but as yet very little has been done about it in areas outside city milksheds. Many in the dairy industry admit that seasonality in production is a major problem but regard the issue as being insolvable. Dairy interests in some sections of the country have undertaken widespread campaigns among farmers in an effort to cut down the seasonality in milk production. The success of these efforts indicates that even though the seasonality probably can never be eliminated completely in Minnesota, it is possible to reduce it materially.

The extent of the seasonality problem is shown in table 1. On the average, over 11 per cent of the total deliveries of butterfat to Minnesota creameries are made in June. This is nearly twice as much as is delivered in November. Because the dairy plants must maintain facilities to handle the peak load, much of the building space and equipment are not used to capacity during a large part of the year. This increases the cost of operation per unit and in some cases it works a hardship on the plant operators who have certain definite market committments to fulfill.

The seasonal ups and downs in milk production result largely from seasonal changes in production per cow. Seasonal changes in cow numbers are usually very small and thus appear to have little effect on the variation in milk production. The month of calving is one of the chief determinants of the seasonal distribution of a cow's production. The type of feed and the quantities fed as well as the kind and condition of pastures also influence greatly the rate of milk flow. Several other factors such as management of the herd, climate, and relative freedom from insects pests, all affect the quantity of milk produced in different stages of the lactation period.

Higher feed costs and competition for labor in the fall are often cited as evidence of the fact that farmers cannot afford to increase milk production at that time of year. Prices of milk, however, are usually higher in the fall and winter months than during the flush production months of May and June (table 1). The seasonality of prices follows very closely the pattern of butter prices and is smoothed out considerably by the effects of storage operations. Farmers should give careful consideration to seasonal price variations in deciding upon the profitableness of shifting from spring to fall freshening or adopting other means of increasing production in months of highest price.

All possible aid should be given farmers in planning their feeding programs, pastures, and other management problems. New drouth resistant pasture grasses as well as improved pasture fertilization and rotation practices may increase milk production during the late summer months. Feeding of grain or extra roughage in the early fall might prove to be profitable. In all cases, the costs must be balanced against the expected returns in order to make sure that the changes are profitable from the farmer's point of view. If such changes help to even out the tremendous seasonal variation in the milk flow, the efficiency of milk plants could be increased and costs of operation would be lowered.

Table 1. Average Seasonal Variation in Pounds of Butterfat Delivered to Creameries by Minnesota Farmers and Average Index of Seasonality in Milk Prices in Minnesota, 1936-1947

Month	Butterfat Deliveries (Average percentage that each month is of annual total)	Average Price of Milk (Average percentage that each month was above or below average*)
January	8.0	+3.1
February	7.8	+0.1
March	9.0	−3.3
April	9.0	−6.7
May	10.8	−7.2
June	11.3	−7.0
July	9.8	−4.1
August	8.0	−0.1
September	6.7	+4.0
October	6.3	+5.9
November	6.1	+7.6
December	7.2	+7.7

* 13-month moving average used to minimize effects of trend.

Minnesota Farm Prices For January, 1949

Prepared by W. C. WAITE and K. E. OGREN

The index number of Minnesota farm prices for January, 1949, is 239.5. This index expresses the average of the increases and decreases in farm product prices in January, 1949, over the average of January, 1935-39, weighted according to their relative importance.

Average Farm Prices Used in Computing the Minnesota Farm Price Index, January, 1949, with Comparisons*

	Jan. 15, 1949	Dec. 15, 1948	Jan. 15, 1948		Jan. 15, 1949	Dec. 15, 1948	Jan. 15, 1948
Wheat	$ 2.06	$ 2.09	$ 2.92	Hogs	$19.80	$21.50	$26.40
Corn	1.14	1.16	2.46	Cattle	18.70	19.20	20.40
Oats	.70	.69	1.24	Calves	26.20	26.20	25.60
Barley	1.24	1.20	2.45	Lambs-Sheep	21.03	21.16	21.08
Rye	1.43	1.44	2.61	Chickens	.260	.253	.186
Flax	5.75	5.75	6.77	Eggs	.380	.410	.400
Potatoes	1.50	1.35	1.50	Butterfat	.70	.70	.96
Hay	16.80	16.30	14.10	Milk	3.30	3.40‡	4.25‡
				Wool†	.44	.45	.42

* These are the average prices for Minnesota as reported by the United States Department of Agriculture.
† Not included in the price index number.
‡ Revised.

Minnesota farm prices in January were 3 per cent below December. This decline resulted, to a large extent, from an 8 per cent drop in hog prices.

The index of prices paid by farmers was unchanged from December. Farm living costs decreased 2 per cent, with a substantial decrease in clothing prices and some decline in food prices. But taxes payable per acre in 1949 were estimated to be 7 per cent above the 1948 rates, and interest payable per acre up 5 per cent.

The Minnesota farm price index in January was 22 per cent below the record high of a year ago, while the index of prices paid by farmers dropped only 1 per cent. Purchasing power of Minnesota farm products was therefore down 21 per cent from January, 1948.

Indexes and Ratios for Minnesota Agriculture*

	Jan. 15, 1949	Jan. 15, 1948	Jan. 15, 1947	Average Jan. 1935-39
U. S. farm price index	246.8	282.7	239.4	100
Minnesota farm price index	239.5	306.1	242.4	100
Minn. crop price index	209.4	347.0	212.0	100
Minn. livestock price index	270.5	325.9	270.1	100
Minn. livestock product price index	205.1	261.5	214.9	100
U. S. purchasing power of farm products	123.8	140.1	138.5	100
Minn. purchasing power of farm products	120.1	151.7	140.3	100
Minn. farmers' share of consumers' food dollar	59.7†	64.3	62.1	48.4
U. S. hog-corn ratio	16.1	10.9	18.0	12.7
Minnesota hog-corn ratio	17.4	10.7	21.2	14.9
Minnesota beef-corn ratio	16.4	8.3	16.3	11.7
Minnesota egg-grain ratio	14.4	8.9	13.5	15.0
Minnesota butterfat-farm-grain ratio	31.1	22.3	30.7	33.9

* Explanation of the computation of these data may be had upon request.
† Figure for November, 1948.

UNIVERSITY FARM, ST. PAUL 1, MINNESOTA
Cooperative Extension Work in Agriculture and Home Economics, University of Minnesota, Agricultural Extension Division and United States Department of Agriculture Cooperating, Paul E. Miller, Director. Published in furtherance of Agricultural Extension Acts of May 8 and June 30, 1914.

January 1 Livestock Inventory

K. E. OGREN

During 1948 livestock numbers on farms declined slightly to the lowest level since 1939, according to the annual inventory of the Crop Reporting Board. Significant gains were registered in numbers of hogs and beef cattle, with declines in numbers of milk cows, sheep, chickens, and work stock.

The 4-year decline in all cattle numbers was reversed during 1948 through increases in beef breeding herds and feeding operations. The number of cattle on feed was the largest on record and one-fifth above a year ago. Milk cows and heifers declined 2 per cent during 1948, reaching the lowest level since 1931. Yearling heifer numbers were also down, but dairy calves were slightly above a year ago.

Hog numbers were up 4 per cent from a year earlier, but 32 per cent below the record high on January 1, 1944. Increased hog numbers resulted from a larger fall pig crop and a 14 per cent increase in the number of sows and gilts saved from spring farrowings. Other hogs over six months old were 7 per cent below a year ago because of the small 1948 spring pig crop and heavy marketings during the fall months.

The 7 per cent decline in sheep numbers during 1948 was a continuation of the marked downward trend in sheep numbers which has been underway since 1942. Horse and mule numbers also continued their 30-year downward trend during 1948. The January 1 number was 70 per cent below the 1918 peak of 26.7 million.

Table 1. Livestock on Farms, January 1

	1949	1948	Average 1938-47
	Thousand head		
All cattle	78,495	78,126	76,312
Milk cows	24,450	25,039	26,118
Hogs	57,139	55,028	60,584
Sheep	31,963	34,827	49,736
Horses and mules	8,274	9,130	13,115

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