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DRY MILK OUTPUT AND CAPACITY IN MINNESOTA, 1942

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As part of the war effort, the dairy industry is being called on to greatly expand its output of dried milk. The United States Department of Agriculture estimates the total dry skim milk requirements for 1942 at 619 million pounds. This is an increase of 145 million pounds, or 30 per cent, over 1941. Requirements of dry skim milk for human consumption are estimated at 525 million pounds, or an increase of 143 million pounds over 1941.

A large proportion of the increase in dry skim milk output will have to come from creamery territories in Minnesota and Wisconsin, areas in which skim milk is now retained on the farm for feeding purposes. According to a preliminary estimate by the Minnesota Department of Agriculture, Dairy and Food, Minnesota produced 33.4 million pounds of dry skim milk in 1941, or 7 per cent of the national total. In view of the increased output called for in 1942, it appears that Minnesota driers may have to increase their output to 65 or 70 million pounds if the national dry milk goals are to be met.

Number of Milk-Drying Plants

The recent survey of the dry milk industry in Minnesota made by the Divisions of Agricultural Economics and Agricultural Extension, University of Minnesota, indicates that there are 104 plants in the state equipped to dry milk (for plant locations, see map). Drying equipment was idle in the case of only two plants, which are at present manufacturing their milk into other products. Of the 102 active plants, forty are drying milk for human consumption and sixty-two for animal feed. Nine of the 104 drying plants have spray drying equipment, the remainder using roller driers. Eighty-one of the total number of plants are operated by cooperatives.

Present Dry Milk Output

The total daily output of dry milk reported about February first by the forty plants producing powder for human consumption was approximately 280,930 pounds (Table 1). Of this, about 62.1 per cent was dry skim for human consumption and 32.7 per cent was dry buttermilk for human uses. Nearly all of these plants operated on a seven-day week basis.

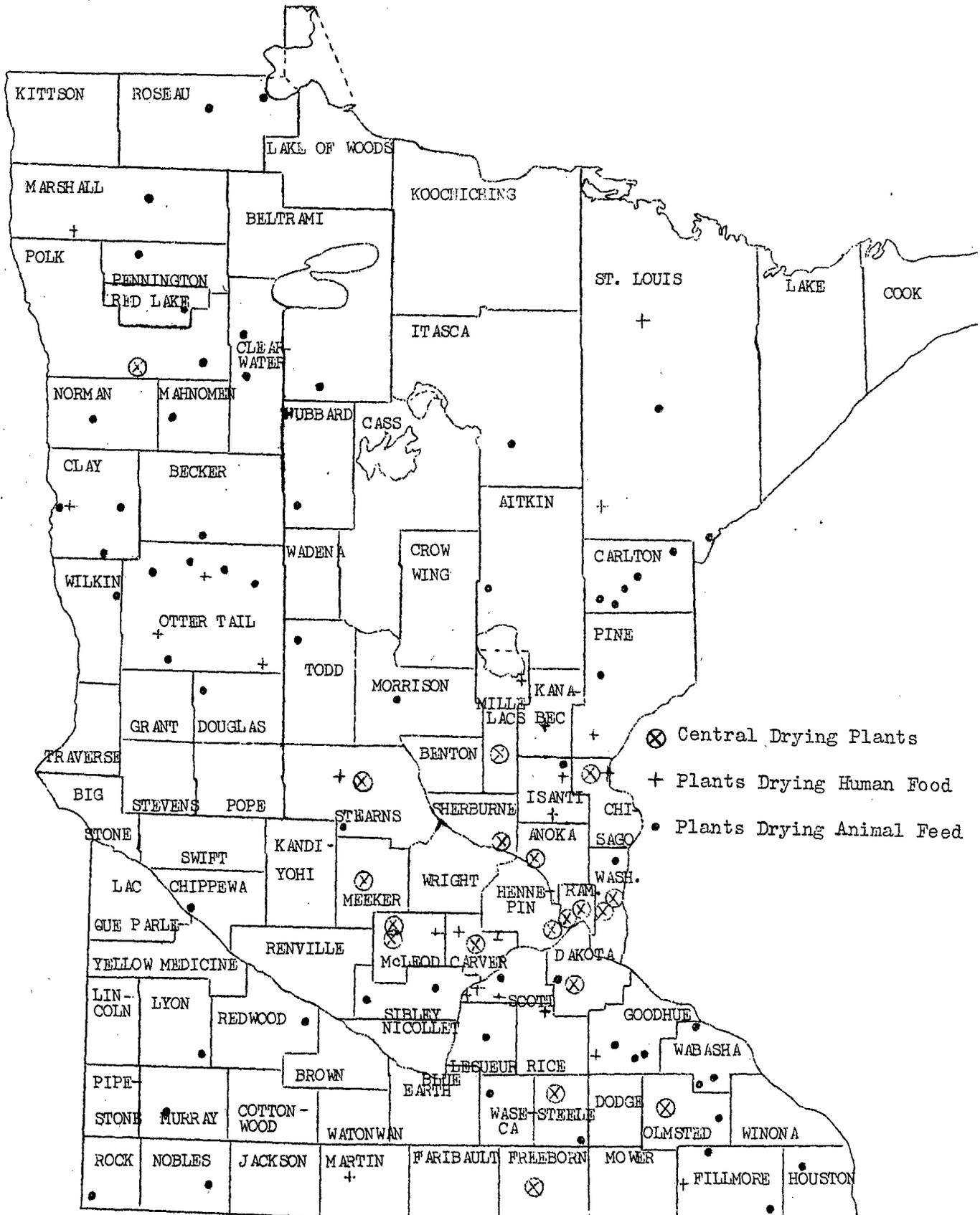
Table 1.

Daily Dry Milk Output Reported by Forty Minnesota Dry Milk Manufacturers Producing for Human Consumption (February, 1942)

Product	Pounds of Powder Per Day	Per Cent of Total Output
Dry skim milk (human food)	174,490	62.1
Dry skim milk (animal feed)	4,310	1.5
Buttermilk (human food)	91,720	32.7
Buttermilk (animal feed)	<u>10,410</u>	<u>3.7</u>
Total	280,930	100.0

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LOCATION OF MILK-DRYING PLANTS IN MINNESOTA, 1942



The dry milk produced by sixty-two manufacturers of powder for feed purposes was approximately 34,670 pounds per day, nearly all of this consisting of dried buttermilk. In most cases these plants dried only the buttermilk produced in their own plants. Only eight of the sixty-two plants dried buttermilk for other creameries. A large proportion of these plants operated their drying equipment for only a few hours on the three or four days a week when butter was churned.

The total output of dried milk reported by all of the above 102 plants for the month of December, 1941, was approximately as follows:

Skim milk (human food)	3,254,000	pounds (approximately)
Skim milk (animal feed).	364,000	" "
Buttermilk (human food and animal feed).	<u>2,595,000</u>	" "
Total	6,213,000	pounds (approximately)

The December output was 77 per cent over the December, 1939 figure, the last December for which monthly output figures in the state are available.

Milk-Drying Capacity

The survey of the daily capacity of milk driers in the state showed that if the forty plants drying milk for human consumption were operated at full capacity (twenty to twenty-four hours a day), their combined output would be approximately 426,000 pounds of powder a day. These forty plants reported that they expected to have an output of about 387,000 pounds of powder a day in June, 1942, or about 90 per cent of full capacity. About February first this group of plants reported a combined output of 280,000 pounds of powder a day, or at 66 per cent of full capacity. Several of the plants are producing at or near 100 per cent of capacity at present. On the other hand, some of the smaller driers are producing considerably below the 50 per cent level.

The sixty-two animal feed driers are working at only 19 per cent of their twenty to twenty-four hour a day and seven-day week capacity.

Inquiry as to the additional equipment needed to operate on a twenty to twenty-four-hour a day basis in the forty human powder plants indicated no major lack of auxiliary equipment such as separators, holding capacity, and truck capacity. Additional equipment of various types would be necessary in a number of plants. Several plants indicated that a lack of milk in their immediate territory would stand in the way of bringing operations to full capacity.

Every effort should be made to bring the output of the forty plants prepared to produce powder for human consumption to 100 per cent of full capacity (twenty to twenty-four hour a day basis) as rapidly as possible. An important advantage of this method is that in this way the industry does not compete on as large a scale for metals, metal-working machinery, and skilled metal laborers now so much needed in the war industries. Also to the degree that existing capacity is fully utilized, the industry may avoid some of the burden of excess capacity when the present unusual demand subsides. Furthermore, by this means large quantities of powder could be obtained in a relatively short time as compared with months of waiting before new drying facilities could be constructed and brought into production.

Additional capacity to dry milk for human consumption is being obtained by converting animal feed driers to human food driers. The survey shows that fifteen of the sixty-two plants now drying milk for feed have taken positive steps to make the necessary changes in their equipment. Nearly all of these plants expected to be producing powder for human consumption by May first. About a half dozen additional plants are in the process of considering conversion plans or are negotiating for equipment, priorities, loans, and making other arrangements. Whether these plants

will ultimately produce powder for human consumption is not yet known.

Further increase in milk-drying capacity is to be obtained by the construction of about nine new or enlarged spray dry plants in the state. Some of these projects (at Rush City, Milaca, Litchfield, and Owatonna) are in the construction stage, while some are still in negotiation with lend-lease authorities.

As of February first, approximately 89 creameries in Minnesota were receiving whole milk and selling their skim milk to other plants for drying. Another twenty-four plants received whole milk directly from farmers, skimmed it, and dried it in their own plants.

Estimate of Dry Skim Milk Output

Estimating the rate of output of dry skim milk (human and feed) in Minnesota in 1942 on the basis of the plants described above, the probable results are about as follows:

40 human powder plants now in production could produce at the rate of 50,400,000 pounds annually
(This assumes a combined output of 140,000 pounds of dry skim a day for 360 days a year. These plants averaged 120,000 pounds of dry skim a day during December, 1941, and reported daily dry skim output to be about 178,800 pounds early in February, 1942. In consequence an estimate of a daily output of 140,000 pounds may be considered conservative.)

15 plants which have taken positive steps to convert animal feed driers to human food driers could produce at the rate of 9,882,000 pounds annually
(These plants reported a combined powder output of 2,745 pounds per hour. Thus they could produce 27,450 pounds in an average ten-hour day. A 360-day year is assumed.)

9 new or enlarged spray dry plants now contemplated could produce additional powder at the rate of 32,400,000 pounds annually

When in full production, the combined output of these sixty-four plants would be at the rate of 92,682,000 pounds annually

The reader should note that it has not been asserted that Minnesota will produce 92 million pounds of dry skim milk in 1942; but if the above plans all materialize, the dry milk manufacturers in the state will be prepared to produce at that rate by the end of the year. An output of 50 million pounds of dry skim powder may reasonably be expected from the forty plants now in production, if milk supplies this summer are normal and if price relationships remain favorable. The fifteen plants in the process of converting from animal driers will not be producing during a large part of 1942 but may be expected to turn out about 5 million pounds of product in the remainder of the year. The nine spray dry plants are least advanced and under priority and construction difficulties may at best produce no more than 5 to 8 million pounds of powder in 1942. Thus the skim milk powder output for Minnesota in 1942 is likely to be near the 60 to 65 million pound level. This is very close to the 65 to 70 million pound output which it was estimated might be required from Minnesota if the national dry milk goals for 1942 are to be achieved.

Further Considerations in the Dry Milk Situation

On the basis of the statistics given above, it is evident that the Minnesota dairy industry has in the past few months made noteworthy strides in equipping itself to supply the dry skim milk for which the government is asking. New milk plant facilities are being constructed; large numbers of plants are converting animal feed driers to human food driers; and nearly all the plants prepared to manufacture human powder have greatly expanded their output with the drying facilities they now have.

Even more can be done to increase the dry skim milk output of the state and without the addition of new facilities in most instances. One of the most significant of these steps is to increase the supply of milk to plants which now operate at less than capacity. In some instances improved prices for skim milk will solve the problem. In other cases access to nearby supplies of milk is blocked by competitive plants which refuse to cooperate with the drying plant in fear that patrons might be lost to them permanently. In some cases the rival plants may even prefer to set up their own milk diversion facilities rather than cooperate. In this war emergency these petty differences should be dismissed and the issue decided by the producers themselves on the basis of the relative advantages of cooperating with the milk drier or some other outlet for their product.

Dry milk output of the state may also be increased without the addition of facilities by the development of a better pasture and better feeding program directed at maintaining a better flow of milk in the late summer and fall months.

With many new plants drying milk for human consumption and many dairy farmers operating on a whole milk basis for the first time, considerable attention will need to be given to quality. Unless this is done, the product will not meet government grade requirements, and serious disappointments may result from the lower returns for milk because of these conditions.

The output of dry skim milk in Minnesota could also be increased if the proportion of this product now being produced by the human food driers was increased. At present about 36 per cent of the product of the forty human food driers is buttermilk powder.¹ Much of this buttermilk could be dried to advantage by the smaller plants throughout the state which are generally producing far below full capacity. This would release capacity for skim milk powder in some of the plants now producing buttermilk powder. Incidentally, this arrangement would have the advantage of eliminating some of the long distance hauling of buttermilk, which very likely is uneconomical.

This survey indicates that further large-scale expansion of drying facilities is not warranted unless new demands should develop. Plants now in the process of converting their animal feed driers to human food driers should complete them. Those contemplating new projects should weigh the situation carefully. While new projects should not be flatly discouraged, only those should be carried through which promise to have considerable value when this emergency is over and which can be maintained when dry skim milk prices return to the more normal levels of 6 and 7 cents per pound.

¹While approximately three-fourths of the dry buttermilk produced in Minnesota plants is for human consumption and this product may be substituted for dry skim milk for many uses, the present demand for lend-lease is for the latter.