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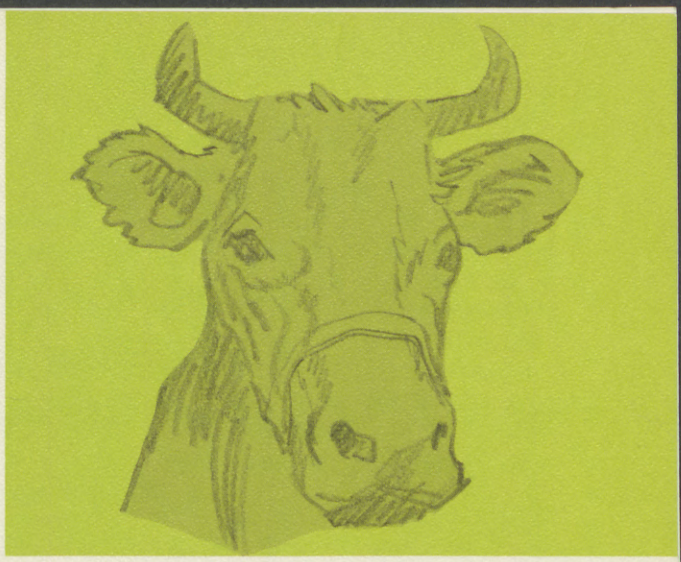

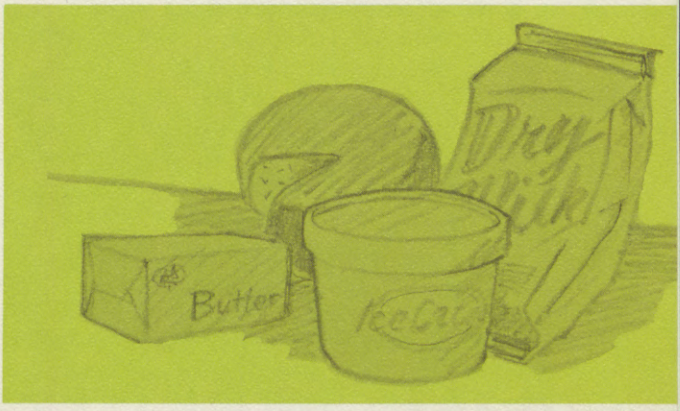

Consequences of Changing Production Standards for Manufacturing Grade Milk

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Almost 80 percent of Minnesota's milk production is manufacturi grade. Thus, the higher manufacturing grade milk standards recommen ed by the U.S. Department of Agriculture (USDA) will have a wid spread impact on Minnesota's milk producers and manufacturers. Sta dards for manufacturing milk have never been as rigid as for fluid u milk, but in the future they will probably be close to or the same as t present grade A production requirements.

Some states already have production standards for manufacturin grade milk based on sediment tests and bacteria counts. The federal go ernment requires specific quality standards for products which it pu chases for price support and other uses. However, there have been n federal requirements for the production of raw milk used in manufacture dairy products.

After salmonella (bacteria causing food poisoning) was found in co sumer packaged instant nonfat dry milk in 1965 and 1966, the U.S. Publ Health Service (USPHS) and USDA began discussions on a program t insure consumer protection. The result, a recommended program to in crease standards for farms producing milk for manufacturing and fo licensed dairy plants, was to become effective July 1, 1969. Because o problems in developing the program's administrative machinery and som hardships for producers, the effective date was delayed.

On October 25, 1969, USDA published its recommended requirement for the production and processing of manufacturing grade milk. Thos interested were asked to submit views or arguments on the recommend tions by March 31, 1970—after which final recommendations would b prepared. Despite delays in the changing of standards, increased sta dards and more costly methods of producing manufacturing grade mi are on the horizon.

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Proposed Standards

The recommended standards that are finally proposed by the federal government will be voluntary for each state. However, when the standards become effective, plants will have to receive milk from certified farms before they can sell the products to the government and to many states. For a farm to be certified, it must meet the recommended standards regarding specified facilities and production methods. Milk which exceeds maximum allowable sediment and bacteria counts and other requirements at receiving plants would need additional inspection and followup to assure compliance. Since Minnesota depends heavily on government and interstate sales, there will be strong economic pressure for state compliance.

In all likelihood the recommended USDA standards in October 1969 will not differ greatly from the final standards. These recommended standards would require numerous changes for some dairy farmers and none at all for others. Minnesota dairy farmers with bulk tanks after July 1, 1969 would probably not be required to make as many changes as farmers without. The Minnesota Milkhouse Law, which became mandatory on July 1, 1969, required that all farms with bulk tanks, even though selling milk for manufacturing uses, meet specific requirements applying to bulk tank, housing drainage, sewage system, water supply, milkhouse construction, doors and access, and lighting and ventilation.

Probable Consequences

What are the implications—if and when—increased standards are adopted for manufacturing grade milk? Several hypotheses may be advanced regarding these developments:

(1) The increased costs and capital requirements will cause some existing dairy farmers to quit dairying and to shift to other farm enterprises, or to leave agriculture altogether.

(2) Others who adopt the new requirements may increase herd size and shift to a more capital intensive milk production unit.

(3) Some producers, being forced to improve standards, will go all the way to grade A milk, which will accelerate the trend to one grade milk.

(4) Manufacturing milk areas will be in direct price competition with the now higher priced fluid milk markets, because of the trend to one grade milk.

The Current Status of Minnesota's Milk Producing Sector

Data from the Crop and Livestock Reporting Service permit breakdown of the total milk shippers in the state into the following designations: grade A, manufacturing milk shipped bulk, manufacturing milk

shipped in cans, and cream sales only. Table 1 summarizes this information for Minnesota and provides a general picture of the number of farms that will most likely be affected by higher sanitary requirements.

Table 1. Number of Minnesota producers by grade of milk—June 1968

Grade milk shipped	Number of farms	Percent of farms	Pounds milk sold (millions)	Percent of milk sold
Grade A	5,067	9.8	2,182	21.4
Manufacturing milk shipped bulk	16,175	31.3	4,058	39.9
Manufacturing milk shipped cans	25,965	50.2	3,678	36.1
Cream	4,480	8.7	264	2.6
Total	51,687	100.0	10,182	100.0

Having complied with the Minnesota Milkhouse Law, most of the 16,175 manufacturing milk producers shipping in bulk tanks will be able to meet the new production standards. These bulk shippers are also the larger dairy producers. For manufacturing milk shipped bulk, 31.3 percent of the farms produce 39.9 percent of the milk, while over 50 percent of the producers shipping milk in cans produced only 36 percent of the milk.

The 25,965 manufacturing producers shipping in cans will be the group most affected by the new state and federal sanitation requirements. For this group, the Minnesota Milkhouse Law does not apply. Many of these farms do not have milkhouses and will very likely have inadequate barns, water supplies, or other equipment to cool milk and clean milking equipment. Most of these farms will be required to make considerable capital investment to continue to sell milk.

Characteristics of Can Shippers

Land Resource Base

A recent survey in Minnesota indicated that about 80 percent of the 25,965 can shippers had fewer than 25 cows and about half had fewer than 100 acres of harvested crops (table 2).[2]

The acreage of these farms indicates (1) their resource base, which in turn suggests their ability to acquire capital to make the necessary investments associated with higher milk standards; and (2) their potential opportunities in other nonlivestock enterprises.

Over 70 percent of the farms with fewer than 15 cows had fewer than 100 acres of harvested cropland. These same farms had a small land resource base averaging about 50 harvested acres. The remaining 28 percent of farms with 1-14 cows had more than 100 acres and averaged about 225

[2] Boyd M. Buxton and Michael J. Hay. "Milk Production Practices on Dairy Farms in the Lake States—1967": unpublished report, Department of Agricultural and Applied Economics, University of Minnesota, 1969.

acres of harvested cropland per farm. This suggests that about 25 percent of the small dairy herds are on larger farms where dairying is probably a relatively small part of the total operation.

Table 2. Estimated breakdown of Minnesota grade B can shippers by size of herd and acres of harvested cropland—1967

Number of cows	Estimated number of farms	Percent of farms	Average acres on farms with: Less than 100 acres — Number of farms	Percent	Average acres	More than 100 acres — Number of farms	Percent	Average acres
1-14	9,580	37	6,890	72	50	2,690	28	227
15-24	11,220	43	4,150	37	70	7,070	63	187
25 plus	5,170	20	1,500	29	56	3,670	71	180
Total	25,970	100	12,540			13,430		

For herds with 15-24 and 25 plus cows, 37 and 29 percent, respectively, have less than 100 acres. These farms averaged slightly more acres of harvested crops than the farms with smaller 1-14 cow herds. The farms with 15-24 and 25 plus cows and over 100 acres of land averaged about 180 acres per farm.

Expansion Potential in Existing Facilities

Another important factor in considering the possible adjustments to higher production requirements, is the extent to which the present dairy housing space is utilized. Larger grade B farms (over 25 cows) shipping milk in cans apparently have little opportunity to expand herd size without running out of barn space. In fact some have apparently expanded beyond available stanchions and are milking cows in batches (switch system) as evidenced by more cows than stanchions (table 3).

Table 3. Estimated number of Minnesota farms shipping milk in cans by herd size, proportion at full barn capacity, and excess number of stanchions on farms with excess capacity—1967

Number of cows	Estimated number of farms	Estimated percent at full barn capacity: Number of farms	Percent	Excess number of stanchions on farms with excess capacity
1-14	9,582	3,737	39	5.3
15-24	11,217	4,823	43	2.8
25 plus	5,167	1,912	37	—3.3[1]

[1] Negative number indicates there are on the average 3.3 more cows than stanchions in the barn, per farm.

For the smaller herds of 15-24 cows, an average of 2.8 extra stanchions per farm were estimated to be available. This group of farms has little opportunity for herd expansion without exceeding present barn space.

The smallest herds shipping milk in cans averaged only 10 cows per farm, but about 61 percent have barn space for about 15 cows. It would be possible for these farms to increase the number of cows milked; however, these are probably the older barns that would require substantial remodeling to meet higher sanitation requirements. Many of these farms probably are limited in obtaining the necessary capital as reflected in a small land resource base.

Representative Grade B Farms

Little information is available on the current status of Minnesota dairy farms in meeting the higher grade B milk standards. However, based on the survey just outlined, several farm situations that probably represent most of Minnesota's grade B can producers are identified (table 4). Situation A, B, and C are farms with a very limited land base, which probably must rely largely on labor intensive livestock enterprises.

Table 4. Characteristics of Minnesota farms shipping milk in cans—1967

Farm characteristics	Representative farm situation					
	Less than 100 cropland acres			100 or more cropland acres		
	A	B	C	D	E	F
Cows in herd	10	20	30	10	20	30
Harvested crop acres	50	65	65	227	180	180
Stanchions	15	23	30	15	23	30
Approximate farms in state represented (1967)	6,900	4,000	1,500	2,700	7,000	3,500

Expansion in livestock would be restricted eventually because of limited land and probable difficulty in obtaining capital on the approximate 12,400 farms represented by situations A, B, and C. Over half or about 7,000 of these low land resource farms have small barns (average 15 stanchions per barn). Since many of these facilities are probably in a poor state of repair, they would require substantial investment to meet the higher milk standards.

Situations D, E, and F are similar to situations A, B, and C except these farms have a larger land base and, therefore, probably have crop enterprise alternatives. Furthermore they can more easily obtain capital for the investment to meet higher milk standards.

The farm alternatives to dairying represented by situation A, B, and C may be beef or hog production. However, the operator with this farm situation is more likely to discontinue farming altogether because of his low resource base than to invest the necessary capital to meet higher milk

standards. Operators with farm situations D, E, and F have greater flexibility and may decide to drop the dairy enterprise and specialize in other livestock or crops. An estimated 13,200 farms in Minnesota were represented by situations D, E, and F in 1967.

Estimated Impact on the Dairy Production Unit

Farms will vary as to the capital investment required to add the necessary facilities to bring milk production up to the higher standards. Therefore, the cost of each investment was determined for 10-, 20- and 30-cow herds (corresponding to farm situation A and D, B and E, and C and F, respectively). Four levels of investment, each based on specified changes that would be required to meet higher milk standards, were evaluated (table 5).

Table 5. Alternative facilities required as a result of increased manufacturing grade milk standards

New facility	Case I	Case II	Case III	Case IV
Milkhouse	Yes	Yes	Yes	No
Barn remodeling	Yes	Yes	No	No
Cooling milk and milk equipment	Yes	Yes	Yes	Yes
Water Supply	Yes	No	No	No
Sewer facilities	Yes	Yes	Yes	No

The October 25, 1969 recommended standards for manufacturing grade milk, as published in the Federal Register, lists all the recommended standards for production, processing, and administering the standards. For farms producing milk for manufacturing, the recommended requirements specify standards for herd health, the milk facility and housing, the milking procedure, cooling milk, a milkhouse or milkroom, utensils and equipment, water supply, and sewage disposal. Some of these requirements do not or would not require additional capital outlay or operating expense, but do require observance of certain procedures in care of the herd, in the milking operations, and in milk handling.

Five requirements of the program, if adopted by Minnesota, could require additional capital outlay and operating expense for the producers. These are the requirements listed in table 5: milkhouse, barn condition, cooling equipment, water supply, and sewage disposal. It is possible that some manufacturing grade producers in Minnesota would have to make outlays for all these requirements. It is more likely that most dairy farms would already meet at least one or more of the requirements. It is also likely that the dairy producers who ship milk in cans and have fewer than 15 cows (about 19 percent of all milk producers) do not have either a milkhouse or mechanical cooling. As herd size for can milk shippers increases, the probability of having an existing milkhouse and mechanical cooling increases.

Costs of Additional Investment

Data in table 6 list the estimated cost for each of several changes that could be made necessary by the program. The milkhouse cost is based on estimates made by rural lumberyards, which are in the business of supplying materials and/or building milkhouses. The necessary structure for all options is assumed to be a 16 by 16 foot structure. A concrete slab and all necessary wiring are also included. Total cost for this is $1,705.

Barn remodeling costs are quite difficult to estimate. Under the regulation an impervious floor is required and walks and ceilings must be cleaned. This report assumes that the form construction and finishing work will be done by the farmer. The only cost would be the cement, which is currently priced at about $18 per cubic yard. Allowing 90 square feet for each stall with a concrete thickness of 4 inches would result in a cost of $45 per stall. This is used to calculate the total cost for the number of stalls in each of four herd sizes. Obviously, barn remodeling that requires a concrete floor would, in many instances, require new stanchions, livestock watering equipment, and other barn repairs. Thus the remodeling cost of $675, $990, and $1,260 for each situation really represents a bare minimum if barn remodeling is necessary.

Milkhouse equipment depends partly on the size of milking herd. The minimum size bulk tank of 200 gallons is specified for a 10-cow herd, and 250- and 400-gallon tanks for 20- and 30-cow herds, respectively. The other equipment included is a 30-gallon hot water heater, and exhaust fan, work tanks, and a space heater.

The sewage disposal requirement in the recommended standard is that wastes from the house, milkhouse, and toilets shall not contaminate the surface soil, water supply, or be exposed to insects. Thus, a cesspool and septic tank may very well be required. The sewage disposal system cost was based on University of Minnesota estimates. Here again the required capacity of the system is the same for all herd sizes from 20 to 40 cows. Total cost including materials and labor would be $1,750.

If the water supply does not meet standards or tests unsafe, then a new well would be necessary. Under the recommended standard, if the well water does not meet state regulatory authority standards, it may be

Table 6. Capital costs for farm improvements required to meet proposed manufacturing grade milk standards

Facilities required	10-cow herd 15-stanchion barn	20-cow herd 22-stanchion barn	30-cow herd 28-stanchion barn
Milkhouse	$1,705	$1,705	$1,705
Milk equipment	2,165	2,475	3,010
Well	1,125	1,125	1,125
Barn remodeling	675	990	1,260
Sewer	1,750	1,750	1,750
Total	7,420	8,045	8,850
Average per cow	742	402	295

used for up to 10 years if it is tested annually and found safe and sanitary. If a new well is required, cost will vary greatly due to the different depths at which water is found. This assumes that a 60-foot depth would be near the minimum. The cost of the well with pipe, submersible pump, pressure system, wiring, and labor would be about $1,125.

Total capital outlay requirements are listed in table 6 for 10-, 20- and 30-cow herds. The striking feature of these data is that the total capital costs do not differ greatly from a 10-cow herd to a 30-cow herd. For several of the requirements, there are no differences in the outlay. Therefore, on a per cow basis, outlays decline rapidly with increasing herd size, from $742 per cow for 10 cows to $295 per cow for 30 cows.

Annual Costs

The annual costs of meeting increased milk production standards include several items in addition to depreciation on initial capital outlay. Increased insurance rates at 1.36 percent of this original cost were calculated for only the milkhouse and equipment. This is the current average insurance rate on farm buildings and facilities.

Additional repair and maintenance costs were calculated at 1.5 percent of the cost for the milkhouse, well, and sewer. For the milkhouse equipment, a 5 percent rate was used.

The additional tax cost was based on the current property valuation in Minnesota for tax purposes and a 289 mill rate for each dollar of taxable valuation.

An annual interest rate of 8 percent was used, which probably represents the minimum at which money can now be borrowed.

The annual depreciation is the most difficult cost item to estimate. For a large efficient dairy operation, an expected life of 15 years or more is reasonable. Even if the owner would decide to discontinue farming, it is likely that the production unit would have a sales value. For small operations, the value of the production unit and especially the building and equipment is likely to be zero if the farmer decides to quit dairying. A farmer in his fifties may have to consider a planning horizon of 5 to 10 years to recover his investment, with little or no salvage value for his equipment and facilities later. Consequently, we have used two depreciation periods for estimating costs, 5 years and 15 years.

The annual power costs are based on manufacturers' specifications for milkhouse equipment. Since electricity or fuel requirements for the hot water heater in the milkhouse would be offset by a decrease in that requirement in the farmhouse, this assumes there would be no increase in these costs.

The preceding annual costs for each item were used in estimating the additional annual costs for meeting the proposed milk production standards. These data are presented in tables 7 through 9. Because depreciation was calculated for both a 5-year and 15-year depreciation period, two alternative annual cost figures result. The totals are calculated for the four specified cases presented in table 5.

The total annual cost for case I on a 15-year depreciation period ranges from $1,151 for the 10-cow herd to $1,437 for the 30-cow herd. Reduction of the depreciation period to 5 years about doubles the annual cost.

The total annual cost for case II, when no new well is needed, is not greatly different from case I.

Case IV which involves only cooling milk and milk equipment has an annual cost of less than $1,000 for all three herd sizes for the 15-year depreciation period.

Cost per Hundredweight of Milk

The additional cost, per hundredweight of milk, for meeting the proposed standards will depend on the factors considered to this point, plus milk production per cow. Average milk production per milk cow in Minnesota is about 9,700 pounds per year, but there is considerable variation among herds. Average production per cow for some countries is below 7,000 pounds. Some herds, under DHIA report, average per cow production of 17,000 pounds or more per year. Therefore, to estimate the impact of each of the specified changes on production costs per hundredweight of milk, four milk production levels were considered: 8,000; 10,000; 12,000; and 14,000 pounds per cow per year (see tables 10-12).

Additional cost per hundredweight of milk depends on the cost of facilities required to meet the higher milk standards and production level. For the 10-cow herd producing 14,000 pounds of milk per cow, added cost per hundredweight of milk falls from 82 cents when all facilities must be added (case I) to 41 cents when only milk cooling and milk equipment are added (case IV). For 30-cow herds, the costs per hundredweight of milk for case I and case IV are 34 cents and 19 cents, respectively.

Since many of the small 10-cow herds are at 8,000 pounds production per cow, increased cost per hundredweight of milk when all facilities are added (case I) is $1.44 compared to 72 cents when only milk cooling and milk equipment facilities are added (case IV).

If the depreciation period is reduced to 5 years, the impact for small herds is tremendous. Even at the 14,000 pound production level, the increase in cost ranges from 62 cents to $1.53 per hundredweight. At the 8,000-pound production level, the increase ranges from $1.08 to $2.68 per hundredweight.

Implications

The preceding explanation by no means represents all possible cost effects of increased manufacturing grade milk standards. It does present a range of situations which is likely to be found in Minnesota's dairy farm economy. Does this imply that costs will actually be increased by these magnitudes if the regulation is adopted? Faced with some of the cost in-

Table 7. Required investment and annual cost for a 10-cow milking herd to meet recommended production standards

New facilities	Case I	Case II	Case III	Case IV
Milkhouse	Yes	Yes	Yes	No
Barn remodeling	Yes	Yes	No	No
Cooling milk and milk equipment	Yes	Yes	Yes	Yes
Well	Yes	No	No	No
Sewer facilities	Yes	Yes	Yes	No
Total investment	$7,420	$6,295	$5,620	$2,165
Annual cost with 15-year depreciation		dollars		
Depreciation	495	420	375	144
Insurance	53	53	53	29
Repairs and maintenance	177	160	160	108
Taxes	101	101	90	62
Interest	297	252	225	155
Electricity	28	28	28	28
Total	1,151	1,014	931	576
Total per cow	115	101	93	58
Annual cost with 5-year depreciation				
Total	2,140	1,853	1,680	865
Total per cow	214	185	168	87

Table 8. Required investment and annual cost for 20-cow milking herd to meet recommended production standards

New facilities	Case I	Case II	Case III	Case IV
Milkhouse	Yes	Yes	Yes	No
Barn remodeling	Yes	Yes	No	No
Cooling milk and milk equipment	Yes	Yes	Yes	Yes
Well	Yes	No	No	No
Sewage system	Yes	Yes	Yes	No
Total investment	$8,045	$6,920	$5,930	$2,475
Annual cost with 15-year depreciation		dollars		
Depreciation	536	461	395	165
Insurance	57	57	57	57
Repairs and maintenance	193	176	176	149
Taxes	110	110	95	67
Interest	322	277	237	167
Electricity	56	56	56	56
Total	1,274	1,137	1,016	661
Total per cow	64	57	51	33
Annual cost with 5-year depreciation				
Total	2,347	2,060	1,807	991
Total per cow	118	103	90	50

Table 9. Required investment and annual cost for a 20-cow milking herd to meet recommended production standards

New facilities	Case I	Case II	Case III	Case IV
Milkhouse	Yes	Yes	Yes	No
Barn remodeling	Yes	Yes	No	No
Cooling milk and milk equipment	Yes	Yes	Yes	Yes
Well	Yes	No	No	No
Sewage system	Yes	Yes	Yes	No
Total investment	$8,850	$7,745	$6,465	$3,010
Annual cost with 15-year depreciation			dollars	
Depreciation	591	515	431	201
Insurance	64	64	64	64
Repairs and maintenance	219	202	202	176
Taxes	124	124	104	76
Interest	355	310	259	189
Electricity	85	85	85	85
Total	1,437	1,300	1,145	791
Total per cow	48	43	38	26
Annual cost with 5-year depreciation				
Total	2,617	2,330	2,007	1,192
Total per cow	87	78	67	40

Table 10. Estimated increase in cost per hundredweight of milk produced to meet recommended production standards for a 10-cow dairy herd.

	Case I	Case II	Case III	Case IV
	dollars per hundredweight			
15 year depreciation production/cow/year (pounds)				
8,000	1.44	1.27	1.16	0.72
10,000	1.15	1.01	0.93	0.58
12,000	0.96	0.85	0.78	0.48
14,000	0.82	0.72	0.67	0.41
5 year depreciation production/cow/year (pounds)				
8,000	2.68	2.32	2.10	1.08
10,000	2.14	1.85	1.68	0.86
12,000	1.78	1.54	1.40	0.72
14,000	1.63	1.32	1.20	0.62

crease calculated here, it is likely that a number of responses can and would be made. First, a number of producers will not attempt to meet the standard. The model law, as recommended in the proposed standards by the USDA, states that there is a 2-year period before the Act becomes binding—that is, until a plant (in order to sell to the government and to some states) would be required to refuse to accept milk not meeting the standards of the regulation. The USDA-recommended program probably will not become effective until sometime in late 1970 or early 1971. Therefore Minnesota's program to comply with these standards will not be established until after that date. It's likely that whatever regulation is adopted will not be completely binding for at least 3 years.

At some point beyond the 3-year period, dairymen will have to comply with the program. Small dairy operations of 20 cows or less, without other income sources will realistically have two alternatives: (1) to phase out their dairy enterprise, going to other farm enterprises or to quit farming or (2) to increase herd size to cover additional costs of higher standards. Many will make the first choice. This may accelerate the trend that has been occurring for many years. Between 1957 and 1969, farms with fewer than 10 cows decreased by 75 percent (table 13). Those with 10-19 cows decreased by 67 percent. During this 12-year span, those with 20-29 cows decreased about 4 percent.

Those choosing the second alternative, that of expansion, would allow producers to make the change at a lower cost per hundredweight than indicated by data in tables 10, 11, and 12. For example the cost per hundredweight for making all changes is 40 cents and 12,000 pounds per cow herd average production with 30 cows and 96 cents for 10 cows with the same production level. Since there are economies of size associated with producing milk with a large herd, the net increase in cost per hundredweight would be less than 40 cents if a dairyman with 10 cows were to increase his herd to 30. As an example of this, the cost figures were applied to previous research results at the University of Minnesota on economies of size in dairying.[3] This indicated that a farm with 19 cows and selling some corn could make changes required by case I and maintain the same net income level by increasing herd size to 24 cows. A 13 cow-corn farm could slightly increase its net income position while making all changes required in case I by increasing herd size to 19 cows.

Another consequence of adoption of the proposed standards will be an acceleration in the trend to one grade milk. The growth in size of dairy herds changes production methods and tends to raise milk quality.

Many of the techniques of milk production for the very large herds easily meet grade A requirements. Often the only additional requirement for grade A production would be inspection and certification by a grade A authority.

[3] Boyd M. Buxton and Harald R. Jensen, *Economics of Size in Minnesota Dairy Farming*, Agriculture Experiment Station Bulletin 488, University of Minnesota, St. Paul, Minnesota, 1968, p. 11.

Table 11. Estimated increase in costs per hundredweight of milk produced to meet recommended production standards for a 20-cow dairy herd

	Case I	Case II	Case III	Case IV
	dollars per hundredweight			
15 year depreciation				
production/cow/year (pounds)				
8,000	.79	.71	.64	.41
10,000	.64	.57	.51	.33
12,000	.53	.47	.42	.28
14,000	.46	.41	.36	.24
5 year depreciation				
production/cow/year (pounds)				
8,000	1.47	1.29	1.13	.62
10,000	1.17	1.03	.90	.50
12,000	.98	.86	.75	.41
14,000	.84	.74	.65	.35

Table 12. Estimated increase in cost per hundredweight of milk produced to meet recommended production standards for a 30-cow dairy herd

	Case I	Case II	Case III	Case IV
	dollars per hundredweight			
15 year depreciation				
production/cow/year (pounds)				
8,000	.60	.54	.48	.33
10,000	.48	.43	.38	.26
12,000	.40	.36	.32	.22
14,000	.34	.31	.27	.19
5 year depreciation				
production/cow/year (pounds)				
8,000	1.09	.97	.84	.50
10,000	.87	.78	.67	.40
12,000	.73	.65	.56	.33
14,000	.62	.55	.48	.28

Table 13. Farms reporting milk cows and heifers 2 years old and over kept for milk

Year	1-9 cows	10-19 cows	20-29 cows	30-49 cows	50 cows and over	Total herd
1957	41,384	44,327	13,528	3,109	309	102,657
1969	10,145	14,653	12,983	9,558	1,981	49,320
Present change 1957-1969	—75	—67	—4	+207	+541	—52

Source: Minnesota Agricultural Statistics

This report has estimated some of the direct effects of higher milk standards for Minnesota manufacturing milk producers. However, the movement toward one grade milk will be one of the more important indirect effects of higher standards.

The actions of manufacturing grade milk producers to participate in the higher returns of fluid milk markets will push the industry to higher manufacturing milk standards, if not identical standards for fluid use milk. Currently, large quantities of fluid eligible milk are used in manufactured products. Producers of this milk participate in the higher returns through pooling plans of state and federal orders or cooperative standby pools. Additional producers forced to improve standards, are likely to make the shift to fluid eligible milk to participate in these programs.

The potential of increased standards to make the manufacturing milk industry more competitive with the fluid milk industry is evidenced by current developments in the dairy industry. Many manufacturing plants in the Upper Midwest now receive fluid grade milk, most of which is used in manufactured dairy products. But because it is eligible for fluid use, it is sold at the higher price whenever possible. To prevent this manufacturing milk from entering primarily fluid markets and depressing those prices, producer groups in other parts of the country are paying manufacturing plants to keep this milk off the fluid market. It is apparent that milk originating in this area of the country competes in many distant markets. The nearer the manufacturing standards move to fluid grade standards, the greater the possibility that it can meet fluid standards and become a supply source for other areas of the country. Thus, more producers in the manufacturing areas can and will make a claim for participation in the higher returns in fluid milk markets.

Technology itself tends to push toward higher production standards. New techniques of dairy herd operation, when adopted, result in production methods similar to those for fluid grade milk. For example, farm bulk tank and associated equipment would often meet the requirements for fluid grade milk. When the producer has made the shift to this equipment, the price incentive to meet fluid grade requirements may not be very great.

Summary

The USDA and USPHS are currently establishing higher (increased) production standards for manufacturing grade milk. Actual standards will probably become effective in late 1970 or early 1971. Administration of the standards under the program will be left to the states. This program will require standards for animal health, water supply, sewage disposal, milkhouse, cooling and cleaning equipment, and animal housing.

This program's greatest impact in Minnesota will be on milk producers with fewer than 20 cows, who deliver milk to plants in cans. For producers required to make a number of improvements in the milk production facility, costs could increase almost $1.50 per hundredweight for a 10-cow operation. The additional capital outlay for changes in a small operation

could total $7,420. Capital requirements for meeting the standards do not increase in proportion to herd size increase. Therefore, when making any given change, the per hundredweight costs are much less for large than for small dairy herds. For example, a unit with 30 cows producing 10,000 pounds of milk per cow could build and equip a milkhouse, drill a well, put in sewage disposal, and make barn improvements at a cost of 48 cents per hundredweight. For a 10-cow herd, similar changes would increase milk cost $1.15 per hundredweight.

The consequence of the new program will be to accelerate the already declining numbers of small dairy farmers in Minnesota. Others will be forced to increase herd size to maintain acceptable net income levels. In addition, this program will push the industry to one grade milk for all uses.

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