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Economic Considerations in Changing To Grade A Milk Production

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The dairy industry is very competitive because of the large number of producers. Few, if any, producers sell a large enough volume of milk to have a measurable effect on the market place. Dairy farmers are constantly seeking methods and practices that will reduce unit costs and increase net income. As a result, they have become quite efficient.

One way that producers of Grade B or manufacturing milk may increase milk production income is to shift to Grade A milk production. This publication discusses economic factors that individual producers must consider when deciding to change to Grade A production.

The Idaho dairy industry must efficiently produce milk at a relatively low cost if it is to compete with milk and dairy products produced nearer metropolitan markets. A moderate climate and abundant feed supplies together with the production of high quality manufactured dairy products are favorable to the Idaho dairy industry and have kept Idaho competitive.

Idaho markets for fluid milk products are relatively small. The majority of Idaho's milk is manufactured into butter, powdered milk and cheese. These products are made from Grade B milk and from Class III milk produced in federal milk orders. As recently as 1983, 55 percent of the milk produced in Idaho was Grade B or manufacturing milk.¹

Of the Grade A milk produced in the Southwest Idaho-Eastern Oregon Federal Milk Marketing Order, less than 20 percent has been used for fluid products recently. The other four-fifths, consisting of Class II and III milk, is processed mostly into manufactured dairy products. Low Class I usage reduces the blend price to a level only slightly higher than Class III or manufacturing milk. The blend price is a weighted average of all milk marketed under regulation of a milk marketing order.

¹Milk Industry Foundation, Milk Facts, 1984. Washington, DC, July 1984.

Before the 1950s, many farms had a few dairy cows, and milk was usually marketed in 10 gallon cans. Milk processors would pick up milk in almost any volume. At that time, there was a wide difference between requirements for the production of Grade A and Grade B milk. As cans were phased out and bulk tanks were required for all dairy farms, many small producers ceased marketing milk. Most of those who remained in business increased the number of cows and improved their facilities. Grade B standards have been raised so that there is less difference between Grade A and Grade B production requirements than previously.

Cost Considerations In Upgrading Dairy Operations

To produce high quality milk consistently and meet the provisional requirements for shipping Grade A, five components of the dairy operation must be evaluated and, if necessary, upgraded: (1) the bulkroom, (2) milking parlor, (3) cow and barn cleaning, (4) barnyard and loafing area and (5) water system.

The Bulkroom — These facilities are the same for Grade A and manufactured grade production except that Grade A bulkrooms must have a separate handwash facility and a two-compartment wash vat. Double compartment wash vats are commonly found in most barns, so the only cost of converting a manufactured grade bulkroom to Grade A specifications, aside from any costs of cleaning up the bulkroom, could be the installation of the handwash facility.

Milking Parlor — Grade A milking parlors need to be tightly constructed and painted. Open rafters are not allowed, and the walls must be built of concrete or other impervious material and painted to provide for easy cleaning. Most barns are built of concrete block or durable fiberglass walls, so normally the major costs incurred in improving the milking parlor would be from installing a

ceiling and painting the walls. Standing pools of water are not permitted, which may require that concrete be sloped toward drains so that sufficient drainage occurs.

Cow and Barn Cleaning — To qualify for Grade A use, milk must come from cows that are washed with a sanitizing solution before milking. Dairy men can apply sanitizer directly in a diluted water solution by sponge or cloth, or they can incorporate the sanitizer into the wash water with a siphon system or pump. Several sanitizer systems are available, and prices vary according to efficiency and capacity. Less efficient methods of applying sanitizing solution require more labor and are often less effective at cleaning the udder and teats, thus increasing the potential for disease spread.

Much of the additional operating cost after converting from manufactured grade to Grade A production is in providing for clean milk produced under sanitary conditions. These costs result from the use of the sanitizing solution, towels, fly sprays and other cleaning expenses. The monthly cost of these items depends on the amount used by the producer.

Barnyard and Loafing Area — The same cleaning practices should be observed to handle manure and trash in the barnyard and loafing area regardless of grade classification of milk production. However, manufacturing grade producers have been allowed a little more freedom in this area. Investment in manure handling equipment and additional labor may be needed to properly clean the vicinity for Grade A requirements. A requirement in some areas of Idaho is a conditional use permit obtained from the Division of Environment for an approved barn and barnyard waste handling system. Inadequate waste disposal systems may require extensive capital improvements to comply.

Table 1. Milk quality standards.

Quality requirement	Manufactured grade	Grade A
Somatic cell count	No more than 1,000,000 per ml	No more than 1,000,000 per ml
Bacterial estimate		
Standard plate count	Less than 200,000 per ml	Less than 100,000 per ml
DMCC ¹	Less than 1.5 mil. per ml	—
Resazurin reduction	Not less than 4 hours time	—
Sediment disc	Less than 3	No requirement
Antibiotics/inhibitors ²	No detectable zone according to approved methods	No detectable zone according to approved methods
Cooling	Cooled to 40°F or below within 2 hours after milking and maintained below 45°F thereafter	Cooled to 45°F or below within 2 hours after milking and maintained below 50°F thereafter

¹Direct microscopic clump count.

²While the general testing requirements are the same for both grade classifications, no detectable zone is allowed at each level of testing for manufactured grade milk. Marv Patten, Idaho Department of Agriculture, Dairying Division.

Water System — The regulations for structure of a Grade A water system are explicit (see Pasturized Milk Ordinance), and the outlay needed to alter the system to meet these regulations must be carefully considered. If a booster pump is used in the barn, dairy men must install a low pressure cutout switch to avoid negative line pressure and possible water supply contamination. Also, double check valves are necessary for backflush systems. Water tanks in the loafing area are to be filled by top-entry valves. (Bottom-entry valves are not permitted because the water must enter the tank above the water line.) The cost of replumbing tanks so that water enters from the top is relatively little, but top-entry tanks require more maintenance cost.

If the correct facilities, equipment, milking procedures and cleaning practices are used in the dairy operation, then there should be little difficulty passing the tests for Grade A shipping, given disease (i.e. mastitis) problems are not present in the cow herd. Some tests for milk quality are the same for Grade A and manufactured grade producers (Table 1). For example, somatic cell count must be below 1 million for both grade classifications. Other tests such as bacteria count must be less for Grade A milk while still others (i.e. anti-biotic inhibitor and sediment) are stricter for manufactured grade dairy products.

Grade A Price Considerations

The Southwestern Idaho-Eastern Oregon Federal Milk Marketing Order was established July 1, 1981. The uniform blend price since June 1981 for southwestern Idaho is plotted in Fig. 1 along with southeastern Idaho's blend price. Southeastern Idaho's blend price is determined by adjusting the Great Basin blend price for location.

The Great Basin Federal Milk Marketing Order, as with many others, adjusts the price of milk according to the distance from a central market location. Eastern Idaho producers being a considerable distance from Salt Lake City, which is the major Great Basin market, receive a lower price than producers near Salt Lake City. An adjustment is made to offset the cost of moving products from

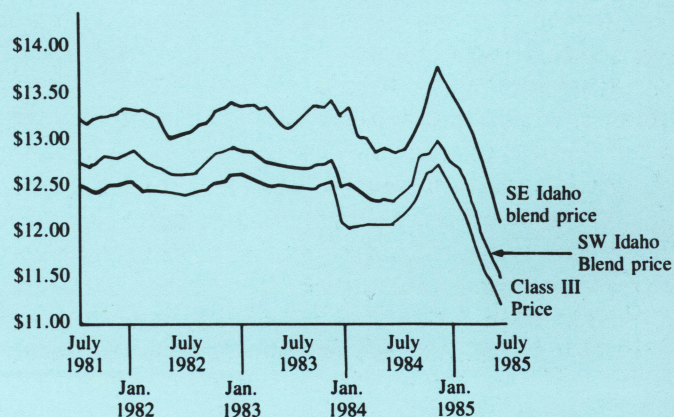


Fig. 1. Federal milk order blend prices for southeastern and southwestern Idaho and the average Class III price, July 1981 to July 1985. (Source: USDA, Federal Milk Marketing Order Statistics.)

one area of the order to another. The location adjustment was 22 cents per hundredweight at Pocatello, 26.5 cents per hundredweight at Blackfoot and 29.5 cents per hundredweight at Idaho Falls. Therefore, the location adjustment for eastern Idaho averaged about 26 cents.²

The Class III price for the Southwestern Idaho-Eastern Oregon and Great Basin zones is also plotted in Fig. 1. The differential between the blend price and Class III price is considerably larger for southeastern Idaho than for southwestern Idaho because of the larger Class I usage in the Great Basin. The Great Basin Class I usage was 39.3 percent in June 1985 compared to 13.5 percent for the Southwest Idaho-Eastern Oregon Order area.

The average blend-Class III price differential for southwestern Idaho since July 1, 1981, was 28 cents per hundredweight. The average differential for southeastern Idaho during this same period was 84 cents per hundredweight. Interestingly, the average differential for southwestern Idaho has increased 1 cent per hundredweight for the period of July 1984 to June 1985, while the average differential for southeastern Idaho has increased 10 cents per hundredweight. Northern Idaho, which is part of the Puget Sound-Inland Empire Federal Milk Marketing Order, had an average blend-Class III differential of about 80 cents per hundredweight for the first 6 months of 1985.³

In June 1985, the blend price in southwestern Idaho was 28 cents per hundredweight more than the Class III price. If a dairy farmer producing in this area can change from manufactured grade to Grade A and produce milk without increasing his cost by more than 28 cents per hundredweight, it would usually be advantageous for him to do so. This is an average figure. Each producer should calculate the difference between blend and manufacturing price based on individual quality, location and hauling costs. This also assumes that it is possible to move into Grade A without cost for quota or entry into the market.

Net Returns from Grade A Conversion

When trying to estimate conversion costs, difficulty arises in determining the amount of labor and materials needed to convert any particular operation to Grade A production. Each dairyman would need to estimate a conversion cost. Little labor and materials would be required to change some barns and dairy facilities that are used to produce manufactured grade milk to Grade A specifications. Most barns are now already constructed to Grade A specifications even though the milk produced in these facilities may be shipped as manufactured grade. Many older manufacturing grade operations would require considerable remodeling costs to meet the requirement of fluid milk production. A visit from a health department inspector before converting can help a producer determine the re-

quired improvements. Costs of conversion can then be more accurately estimated.

To provide a workable example of Grade A conversion, the following assumptions were made:

1. The ceiling in the milk house must be replaced.
2. Walls must be painted in the milk parlor.
3. Handwashing facilities need to be installed for milk hauler and personnel.
4. Alterations to be made in the bulkroom include replacing the current lights with 20 foot-candle lights and painting the walls. (The USDA requires 20 foot-candles of light, but some older facilities may not meet this requirement.)
5. The water troughs must be replumbed so that water enters the tank above the water line.

The costs of the above mentioned conversion requirements are shown in Table 2 along with the costs of other items that are generally not present in a manufactured grade operation. In addition, Table 3 shows the conversion costs of an operation that would require minimal changes. The

Table 2. Grade A conversion cost assumptions for dairy facility requiring sizable improvements, southwestern Idaho.*

Bulkroom conversion	
Double compartment wash vat	\$ 200
Handwashing facilities	100
Conversion costs (lights, inline/outline, etc.)	1,500
Milk barn conversion¹	
Ceiling	1,800
Paint (paint and labor) ²	720
Repairs (filling cracks and seams)	50
Additional equipment	
Sanitizing system	300
Barnyard alterations	
Water tank conversion ³	30
	\$4,700

*Based on an average of cost estimates from a representative number of dairy suppliers and general contractors in southwestern Idaho.

¹Approximately 900 square feet.

²Assuming walls are cinder block.

³For two tanks.

Table 3. Grade A conversion cost assumptions for dairy facility requiring few improvements, southwestern Idaho.*

Bulkroom conversion¹	
Handwashing facilities	\$ 100
Milk barn conversion²	
Paint (paint and labor) ³	1,170
Repairs (filling cracks and seams)	50
Additional equipment	
Sanitizing system	300
Barnyard alterations	
Water tank conversion ⁴	30
	\$1,650

*Based on an average of cost estimates from a representative number of dairy suppliers and general contractors in southwestern Idaho.

¹Assuming double wash vat already exists.

²Assuming good ceiling already exists and approximately 900 square feet of floor space.

³Walls and ceiling (\$720 and \$450, respectively).

⁴For two tanks.

²Information provided by the Great Basin Federal Milk Marketing office in Salt Lake City, July 1985.

³Information provided by USDA Agriculture Marketing Service Dairy Division in Portland, July 1985.

cost estimates in these tables are based on average costs from dairy equipment suppliers and estimates from general contractors in southern Idaho. Actual cost will vary depending on the supplier of equipment or service and the quality of service and equipment demanded.

The average differential return from conversion relevant to the Southwestern Idaho-Eastern Oregon Federal Milk Marketing Order since the zone's establishment is 28 cents per hundredweight. The average production per cow per month for 1981-84 was 1,095 pounds. Applying these data to an 80 cow herd, additional income conversion would be \$245.28 per month. An 80 cow herd was considered since this represents about the average size of herds with 10 or more cows in Idaho. Net returns after costs (conversion, operating and maintenance) are \$46.10 per month or 5 cents per hundredweight (Table 4). This example indicates that despite the added costs of changing to Grade A, the investment is still profitable. If the dairy operation needs fewer changes to meet the approval of Grade A inspections, the additional profit could be as much as \$82.65 per month or 10 cents per hundredweight (Table 5).

Some milk processors offer quality bonuses for exceptionally clean milk. Bonuses are awarded to both Grade A and manufactured grade producers; however, the requirements for quality bonuses in each grade classification may differ. Additional payments for quality milk strengthen the financial incentive for Grade A conversion.

Tax incentives can also make upgrading facilities more profitable. Tax savings accrue for additional depreciation of capital investments. For example, if the dairyman fac-

ing higher cost conversion is in a 40 percent tax bracket, his tax savings would be \$12.73 ($\$30.68 \times .4$) per month or 2 cents per hundredweight. The Accelerated Cost Recovery System (ACRS), which allows greater depreciation write-off in earlier years, would increase returns during the more critical investment period and reduce the cost of capital. Tax savings can be increased the first year by taking the option of expensing part of the recovery property. A 10 percent investment tax credit is allowed on the remaining cost of the qualifying property and directly reduces taxable income.

Inspections

Grade A operations are required to be inspected at least twice a year. The fee for these inspections formerly came directly out of the dairyman's milk check. The inspections are now paid indirectly by the dairyman from a producer's pool to the state health department.

The Idaho Department of Agriculture inspects manufacturing grade facilities. The Department of Agriculture makes less frequent inspections for manufactured grade producers. Inspection costs are also paid by the dairy processor. Because of fewer visits by the inspector and less stringent requirements by the Department of Agriculture, manufactured grade producers may have fewer maintenance costs than Grade A producers.

The standards and rules governing Grade A and manufacturing grade facilities are much the same according to their respective inspection manuals. But, in practice, manufacturing grade producers are allowed considerable latitude in the area of facility requirements and conditions

Table 4. Incremental budget for 80 milk cow herd with higher Grade A conversion costs, southwestern Idaho.

	Per month	Per cow	Per cwt
Additional income: (\$0.28/cwt differential between blend price and Class III price)	\$ 245.28	\$3.07	\$0.28
Fixed costs:			
Depreciation ¹	30.68	0.38	0.04
Interest ²	35.25	0.44	0.04
Total fixed costs	65.93	0.82	0.08
Operating costs: [*]			
Sanitizer	50.00	0.63	0.06
Towels ³	30.00	0.38	0.03
Corral cleaning	32.00	0.40	0.04
Barn cleaning	20.00	0.25	0.02
Total operating costs	132.00	1.66	0.15
Maintenance costs:			
Water tanks	1.25	0.02	—
Total costs	199.18	2.50	0.23
Net return	46.10	0.57	0.05

*Based on an average of costs for a representative sample of dairy producers in southwestern Idaho.

¹Straight-line depreciation. Painting is assumed to have 7-year useful life. All other items are depreciated over 15 years.

²Annual interest rate of 9 percent.

³Assuming towels were not used before.

Table 5. Incremental budget for 80 milk cow herd with lower Grade A conversion costs, southwestern Idaho.

	Per month	Per cow	Per cwt
Additional income: (\$0.28/cwt differential between blend price and Class III price)	\$ 245.28	\$3.07	\$0.28
Fixed costs:			
Depreciation ¹	17.00	0.21	0.02
Interest ²	12.38	0.15	0.01
Total fixed costs	29.38	0.36	0.03
Operating costs: [*]			
Sanitizer	50.00	0.63	0.06
Towels ³	30.00	0.38	0.04
Corral cleaning	32.00	0.40	0.04
Barn cleaning	20.00	0.25	0.02
Total operating costs	132.00	1.66	0.15
Maintenance costs:			
Water tanks	1.25	0.02	—
Total costs	162.63	2.04	0.18
Net return	82.65	1.03	0.10

*Based on an average of costs for a representative sample of dairy producers in southwestern Idaho.

¹Straight-line depreciation. Painting is depreciated over 7-year period. All other items are depreciated over 15 years.

²Annual interest rate of 9 percent.

³Assuming towels were not used before.

as well as milk quality. In some cases, the language used to ensure high quality milk and satisfactory milking facilities in Grade A operations is more specific than language instructing manufacturing grade inspectors.

If a manufacturing grade producer has been just barely passing manufacturing grade requirements, he may find the cost of converting to Grade A quite high. He would probably need to make substantial facility changes and meet requirements for frequent and more thorough inspections.

District health departments cite several possible reasons why manufacturing grade producers choose not to ship Grade A. These are as follows:

1. Cost of upgrading facilities and milking procedures.
2. Fear that inspections may be too demanding.
3. Mastitis or other herd health problems may prevent attainment of acceptable milk.

However, a study of current requirements for Grade A and Grade B production indicate that differences are not large.

Implications of a Single Grade of Milk in Idaho

The purpose of this publication is primarily to discuss items that should be considered by a Grade B dairy farmer when deciding whether to change to Grade A production. Another consideration is the impact that mandatory Grade A production would have on current Grade B producers. Smaller producers would find changing more difficult because the cost of conversion per cow would tend to be higher unless herd expansion were included in the change. If this change were required rather than voluntary, some Grade B producers would convert to Grade A, others would change and increase herd size at the same time, and some would go out of the dairy business either for personal reasons or because the added return would not cover the cost of conversion.

Another implication of mandatory Grade A production would be to increase milk supplies under federal milk orders. This would reduce the blend price and further reduce the price difference between the blend price and Class III milk. Most of Idaho's milk will continue to be manufactured in the foreseeable future rather than being used for fluid consumption whether it is Grade A or Grade B.

While conversion may increase production costs for some, potential increases in net returns from lower hauling charges are possible. Presently, a milk hauler has to make separate trips for manufactured grade milk and Grade A milk even though the milk comes from dairies short distances apart. By increasing the efficiency of plant haulers, transportation savings for all producers could accrue. In addition, the one grade system simplifies plant operations. One grade of milk eliminates the problems of keeping batches of milk separate as well as cleaning costs necessary when plant equipment is used for different grades of milk. Other costs for the milk processor can be reduced

by making more efficient use of trucks, equipment and personnel.

An important advantage to the public of having only Grade A milk is greater assurance that milk is produced under sanitary conditions. Under a one grade system, all milk products would have Grade A quality.

Conclusion

In most instances, net returns for manufactured grade producers with 80 or more cows are expected to increase by converting to Grade A production. Net returns after conversion for dairies with fewer than 80 cows would often be lower because of the high cost per cow. The Idaho Department of Agriculture is pursuing higher standards for manufactured grade producers than in the past. If inspections are more frequent and dairymen improve their facilities to meet these requirements, then manufacturing grade operations would continually become more like those for fluid grade dairies. As these improvements are made by Grade B producers, it will be less costly to change to Grade A. Conversion will then be relatively more profitable. However, as conversion to Grade A continues, the blend price will decrease, offsetting some of the current advantage. If at some future time a single (Grade A) of milk were produced, milk handling could be more efficient since it would no longer be necessary to have separate holding facilities and transportation equipment for two grades of milk.

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