

Dairy Industry Economics—Some Implications for Bovine Practitioners

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Introduction

In 1985 the U.S. dairy industry generated cash receipts of \$18.1 billion. When the receipts associated with the dairy cattle marketed through the beef system are included, the dairy industry generated almost \$26 billion, or about 17 percent of the 1985 total cash receipts of U.S. agriculture. Thus, the dairy industry is a major component of the U.S. farm economy which generates demands for many products and services. The purpose of this paper is to provide the reader with some indication about the current condition of the U.S. dairy and milk markets and to relate those changes to veterinarians practicing in large animal and dairy businesses.

This paper briefly explores four propositions about the nature of the U.S. dairy sector. These include:

- Fundamental market and technological change will continue.
- Government involvement in the dairy industry is assured.
- The direction of government policy will be known shortly.
- The role of the bovine practitioner will change.

Fundamental Change to Continue

Perhaps no story has received as much publicity as the impending technological revolutions facing the dairy industry; especially the predicted consequences of somatotrophin (bGH). In addition, other technologies such as embryo transfer, isoacids, further refined use of DHIA statistics, etc., all point to continued productivity increases within the dairy industry. The full economic ramifications of this emerging technology must be covered in a different paper. The proposition put forth here is that irrespective of final government policy outcomes, fundamental technological and market evolution will continue.

Table 1 illustrates the dramatic change in the productivity and size of the U.S. dairy industry. There has been continuous increases in the productivity of U.S. dairy animals for many years. The production per cow between 1950 and 1985 has increased by more than two and one-half times. The number of dairy cows producing the U.S. milk supply has dropped by more than half. Various authors are estimating what will be the size of the dairy herd and the productivity of that dairy herd in years to come. No one is

certain, but it is conceivable that by the year 2000 (a mere 13 years from now) the U.S. dairy herd may only require seven and one-half million animals to produce all that is needed by U.S. consumers. Nothing in government policy will alter this long historical trend towards increased productivity. In addition, the fundamental changes in population, size, composition, and geographic location will also effect demand for dairy products. Tastes and preferences for products, health concerns, etc., will all provide what economists call macroeconomic forces which will inextricably alter the demand and market for dairy products.

Therefore, the U.S. dairy industry will continue to evolve and change. Attempts to halt either evolutionary changes in demand or in technology will fail. The question then becomes not whether there will be fewer dairy animals and fewer dairy farms in the future, but whether how many fewer firms and where in the U.S. will those firms be located. What influence will government policies have in shaping the answer to these questions? These are the legitimate issues to be debated in ongoing policy debates.

TABLE 1. Dairy Cows and Productivity, 1950-2000.

Year	Number of Dairy Cows (Million)	Average Production Per Cow (Pounds)
1950	23.9	5,314
1960	19.5	7,029
1970	13.8	9,747
1980	10.8	11,889
1985	10.8	13,204
2000	7.5?	18,000?

Government Will Always Be Involved in the Dairy Markets

The Nature of the Product

Government involvement in dairy marketing issues springs directly from the nature of the milk and its associated production technology. Milk is a bulky, perishable, basic food. This has several implications. First, milk must be produced near the markets because of both the perishability and the cost of transport. Therefore, milk marketing is dominated by many sub-national or local markets. These

semiautonomous markets must be linked with a cohesive pricing and regulatory structure so as to prevent marketing chaos.

Second, milk is nature's most perfect food; not only for humans, but for most all bacteria. Therefore, to assure a safe supply of milk extensive health and safety monitoring must be an ongoing part of the marketing system. Veterinarians, of course, are very intricately involved in milk quality and safety regulation and are therefore an important first link in the whole dairy marketing system.

Third, milk has what economists call very inelastic supply and demand curves. Therefore, it is very difficult to balance supply and demand within the dairy industry by using price changes. Very large price changes are needed to move very small surplus quantities of milk. This is the prescription for basic instability within dairy markets. Combine this instability with perishability and a local market structure means that few U.S. agricultural producers are at a worse market bargaining relationship with their principal buyers than are dairy farmers. Over the years, dairy farmers have had to turn to cooperatives to develop the countervailing bargaining power needed to assure their financial survival. Therefore, dairy economics cannot be discussed without understanding the very large, extensive cooperative dairy marketing structure.

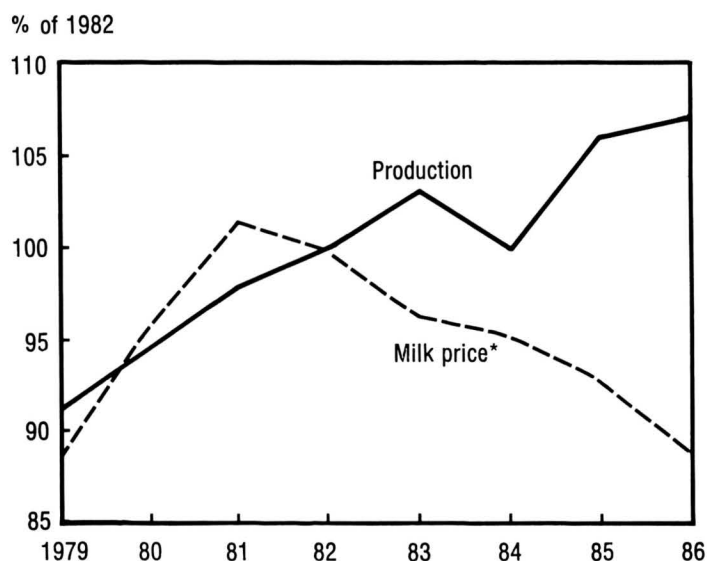
Another basic characteristic of milk is that it is produced in a way that assures a natural intraseasonal surplus. In addition, that surplus must be stored in products that cannot be converted back to fluid demand. Milk production typically is highest during the late spring, early summer months when consumption is lowest. Likewise, production drops in the fall when consumption is at its peak. In order to assure adequate supplies year-round, the dairy industry must carry natural excess capacity. As a result, systems must exist within the dairy marketing industry to handle the surplus milk and convert it into the storable forms of butter-powder and hard cheese.

The result is that every major dairy country in the world generates surplus products. Since most individual country dairy sectors are domestic industries, international trade in dairy products is limited to approximately 5 percent of the world production. Trade becomes dominated by domestically produced surpluses. Therefore, there is no "free" international market for dairy products and nearly all dairy products traded internationally are under some form of explicit or implicit subsidy. If U.S. producers had to sell their milk at currently quoted world prices, they would receive between \$3.60 and \$4.00 per cwt.

The final aspect of milk production involves the nature of its production technology. Dairy production requires a substantial fixed investment in specialized capital assets. Once people have committed to dairying, capital investments have limited value should they leave the industry. Therefore, using pricing policies to lower production becomes very difficult in the dairy industry. Figure 1 is presented to show what has happened in the last few years to

the U.S. dairy industry as government price support cuts have lowered market prices. As you observe in Figure 1, as prices have fallen, production has increased. This is generally regarded as the result of attempts by producers to increase production to keep the cash flowing to their businesses sufficient enough to pay for the substantial investments they have in dairy facilities. Under surplus conditions, the market for surplus dairy facilities is very limited, so many choose to continue to produce rather than leave the business.

FIGURE 1. Milk Price and Production.



* Price received by farmers net of support program deductions.

Types of Government Activity

The result is that dairy markets require and have received three basic forms of government involvement. Governments assure safe milk markets by the use of health and safety regulations. They provide for orderly markets through the use of marketing orders (both federal and state). Finally, government policy provides for fair markets by guaranteeing adequate income through a government operated price support-import restriction policies. Thus, government involvement in dairy economics and marketing involves a three-legged stool of health and safety regulations, marketing order regulations, and price support regulations.

Generally, there has been little concern about the marketing order and the health and safety regulatory aspects of U.S. dairy policy, although some aspects of these will come under scrutiny in the next few years. Therefore, discussions about dairy economics and government policy nearly always are directed toward problems with the income maintenance portion of government policy. In retrospect, it is generally recognized that price supports were pushed

higher than economically justifiable in the late 1970s.

As a result, government involvement and market pricing became tangled. The often quoted Minnesota-Wisconsin (M-W) price is the quoted market price that generates the movement of milk prices in nearly all of the U.S. The government price support program operates to guarantee producers a price and maintains that price through government purchases of butter, powder, and cheese to assure that producer prices do not drop below the support price. Thus, in surplus years the M-W price and the price support become essentially one in the same. Under surplus conditions, government price support determines market prices. This is why impending price support cuts are viewed as price reductions by most dairy industry participants. This will continue so long as surpluses exist. However, when surpluses disappear, the M-W price will be free to move above the government price support. Therefore, market forces would again dominate milk prices throughout the country.

The nature of the dairy industry is that there will always be some form of government involvement. What is really up for question is what form of government involvement will be associated with the goal of maintaining adequate farm incomes. That is the current policy debate and, as stated previously, so long as surpluses continue whatever policy decisions are made will set milk prices throughout the U.S.

The Policy Decision Point is Near

Surpluses in Perspective

The fundamental direction of government policy toward the government price income support should be known within the next few years. The basic debate is centering on whether policies similar to those of the past should be continued or whether policy should move toward a more controlled dairy industry.

Because dairy surpluses have so dominated talk within the dairy industry, the historical perspective of government involvement in price supports is often overlooked. Table 2 shows the net government surplus purchases (which started in 1949) made for recent five-year periods starting in 1971. It was not until the 1981-85 period that surpluses became burdensome. Government price supports worked fairly well for their first 30 years of operation. Since 1981, government surplus purchases have far exceeded those needed for government operations (about 5 billion pounds).

TABLE 2. Net Government Surplus.

Year	Billion Pounds
1971-75	3.6
1976-80	4.2
1981-85	13.2
1986 (Estimate)	10.0
1987 (Estimate)	4.0 to 7.0

Surplus over 5 billion pounds are considered excess.

The support price problem has been recognized, not only by critics of the industry, but the industry themselves. Since 1981, there have been five legislative attempts to deal with dairy policy. The general thrust of these attempts has been to combine price support cuts (thereby holding up market prices) with industry financed voluntary supply control programs.

The Current Situation

The latest dairy policy was contained in the 1985 Food Security Act enacted in December 1985. The provisions of that bill have been fairly well documented. Essentially the 1985 Dairy Bill had another industry funded voluntary supply control measure known as the Dairy Termination Program (DTP). The goal of that program was to purchase out of the industry 12 billion pounds of productive capacity. The second major component of the 1985 Dairy Bill was programmed price support cuts should the Dairy Termination Program fail to bring surplus production down to the manageable levels (less than 5 billion pounds of surplus purchases).

Table 3 shows the price support cuts that are scheduled through the years 1987-1990. Recall that under surplus conditions as the price support declines, the M-W price and the pricing structure for milk in the rest of the U.S. It was hoped that the Dairy Termination Program would reduce production enough so as to avoid these surplus-driven price support cuts in future years. The 1985 law also contains a provision that allows for the Secretary of Agriculture to institute another Dairy Termination Program or Diversion Program during the 1988-1990 period. The current policy situation is clear. If the Dairy Termination Program fails to bring surpluses under control, future price cuts will continue until the point is reached to where enough producers and productive capacity are idled so as to assure the demand and supply reach market equilibrium.

TABLE 3. Policy Price Outlook.

	1987	1988*	1989*	1990*
Potential Support Price —				
Average Test	\$11.29	\$10.60	\$10.10	\$9.60
Potential Support Price —				
3.5% Test**	11.02	10.33	9.83	9.33
Assessments	\$.19	?	?	?

*If on January 1 the Secretary of Agriculture anticipates that CCC purchases will exceed 5 billion pounds in the upcoming year.

**Assumes average test is 3.67 and butterfat differential is 16¢/cwt.

The current status of the dairy markets is encouraging. U.S. production has been dropping for the past several months. September production and October production have been below year ago levels by over 3 percent. It appears that 1986 total U.S. milk production will be 145.3 billion pounds, up only 1.6 billion pounds from the 1985 record total. Had the Dairy Termination Program not been instituted, 1986 production could have been around 149.8

billion pounds. However, there is evidence, especially in some leading dairy states like California, that nonparticipants in the Dairy Termination Program have been increasing their production substantially. When the Dairy Termination Program ends in the fall of 1987 production could again resume its previous expansion trend. Expansion is also being aided by low feed prices and limited income potential in other agricultural enterprises.

The Breaking Point Is Near

A policy decision point is near because evidence suggests that the critical level of milk prices which will force substantial amounts of dairy production capacity out of the industry are rapidly being approached. There is much talk in the countryside and debate in dairy industry circles as to what price level is.

Table 4 presents some evidence from Michigan. In Table 4, five measures of income were specified and price levels were calculated using the assumption that 10 percent of the productive capacity in Michigan would have to be idled in order to develop a balanced national supply-demand situation. The firms represented in Table 4 are a select group of firms voluntarily sending their records to Michigan State University for analysis; and therefore probably represent slightly more prosperous firms than the average dairy farms in Michigan. At the bottom of Table 4 are the projected gross milk prices (those calculated to be comparable to the prices shown in the column in Table 4) that would result from the price support levels being projected by the 1985 bill. The third income measure, enough income from the farm to cover family living and farm cash expenses, but with no principle payments, is probably the best measure to view as a breakeven point. As indicated by those prices, Michigan Telfarm farmers will be at that farm income breakeven price in 1987 and will fall steadily lower in the years 1988-1990.

TABLE 4. Break-Even Price By Income Measure to Cover 90 Percent of the Milk.

272 Dairy Telfarmers, Michigan, 1985

Description of Income Measure	Price Per Cwt. to Cover 90% of Milk		
Farm Cash, No Interest	\$ 9.65		
Farm Cash, With Interest	11.29		
Family Living and Farm Cash	12.28		
Inventory Changes, Family Living, and Farm Cash	12.66		
Depreciation, Inventory Changes, Family Living, and Farm Cash	15.29		
Michigan Prices Under Price Support Cuts			
1987	1988	1989	1990
\$12.27	\$11.58	\$11.08	\$10.55

Source: "Dairy Farm Break-Even Costs in Michigan, 1985," by Sherrill B. Nott and Angela Giglotto, Agricultural Economics Staff Paper No. 86-76, Michigan State University.

Although there is considerable variation among dairy farms represented in the Michigan sample and to the extent that Michigan is representative of the Great Lakes dairy region, Table 4 would imply that the next year or two will be the major decision point for the U.S. dairy industry. If prices continue to fall, substantial numbers of dairy farmers will be in severe financial jeopardy within the next year or two.

The Policy Debate

As a result of this severe financial pressure, the industry continues to explore alternative policy options. A discussion of the basic options is, of course, a topic of considerable length and not discussed here. However, a summary of current thinking on the direction of government policy for dairy income support seems to follow the following five basic choices.

1. Allow the 1985 Food Security Act price support cuts to continue.
2. Allow price supports to continue until 1988 and then institute another Dairy Termination Program.
3. Adopt a full-fledged strict production quota system for the U.S. dairy industry.
4. Develop a target price-deficiency payment system for dairy income support.
5. Develop a two-tier pricing scheme.

The dairy industry is now currently engaged in this debate. No doubt, many of you are actively involved in that debate with your clients and colleagues. As prices fall and the pressure mounts, the debate will pick up intensity. In the opinion of the author, the most likely debate will focus on the first and the fifth policy choices. Some will argue that the evidence is that the equilibrium point in the dairy industry is very close and that a steady hand on the policy tiller will assure success in achieving supply and demand balance. Therefore, allow the price support cuts to continue.

Another group will argue that production increases will continue because of the cash flow bind faced by many producers. Therefore, continued price cuts will only make the surplus situation worse, driving prices lower and creating more financial hardship and stress. This group will argue that a two-tier pricing system which establishes one price for milk that is commercially demanded and a second-tier (substantially lower) price for milk that is produced in excess of commercial demand will be the best way to bring supply and demand under control. Proponents will also argue that a two-tier pricing system avoids many of the negative aspects (especially base values) of a quota system. The dairy industry will need to settle their debate and be prepared to enter it into any major revisions of the general farm legislation that might be considered in the next Congressional session.

The premise of this section has been that within the next two years this fundamental policy choice will be made. But it is again important to remember the first proposition put forth in the paper; i.e., irrespective of the government policy direction chosen, it will merely channel the fundamental

changes and evolution within the dairy industry. Policy changes will not halt or preserve the industry as it currently is.

The Veterinarian's Role Will Change

Irrespective of which policy direction is chosen, there will be intense profit pressures on most dairy farm operators. If the continued price support reduction option is exercised, falling prices will mean the only option for dairy farm managers is to become more efficient and to ruthlessly cut costs. If a supply management option is chosen, intense cost pressures will again arise. By fixing prices and restricting quantities sold, supply management essentially freezes farm revenue. Therefore, the profit maximizing dairy producer's only option for increased profitability is to reduce cost structure.

The challenge to the veterinarian profession is to answer the following question: Do your clients view your services as costs to their operation or services which enhance their revenue and their profitability? If your clients view you as a cost, the intense cost-cutting pressure they feel because of dairy economics will become directly felt in your practices and operations. I would argue that the time is now here for the bovine practitioners to critically evaluate the service mix they are providing to the dairy industry. What kind of new services can you provide to improve the profitability of your clients? For example, herd health programs are oriented toward prevention rather than treatment. Increasingly, producers will be paid by component pricing schemes and on milk quality standards. The price of their milk will be directly related to the state of their herd's health.

In addition, veterinarians can help maximize the use of existing technology. Many producers subscribe to DHIA and record-keeping services, but have insufficient technical knowledge to interpret those data results to improve their

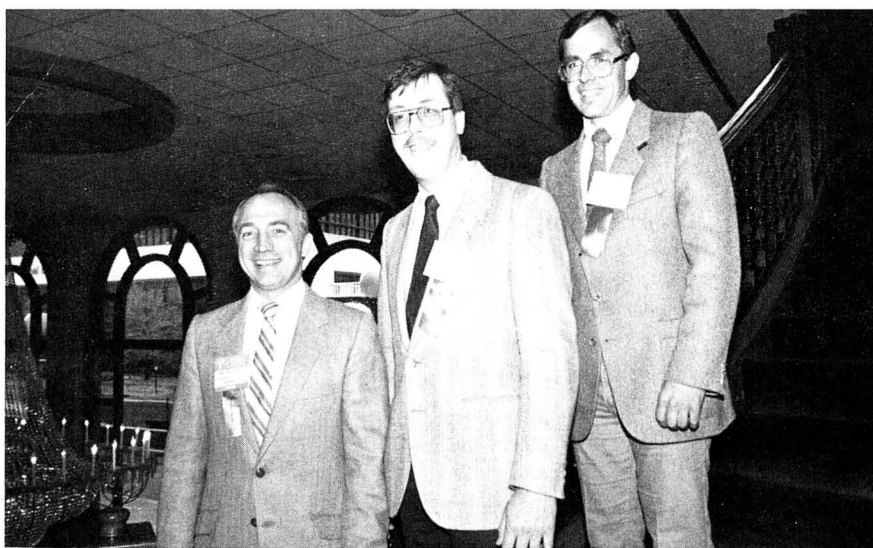
herd health and management. Many dairymen need your technical expertise to help them increase the efficiency of their breeding and reproductive management programs. Increasingly, computer technology could allow data networks to be established directly to your offices so you can develop pre-clinical diagnosis programs by observing daily milk output numbers. Finally, the evolving and new technology enumerated earlier will present the opportunity to the veterinary profession to be the critical teachers and evaluators of the new technology and their proposed applications. Will your profession be leading the dairymen into the wise and profitable use of these new complex technological management developments?

Many accountants have convinced their clients that, "I save you more money than I cost." It could be argued that the bovine practitioner, in order to survive within the evolving dairy economic system, will have no choice but to reorient his/her clients away from viewing veterinarian services as costs and toward them viewing them as profit increasing services. This no doubt will require some fundamental change, not only on many of your parts, but on the part of many dairy producers.

Conclusion

The dairy industry is a vibrant and dynamic industry. Dairy economics has unfortunately for the last few years been dominated entirely by the debate on one aspect of government's involvement in the dairy industry. It does appear that that phase of the dairy industry's history may be approaching an end. Perhaps dairy economics will then be dominated by the emerging technological change so extensively reported in the dairy industry press. Perhaps the only definitive conclusion about dairy economics is that there will continue to be change.

The author would like to acknowledge the valuable contributions to the content of this paper made by Keith E. Sterner, D.V.M., Ionia, Michigan, and Mr. James Lloyd and his colleagues in the Large Animal Clinical Services Department of Michigan State University.



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