



Reducing Seasonality in Dairy Production

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The vast majority of the milk produced in the United States moves through dairy cooperatives. Cooperatives, in conjunction with federal marketing orders, have attempted to implement seasonal pricing plans to minimize the variability of seasonal milk production and provide consumers with a stable and fresh supply of fluid milk and dairy products. However, in spite of these attempts, U.S. dairy marketing cooperatives in general, and Florida cooperatives in particular, continue to struggle with seasonal supply and demand imbalances. This inefficiency is expensive to both the producer and the consumer.

This article presents the dimensions of the seasonality problem, summarizes the performance of a voluntary seasonal pricing plan in Florida, and suggests potential improvements of these plans in the future.

Florida and U.S. Milk Seasonality

Milk production varies throughout the year. In 2002, U.S. monthly milk production exceeded the monthly average (Index = 1.0) for the five-month period of February through June, whereas for the remaining months the monthly milk production was below the monthly average (Figure 1). In general, the opposite is true for consumption. Consequently, national seasonality in both production and consumption continue to result in periods of market imbalance; Florida's seasonality is even greater (Figure 2).

In Florida, moderate temperatures in the spring help to promote monthly production at levels 15% above the monthly average in 1992, whereas summer heat contributes to production levels 17% below the monthly average (Figure 2). At the same

time, the demand for milk varies seasonally, resulting in monthly supply and demand imbalances.

Consequently, Florida dairy cooperatives must export bulk fluid milk early in the year and then import milk a few months or even weeks later. Due to the nature of "full supply" contracts with milk processors, Florida dairy cooperatives incur transportation costs for both the importing and exporting of fluid milk. Other areas of the country tend to experience similar imbalances.

Given the size and type of market, little, if anything, can be done to bring consumption into synch with production. A more likely course of action would be to bring production in line with consumption. The problem of output coordination with the changes in seasonal demand could be dealt with by using production controls (quotas) or with price incentives. Numerous issues, such as implementation and administration as well as the likelihood of capitalization of benefits into the quotas, preclude the use of production controls. Price incentives are more likely to be successful.

In January 1993 the milk marketing cooperatives in Florida implemented a seasonal pricing plan to reduce the variability in seasonal production. The plan provided an incentive for dairy farmers to change their patterns of production so as to produce less milk during the surplus months and more during the deficit months. By achieving this objective, the cost associated with importing and exporting milk would be reduced.

The seasonal pricing plan was in place from January 1993 through December 1995. Due to little influence on seasonality, Florida cooperatives voted to eliminate the seasonal pricing plan after three years. However, upon closer examination,

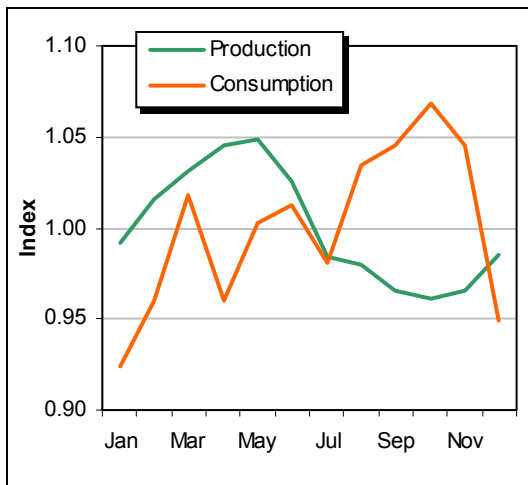


Figure 1. U.S. milk production and consumption seasonality index, 2002.

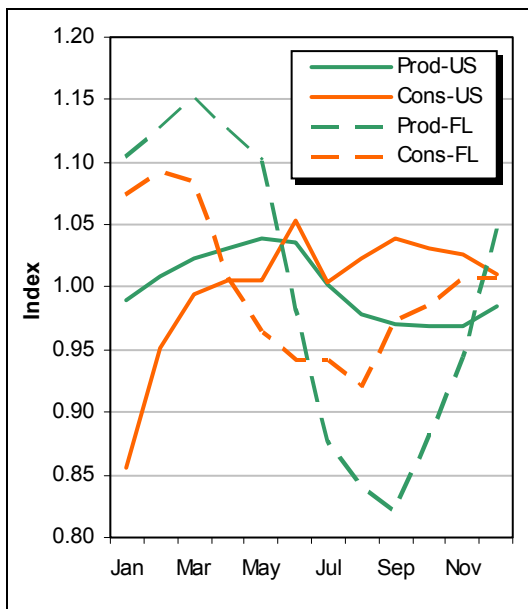


Figure 2. Seasonality of Florida and U.S. milk production and consumption, 1992.

although the plan was not successful, it lacked full participation by the cooperatives' membership.

Cost of Importing and Exporting

In 1992—the year before the pricing plan began—significant amounts of fluid milk moved into and out of Florida. Because of transportation and procurement costs, imported milk costs cooperatives more than milk produced in Florida, whereas exported milk results in a price returned to producers below the price received in Florida. To illustrate, for the five-month July–November period in 1992, Florida cooperatives imported 110.5 million

Table 1. Actual and estimated Florida dairy cooperative milk imports and exports for 1992.

	Actual	Assuming seasonality of pricing plan participating farms
1,000 pounds		
Milk imports	110,518	85,593
Milk exports	122,095	95,392
Dollars		
Cost of imports	20,166,809	15,658,664
Value of exports	11,711,289	9,173,476

pounds of milk at a total cost of \$20.2 million (Table 1) for an average price paid of \$18.25 per hundredweight. For the remaining seven months (January–June and December), Florida cooperatives exported 122.1 million pounds of milk at a return of only \$11.7 million net of transportation costs for an average price received by producers of \$9.59 per hundredweight (Lawson, Kilmer, & Nubern, 1994).

The Pricing Plan and Participation

The seasonal pricing plan was intended to have individual farmers change their production patterns in order to reduce the seasonality and cut the costs associated with imports and exports. Each farm's production in the three highest producing months (March, April, and May) was summed and divided by the total number of days in these three months to give a per day base production. The premium per hundredweight was paid in the lowest production and highest importing months (August, September, and October), when the average daily production in any of these months was greater than 75% of that farm's daily base production in March, April, and May.

Production data from January 1992 through October 1995 was collected from 68 of a possible 307 dairy farmers that belonged to the cooperatives. All farmers included in the data set produced each year from 1992 through 1995 and were Dairy Herd Improvement Associate members. For the three years beginning in 1993, 37%, 40%, and 47% of the 68 farms participated in the pricing plan (Washington, Lawson, & Kilmer, 2000).



Figure 3. Percentage changes in seasonality when compared to 1992 for production in 1993, 1994, and 1995.

The Plan That Failed?

The plan was not effective in reducing the seasonality of production for the 68 farms. In fact, seasonality appeared to increase marginally over the time period of the plan. However, upon closer inspection the *voluntary* nature of the pricing plan likely caused it to fail.

Although the plan was unsuccessful, overall, comparing seasonality on farms that participated in the plan versus nonparticipants shows a different outcome. Results indicate that *participants* in the seasonal pricing plan reduced output seasonality in each year (1993–1995) by as much as 20% (Figure 3; for details see Washington, Lawson, & Kilmer, 2000). In contrast, nonparticipants experienced increases in seasonality each year by as much as 32%.

These results were supported by the farms' actual production (Washington, Kilmer, & Weldon, 2002). Participating and nonparticipating farmers showed no differences in the seasonal use of production practices in 1992. However, a different story emerges after implementation of the seasonal pricing plan. Proportion of cows milking, milk production per cow, calving rates, and other production practices differed in some or all three years. In each case, the seasonal use of the production practices was less seasonal (i.e., smaller) for participating farms compared to non-participating farms. This reduced the degree of seasonality in milk production for participating farms compared to non-participating farms.

Consequently, the seasonality of those that participated in the pricing plan decreased compared to 1992, while the seasonality of those nonparticipating producers clearly worsened (Figure 4). The

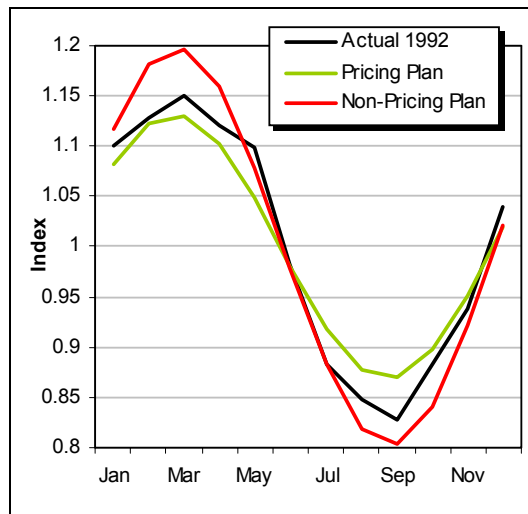


Figure 4. Seasonality of actual production in 1992 and average seasonality of pricing and non-pricing plan participants, 1993-95.

increased seasonality for nonparticipants dampened or overshadowed the pricing plan's effectiveness.

Table 1 indicates the potential benefits under full participation. Using the actual production and consumption data for 1992, but imposing the seasonality index for pricing plan participants from Figure 4, generates the comparisons in Table 1. If in 1992 all the cooperative producers had experienced the average seasonality of participating farms, and assuming prices and consumption were unchanged, imported milk needs would decline by 24.9 million pounds to 85.6 million pounds. The reduced imports would cost \$15.7 million or \$4.5 million less. Similarly, milk exported would have decreased from 122.1 to 95.4 million pounds as production became less seasonal.

Implications for Dairy Policy

Seasonality of milk production remains a problem for Florida and the United States. An effective seasonal pricing plan can provide the incentive for dairy farmers to reduce seasonality in production. Such a plan for cooperatives would require either mandatory participation of all cooperative members or a penalty for excess seasonal variability. This policy would do away with the incentive for non-participants to overproduce in order to make up for reduced production by participants. Seasonal pricing plans can be implemented through the federal marketing order system; however, initiating and implementing a plan would be more timely and

flexible if implemented through milk marketing cooperatives. Milk marketing cooperatives can administer and adapt the plans more quickly than the federal marketing order system.

For More Information

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