Milk prices should respond to strong structural and cyclical pressure and probably return to their long-term average price of about $13.50 per hundredweight for a national all-milk price within five to eight months. For a short period, though, milk prices will likely overshoot the average price, reaching between $14 and $15 per hundredweight. During the interim period, milk prices should start to show marginal improvement.

Milk prices have been well below long-term average prices for more than 11 months.

Milk Price Outlook

by:
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Lower-than-average milk prices, in conjunction with rising feed costs (alfalfa, corn and soybean), create the conditions for large operating losses on a per-hundredweight basis. Many outlooks foresee continued low prices for an extended period. But these outlooks contradict the historical price pattern going back to 1994.

Milk prices have been extremely cyclical since 1994, with every strong peak followed by a crash, and every deep valley followed by a sharp recovery. Forecasting extended low milk prices requires the analysis to point to some factor that has not been present since 1994 now entering the picture. At the moment, several factors might be causing structural change that would allow milk prices to deviate from the historical pattern of the last eight years. These include new trading patterns allowing additional supplies of international dairy products, new government support payments reducing the contraction of smaller suppliers, or possibly even changes in the Western states' expansion rate. These factors will have an impact on the dairy outlook, but none of them are sudden enough to account for the rapid and sharp dip in dairy prices.

Any dairy price analysis should start with an explicit model of supply and demand. It is

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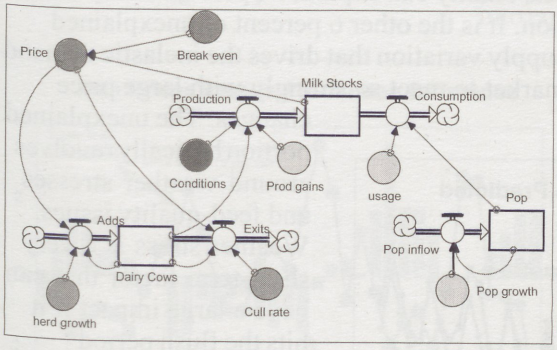
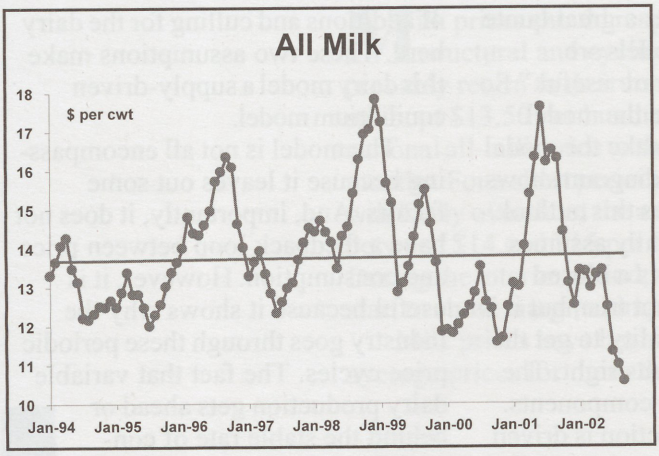
important to remember a great quote about models: "All models are wrong; some models are useful." So the trick is not to make the model "right," but rather to make the model useful. The following diagram shows the model that underlies this outlook.

The model essentially assumes that the United States is a closed dairy market. This is not true, but it is close enough to the reality to get the general price movements right. The model has three major components. First, the rate of production is driven by the dairy herd using long-term trends and current conditions. Second, the balance of supply and demand of dairy products drives price. Finally, consumption is created by population and changes in per-capita consumption. This model also assumes two very important characteristics about the dairy market. First, demand is basically inelastic because there is no feedback between price and usage. This is technically wrong, but no research has shown strong or even moderate short-term price elasticity in milk in the United States. Second, a relationship between current milk price and some break-even price that drives both the rate of additions and culling for the dairy herd. These two assumptions make this dairy model a supply-driven equilibrium model.



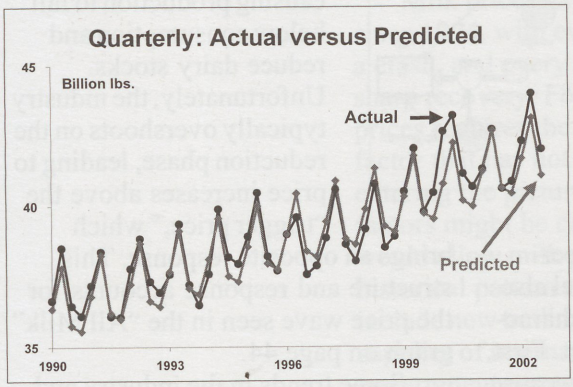
The model is not all encompassing because it leaves out some factors. And, importantly, it does not have a feedback loop between price and consumption. However, it is useful because it shows why the industry goes through these periodic price cycles. The fact that variable dairy production gets ahead or behind the stable rate of consumption causes dairy stocks to rise and fall. The level of dairy stocks triggers a price reaction. When the current price is below the "trigger price," producers slow the rate of additions and increase the rate of culls. That response decreases the herd size and then lowers the rate of production, eventually causing production to fall below consumption and reduce dairy stocks. Unfortunately, the industry typically overshoots on the reduction phase, leading to price increases above the "trigger price," which brings an opposite response. This structure and response accounts for the price wave seen in the "All Milk" graph on page 44.

Some trends in the industry and the model are predictable. Changes in the dairy herd and per cow milk production have had very stable trends during that last decade. The relative rates of changes in year-to-year terms are small and stable. For example, the dairy herd has contracted by approximately 1 percent



per year, and the output per cow has grown at 2 percent per year. These two factors combine to increase the domestic dairy supply at a rate approximately equal to the growth in demand.

These rates of change do vary from year to year, leading to temporary over or under supplies in the market and big swings in milk prices. However, the relative structure of the dairy market is very stable and predictable. Looking at quarterly milk production since 1990, a simple regression of trend and seasonality can explain 94 percent of all variation. It is the other 6 percent of unexplained supply variation that drives the inelastic demand market to react so strongly with large price changes. The unexplained portion basically revolves around weather stresses and feed-quality issues. Weather stress is a very short-term factor that can have a large impact if it hits the flush period (March through July), and feed quality issues seldom extend for more than three or four quarters.

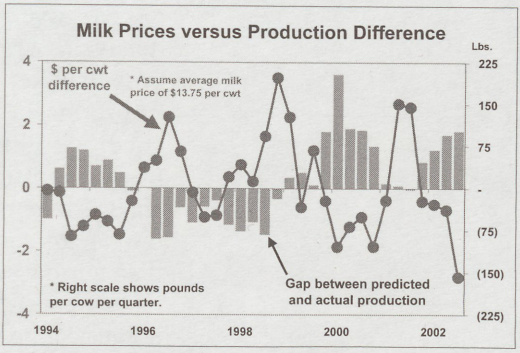


The longest sustained periods of substantial above average milk production are between five and six quarters. The current period of above-average production already extends four quarters. Historically, this would point to an end within one to two quarters if historical patterns persist.

However, more than just timing issues would reinforce the view that prices will see a

strong recovery in the next five to eight months. The current drought has reduced both forage availability and quality in many parts of the country. Additionally, the milk-feed price ratio has dropped to levels not seen since 1997. The milk-feed price ratio is basically the difference between price and the "trigger price" in the model. The combination of falling milk prices and the rally in feed costs have moved the ratio significantly downward, which will soon trigger the feedback of reduced growth in dairy production.

It is likely that production-reducing actions taken during the last two quarters already are working their way through the production system at this time. And, the consequences will be a significant slowdown in the rate of production growth via herd size and production gains. It is important to remember that this outlook never calls for a significant reduction in production. It simply predicts that the rate of consumption growth will need to get ahead of production growth for an extended period to put the market back into equilibrium.



Conclusion

Current and past dairy prices already have triggered a supply growth adjustment that will probably put milk supply and demand back into equilibrium within the next five to eight months. This equilibrium will lead to national all-milk prices to return to its long-term trend of $13.75 per hundredweight, and it is likely the industry will see a brief period where the price overshoots the equilibrium. This view is based on the structural arrangement of the dairy industry and historical price patterns during the last decade.

There are several risks that could push this price recovery out for an extended time. First, structural changes in import policies and/or additional government support payments could increase supply growth, temporarily putting off a

Milk Prices versus Production Difference
Lbs.
$ per cwt difference
* Assume average milk price of $13.75 per cwt
* Right scale shows pounds per cow per quarter.
Gap between predicted and actual production
4
2
0
-2
-4
225
150
75
-
(75)
(150)
(225)
1994
1996
1998
2000
2002

price recovery. Second, the industry could receive a period of above-average production growth in key producing regions, such as California and Wisconsin from very favorable conditions. Finally, some type of demand shock from a significant economic slowdown or change in per-capita consumption could weaken the rate of consumption making even slower than normal supply growth insufficient to restore equilibrium. It is difficult to assign a numerical probability to these types of risks and others, but given the observed occurrence of these types of events, the probability is very low.

The probability of a strong price recovery would appear to be much more likely than a continuation of very low current prices. An outlook with extended low prices requires more unusual events to occur than an outlook with recovering prices. Unfortunately, a price outlook is a calculated risk where the degree of precision is typically overstated. However, betting against well-established price patterns appears to be one of the poorer choices in terms of risk and reward. We believe the dairy industry will stay in the current boom and bust mode of prices. **jal**