

rethinking Dairyland

Background for Decisions about Wisconsin's Dairy Industry

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IS WISCONSIN MILK WORTH MORE?

Wisconsin cheesemakers outpay their western competitors to buy milk. Do they get more for the money?

You might think Wisconsin was sitting pretty. It's the top cheese-producing state and cheese consumption is booming. Cheese sales rose 40 percent in the last decade. More U.S. milk now goes into cheese than into bottles and cartons.

The problem is that Wisconsin milk production fell over the same period. When cheese demand grows and milk production doesn't, cheese plants find it harder to buy enough milk to fill orders and to operate at peak efficiency. Wisconsin cheese plants must compete aggressively with each other, paying top dollar to get enough milk. This helps dairy farmers in the short run, but could hurt in the long run if cheesemakers are forced to close or move to regions where milk is more plentiful and less costly.

Is Wisconsin milk too costly for the state's cheese makers to compete in national markets? We address that question here in a two-step process. First we compare what cheese makers pay for milk in Wisconsin, California (the number-two cheese-producing state) and Idaho (the state with the fastest-growing cheese industry). We then try to see if any unique characteristics of Wisconsin's milk or marketing climate offset a higher Wisconsin price.

Comparing mailbox prices

There's no practical way to compare what cheesemakers in different regions actually pay for milk. No central agency tracks this figure. It's easy to learn the minimum that cheese plants are required to pay, but many plants — including all of Wisconsin's — pay above the minimum. Adding to the difficulty, there are regional differences in how much cheese plants subsidize the cost of hauling milk from the farm.

But we can get an idea of how much more or less Wisconsin cheese makers pay compared to those in the other

regions. We do that by comparing "mailbox" prices paid to farmers. USDA's Agricultural Marketing Service tracks mailbox prices.

As the name suggests, a mailbox price is what a farmer is actually paid for a hundred pounds of milk after all premiums (incentive payments) have been added and hauling and other deductions subtracted. It's not a perfect measure. For one thing, it doesn't account for patronage refunds paid by cooperatives.

Mailbox prices aren't what it costs most cheesemakers for milk. Dairy plants regulated under federal milk orders pay farmers, at a minimum, a weighted average value of all milk marketed in their order (see below). That includes milk sold to bottlers and manufacturers of "soft" manufactured products (e.g., yogurt), which brings a higher price than milk used for cheese.

But Wisconsin, California and Idaho have similar milk use patterns — the three regions have similar percentages of milk going into bottles and manufactured products. So the extra federal order money from milk used in higher-valued products is roughly the same in each market.

Wisconsin prices were usually higher

During a 60-month period beginning in 1995, California mailbox prices averaged \$0.90 per hundredweight lower than those in the Chicago order. California's prices were above Chicago order prices for only nine months during 1998 and 1999 when cheese and milk prices were extremely volatile.

During the same 60-month period, Chicago order mailbox prices were always above S.W. Idaho-E.-Oregon prices. The average difference was \$1.23 per hundredweight.

In January 2000, changes were made in the federal milk

This is part of a series of brief reports on the current state of the Wisconsin dairy industry and factors that will influence its evolution. Expanded versions of these reports, with additional data and graphics, are posted online at <http://www.aae.wisc.edu/www/pub/>

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order system. Orders were consolidated, reducing the number from 31 to 11. Wisconsin was put in the new Upper Midwest order; Idaho went into the new Western order. Mailbox price reporting was expanded to include some individual states. Under the new rules the Class I “price mover” became the “higher of” an advanced Class III or Class IV price. (The price mover drives the Class I price. When it rises or falls, Class I prices rise or fall by the same amount.) Component pricing formulas for Class III and Class IV prices were adopted that closely resembled formulas used to derive California’s 4a and 4b prices.

The federal order reform changed mailbox price relationships somewhat. For five months in 2000, California’s mailbox price was above Wisconsin’s.

During that year cheese prices were severely depressed relative to butter and nonfat dry milk prices. Since a larger share of California milk goes into nonfat dry milk and butter, this made California milk more valuable. Since then, the spread between Wisconsin and California mailbox prices has been growing. All told, from January 2000 on, California mailbox prices averaged \$0.55 per hundredweight under Wisconsin’s.

Order changes in 2000 did not alter price relationships between Wisconsin and Idaho, since milk from the two states goes into a very similar product mix. Idaho mailbox prices remained below Wisconsin’s from January 2000 through May 2002. The average difference was \$1.09 per hundredweight.

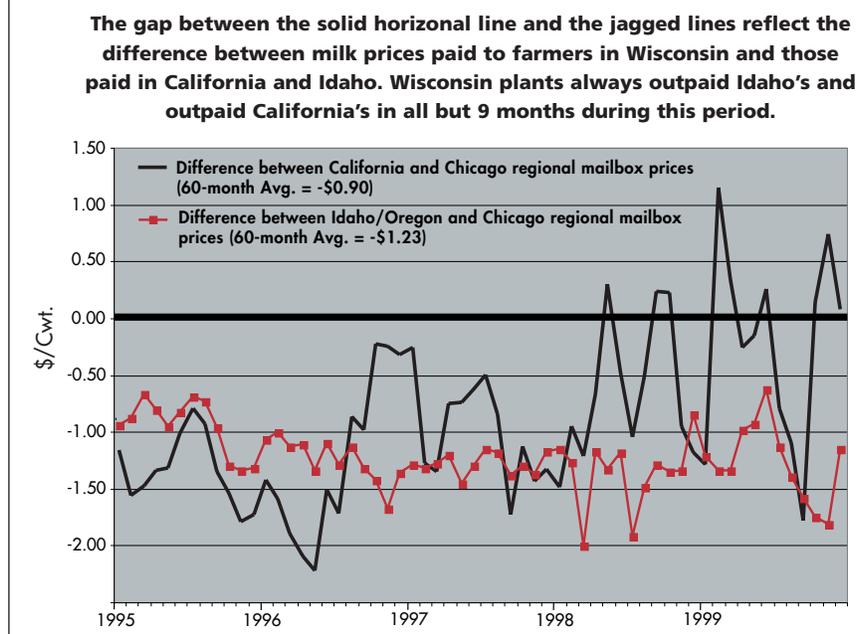
Why do Wisconsin cheese plants pay more? Do they enjoy unique operating advantages that enable them to do so? Let’s examine some possible advantages.

Do reputation and variety count?

Wisconsin has long been known as the cheese state, so cheese with a Wisconsin label could bring a higher retail price. But this advantage has diminished. Only 40 percent of U.S. cheese sells in the retail market, while 60 percent is used in foodservice or food processing. Food services and food processors use mostly commodity cheeses — Cheddar and mozzarella. They demand reliable quantities of high-quality, competitively priced cheeses made to exact specifications. Wisconsin is no longer the chief supplier of such cheeses.

Wisconsin makes more cheese varieties than any other state. The state’s specialty cheese business is booming. Specialty cheese plants can sell in higher-valued markets. This helps them pay top dollar to milk producers. But it’s unlikely that specialty cheese makers will ever absorb more

THE MILK PRICE GAP — 1995-2000



than 5-7 billion pounds of Wisconsin milk (roughly one-fourth of current production).

Most of Wisconsin’s future production will likely consist of commodity cheeses. To remain a reliable supplier of quality cheese in quantities demanded by commercial users, the state will have to increase its milk supply in order to expand cheese production.

Does Wisconsin milk yield more cheese?

A pound of Wisconsin’s milk would be worth more than a pound of Western milk if it yielded more cheese. Cheese yields are affected by milk’s composition (principally butterfat and protein) and quality (measured by somatic cell count).

The West has the edge in protein content, according to 2001 federal market order data. Idaho averaged 3.06 percent. California averaged 3.08 percent. The Upper Midwest averaged 3.02 percent, exactly the average for all orders.

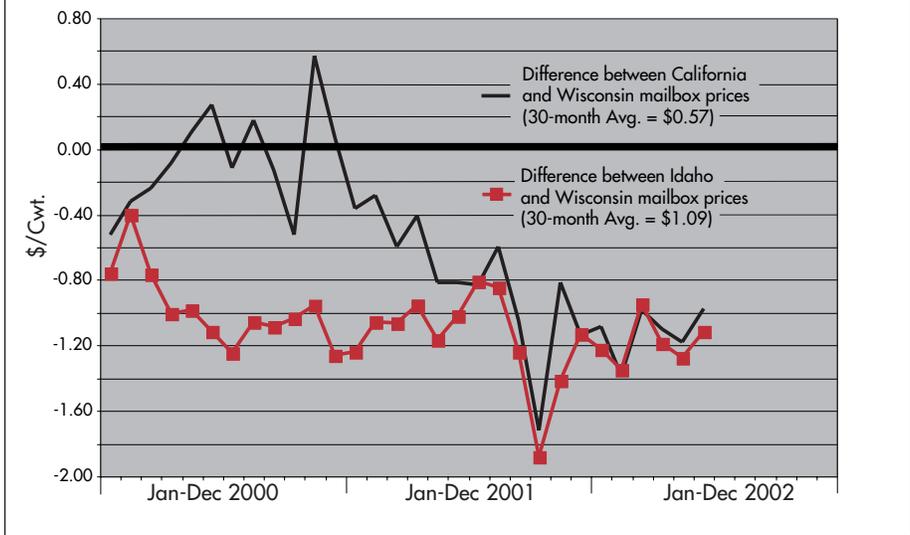
The Upper Midwest was stronger in butterfat, averaging 3.72 percent, compared to 3.61 percent for the Western order, and 3.65 percent for California.

Milk quality is similar. Average somatic cell count was 344,000 for the Upper Midwest order versus 350,000 for all orders that measured somatic cell count.

Looking only at raw milk composition, Wisconsin has a slight advantage in cheese yields over Idaho and California. Using the Van Slyke cheese yield formula for cheddar cheese with varying moisture content, Wisconsin milk’s relatively high butterfat more than makes up for its lower protein. Wisconsin milk will make .03 more pounds of Cheddar per hundredweight than will California milk and 0.12 pounds more than Idaho milk.

THE MILK PRICE GAP — 2000-2002

The regional differences in milk prices eased slightly after order reform in 2000. Still, Wisconsin milk plants continued to outpace Idaho's and outpaid California's in all but 5 months.



Are Wisconsin plants cheaper to run?

Wisconsin plants probably have lower average investment costs per unit of milk received or product sold, because no major new cheese plants have been built in the state since about 1986. In contrast, many plants have invested in modern processing and packaging technologies that reduce variable operating costs. In the short run, plants with depreciated facilities could have relatively low processing costs. But in the long run, Wisconsin will have to invest in new plants to capture economies to scale and remain competitive.

Wisconsin cheese plants may pay less for energy, utilities and labor. A 1991 study found that Wisconsin enjoyed about a \$2-per-hour advantage over California in labor costs. California

The ideal casein-to-fat ratio for high-quality cheddar cheese is about 0.70. Average Wisconsin milk is borderline low (0.67). These means cheese makers must “standardize” milk — remove fat or add protein — to maximize cheese yield. At present, supplemental protein is inexpensive and plentiful, because the dairy price support program encourages overproduction of nonfat dry milk. But that will change. Western milk handlers are shifting production from nonfat dry milk to cheese. When the Western cheese expansion comes on line, cheap out-of-state protein may no longer be available to Wisconsin cheese plants.

Are byproducts worth more?

Cheese plant revenues can be enhanced by the value of their by-products, mainly whey proteins and lactose. Larger Wisconsin cheese plants typically process all of their whey. Smaller plants usually sell whey to larger cheese plants or specialized whey processors. A few dispose of their whey by land spreading.

Less is known about whey processing out west. Comparing relative market shares of cheese production to corresponding shares of dry whey production indicates that Wisconsin cheese plants process more of their whey than do California plants. But California turns more whey into higher-valued forms. In 2000, California made 29.7 percent of all whey protein concentrates. Wisconsin made 17.2 percent.

So Wisconsin processes more of its whey, but makes it into lower-valued products. Western plants process less of their whey, but make higher-value products. So it is doubtful that whey products bring more revenue to Wisconsin cheese plants than to western competitors.

electricity rates were about 70 percent higher, while natural gas rates were 50 percent higher. Water costs were comparable, but California paid more for sewage.

Size matters in running a cheese plant. The 1991 study found that plants that could handle 1 million pounds of milk daily could operate for \$1 per hundredweight (or 10 cents per pound of cheese) less than plants limited to 500,000 pounds. Western plants are, on average, significantly larger than Wisconsin plants. The higher cost of operating smaller plants may offset lower labor and utility costs.

More milk sold for beverage use?

Two things determine how much money is available to pay dairy producers in a given marketing order: Class prices and utilization. The larger the share of the milk in an order that goes for fluid use (Class 1) and the higher the Class I price, the more money available to pay farmers.

Every farmer in an order benefits from all Class I milk sales in that order, even if the farmer’s own milk is used exclusively for making cheese. Revenues from all sales in the order are pooled and distributed so that each farmer’s check is based on an order-wide weighted-average price.

Regulated cheese plants receive a payment from the pool for the difference between the market-wide average value of milk (uniform price) and the Class III value. Therefore, if Wisconsin sold a larger share of its milk for fluid use and had higher fluid milk prices than did competing states, Wisconsin cheese plants could afford to pay a higher price for milk. But in fact, this isn’t the case. Under the federal order system, differences in Class I price are determined by Class I differentials — price add-ons specified for each county in the nation.

In the Upper Midwest, Class I differentials range from \$1.60 per hundredweight in northern Minnesota to \$1.80 per hundredweight near Chicago. In the Western order, differentials range from \$1.60 per hundredweight in most of Idaho to \$1.90 per hundredweight in Utah. So Idaho has a slightly higher Class I price in principal consumption areas. Roughly the same share of milk goes for fluid use in Idaho as in Wisconsin.

Since 1986, the California Class 1 price has averaged 22 cents per hundredweight higher than the federal order Class I price applicable to Wisconsin. Both states sell a similar percentage of milk for fluid milk use.

The upshot is that Class I prices are slightly higher in both California and Idaho than in Wisconsin, and the percentage of milk sold as Class I is about the same in the three regions. Therefore, neither higher fluid milk prices nor higher fluid milk utilization support the higher prices paid to farmers who supply Wisconsin cheese plants.

Do premiums allow plants to pay more?

Over-order premiums are payments for milk above minimum federal order prices. The premiums are negotiated between a group of dairy cooperatives (representing farmer members) and milk buyers. Premiums are paid mostly for Class I milk.

Upper Midwest cooperatives have negotiated some substantial over-order premiums. From 1998 through 2001, Class I premiums added an average of \$1.75 to \$1.88 per hundredweight for Class I milk marketed in Chicago and \$0.89 to \$1.33 per hundredweight for milk sold in Minneapolis. In the western order (Salt Lake City), premiums averaged less than \$0.30 per hundredweight over this period. In California, negotiated premiums above the state order prices are rare.

Over-order premiums benefit dairy farmers affiliated with participating cooperatives, but they may harm nonparticipating cheese plants. Such plants must pay comparable milk prices to get the milk they need, but they do not have access to the cooperatives' over-order premium revenue.¹

It is not clear how much over-order premiums enhance the pay price of Wisconsin cooperatives. Less than 20 percent of Wisconsin's milk goes into bottles. Many cooperatives don't belong to the premium-bargaining federations. And much of the premium goes to offset costs associated with providing milk to fluid plants (especially the cost of operating at varying levels of capacity to accommodate variable bottling schedules). Participating cooperatives probably don't derive more than a few cents per hundredweight. When all is said

and done, over-order premiums do not significantly affect the competitiveness of Wisconsin cheese plants.

Matching milk value to milk prices

Wisconsin cheese plants pay more than their western competitors for Grade A milk, and neither higher revenues nor lower operating costs appear to fully offset the higher prices.

Wisconsin cheese plants have obtained some premiums that reflect their long-standing reputation as a reliable supplier of high quality cheese. But the premiums have diminished as more Wisconsin's cheese is marketed in bulk to food services suppliers and food processors. An exception is the state's growing specialty cheese sector, which serves higher-valued markets and thus supports higher producer milk prices.

Wisconsin milk yields about the same amount of cheese as Western milk. Wisconsin milk is higher in butterfat but lower in protein than Western milk. So far, Wisconsin cheese makers have been able to buy inexpensive surplus nonfat dry milk to balance low protein with high butterfat.

In the long run, Wisconsin farmers can benefit from more closely matching their milk's composition and quality to what cheese makers need. Milk composition affects cheese yield and therefore cheese making costs. Tailoring milk composition and quality will add value to producers' milk.

Wisconsin cheese makers may currently enjoy competitive operating costs because their plant investments are largely depreciated and they pay less for energy and labor. But they'll have to invest in their plants to gain the efficiencies of large, modern Western plants.

Wisconsin has no advantage over western states in terms of Class I use and Class I prices — the share of Wisconsin milk going for bottling is about the same as out west and fluid milk prices are slightly lower. Class I over-order premiums in the Upper Midwest may help some cooperatives to pay more for milk. But Wisconsin plants that do not have access to over-order premium revenue must dig into their own pockets to match the pay prices of those that do.

Dairy producers benefit in the short run from Wisconsin's competitive pay prices. However, the long-term financial sustainability of dairy producers and that of the cheese industry go hand in hand. Wisconsin's cheese makers can't afford to pay more than milk is worth. If they are going to pay more for milk, then that milk must have more value. ■

¹ Dairy cooperatives that pool some of their producers' milk outside their federal order area and thereby benefit from higher uniform prices in other orders have an advantage similar to cooperatives receiving over-order payments. This strategy also creates problems for competitors who are unable to pool. Recent administrative decisions restricting outside order pooling make this a moot issue.

This factsheet is based on Marketing and Policy Briefing Paper 78D. To obtain a copy see page 1. This factsheet was written by agricultural economists Robert Cropp and Edward Jesse. Contact Cropp at (608) 262-9843 or cropp@aae.wisc.edu. Contact Jesse at (608) 262-6348 or evjesse@facstaff.wisc.edu.