

Global Dynamics of the Dairy Business

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The U.S. dairy landscape is swiftly changing

Our industry is not static and may be changing faster than we've seen before. Change is a constant, but the pace of change may be what's different.

THE dairy industry is no longer in the middle of a longer-term, straight-line trend that would make it easier to forecast the landscape in 10 to 20 years. In fact, we may be in the midst of important turning points where new paradigms have emerged:

1. Milk production growth has stopped moving west and has returned to the traditional regions of the Northeast and Upper Midwest. Also, we are seeing new growth in the Southwest and North Central states.
2. Given the shifting location of milk production, processing capacity is inadequate in some regions and in excess in others. Modern manufacturing plants can cost anywhere between \$250 million to \$500 million, so processing capacity does not shift quickly, but premiums paid for milk do.
3. Better genetics and cow care provide plenty of headroom to continue pushing for greater milk yields per cow. But will the trend persist at the same pace? Focus is shifting from maximum milk per cow to maximum feed conversion per unit of milk . . . and those are quite different goals.
4. We have often heard the platitude tossed about that "bigger is better." I don't believe that for a minute, but I do think that "better is better." In other words, the economies of scale are not large enough to justify the growth of very large farms, but folks who are better at managing cows, people, and finances have the incentive and wherewithal to become bigger, and yes, they do capture economies of scale along the way.

The last Ag Census revealed that more than 53 percent of U.S. milk production took place on less than 3 percent of the largest farms. When the 2017 Census is published, I'll wager that this trend hasn't stagnated.

5. Over time, we can see stress fractures in our system of milk price regulation. The dairy industry has become quite complex as milk is separated into many more fractions than simply skim and cream, and the mix of dairy product consumption is very different than it was in the heyday of regulation.

In the 1950s, Class I receipts represented about 65 percent of federal order milk. And, a \$2 Class I differential on top of a \$5 Basic Formula Price represented a significant contribution to a producer's milk check.

However, a \$2 differential on a \$15 Class I Price Mover has a considerably diminished impact. It is further reduced as fluid consumption has declined to about 32 percent of producer receipts in federal orders. The bottom line is that there is less of a prize to fight over for regulatory changes.

6. The U.S. is still relatively new to export sales — about 10 to 12 years of experience. While we have made tremendous strides in better understanding the differences between our overseas customers and our domestic ones, we probably still have much to learn before we become the consistent supplier that we are told is the hallmark of success. And, in our opinion, we haven't yet fully determined what our role should be in the world market. That includes what products and countries in which to focus.

7. How much can we afford to invest of our time, energy, and finances in export sales when agricultural exports could be sacrificed on the altar of trade wars? Contrary to the sagacity of today's current tweets, trade wars are not easy to win, and it's more likely that there will only be losers.

8. Despite the turbulence of an industry in the midst of substantial changes, American consumers will always find a great variety of high-quality dairy products at very affordable prices.

Regulation and Price Discovery

Now that I've thrown several observations on the table, let us try to weave them into a few consistent observations about what the dairy future might be.

Federal and state milk marketing orders provide invaluable services for the dairy industry. Milk testing, audited reporting, product grading, and other basic services will have to be provided by someone, and the neutral third party of milk orders probably makes the most sense. However, we're not at all sure that orders will be in the business of determining minimum prices in the long term.

Classified pricing and pooling have been tools that have served the industry well for more than 60 years, but that basic model has seen difficulty in recent years. If we lose regulated pricing, it won't be the end of the dairy industry, but the environment will be different.

Our crystal ball would say that farms and plants will run toward one another to secure a marketing relationship. That relationship will be codified by a contract that will describe the basic conditions of price but also the quantity that can be marketed over a period of time. In effect, you will have a version of supply management that will help to stabilize price variation. However, it will also place limits on growth. Manufacturers do not want to produce more product than they need for the pipeline stocks and for the sales they expect to have.

Contracting may also change the basic nature of plants. Today, milk components move freely in the form of tanker loads of cream or skim products to plants that can use them. A plant may feel that it should process product lines that will use all of the components they have under contract.

This pushes the balancing of components and seasonal production back to the contracting plant and away from more specialized plants as we do in our current system. This would be a fundamental change in the dairy supply chain.

More consolidation to come

Contracting with individual plants will continue to promote the consolidation of the industry. Farms shipping multiple tanker loads of milk to the same plant each day will simplify market chain coordination and be favored in that environment. These farms will also be able to produce and deliver the volume of milk and components that better match the needs of their contracted plant.

The logistics of distribution will probably mean that plants and farms will be located where it is most desirable to produce milk. Finished products, even fluid milk, will move longer distances to customers than raw milk will move to assembly plants.

As we continue to pursue the genetics and higher milk yields, cooler climates will favor cow comfort. This suggests continued growth in Northern tier states. But some traditional states, like Wisconsin and New York, already have a density of cows and pattern of land ownership that will make new investment in large farms more difficult. Look for regions where land resources would support a significant new investment in production. This could be plants with a milk intake of 8 million to 10 million pounds per day and 20 to 30 large farms supplying it.

Domestic or exports

It is not hard to imagine that plants will further specialize in supplying either a domestic market or an export market. The logistics of distribution can be very different for these two types of customers, and the product characteristics may also be quite different.

For example, it is difficult to seasonally produce butter of 80 percent butterfat in 1-pound packages for a domestic market or 82 percent in kilogram packages for an export market without having a good idea about potential sales ahead of time.

A plant that is focused on developing and servicing an export market would only produce the 82 percent butterfat product. A similar story is true for cheese. A plant with a focus on export customers will work hard to develop long-term relationships and more steady sales, which will also help to bring stability to milk prices at the farm.

It's already happening

In many ways, we have already begun moving down the path of milk production relocation, consolidation of farms, and increasing export expertise. Many of these factors, and others, can be reasons that attract foreign investment in new or existing U.S. processing facilities. These firms bring capital and capacity to our industry, but they also bring export knowledge and different ideas about regulated pricing. We will delve deeper into these issues as we move along.

U.S. dairy processing has gone global

Just 20 years ago, America's top 10 dairy processors were entirely U.S.-based organizations. Now, it's a 50-50 split between domestic and foreign entities.

WHEN it comes to dairy processing, America's dairy plants have evolved considerably over the past two decades. Since the sector's inception with a tremendous influx of immigrants during the late 1800s, dairy manufacturing has been largely an American proposition. That trend continued well into the next century.

However, the ownership structure started to evolve in the late 1990s as Canadian companies began establishing processing outposts in the American countryside. As that development ensued, European manufacturers joined the acquisition parade, focusing the most energy on buying dairy processing assets previously held by U.S.-based companies and cooperatives. From that moment in time, the influx of foreign capital grew substantially.

When taking a 30,000-foot view of the global dairy sector, there is good reason for this evolution. That's because dairy products have become a globally traded commodity. And when looking at the world's leading exporters, New Zealand and the collective countries in the European Union, their ability to expand milk production will be limited in the long term. For the Kiwis, it's a limited land base, while the Europeans also have land constraints along with significant regulatory burden. Then there's the matter involving Canadian processors that really cannot grow at home due to the constraints of supply management that place a muffler on milk production.

Those and many other factors have turned dairy executives' eyes toward the U.S. mainland in order to grow their dairy portfolios. The U.S. has a steady stream of milk that keeps growing. In addition, the cost of stainless steel and modern processing costs are sky high, so it's more cost-effective to buy existing assets and market share than it is to build a new plant.

America stood on its own

When winding the clock back to 1996, the top 10 dairy processors were exclusively American-based entities. Of the top 10, six were companies and four were farmer-owned cooperatives. Kraft topped the list with \$3.9 billion in sales followed by Dean Foods at \$1.6 billion, according to data assembled by Dairy Foods magazine.

Rounding out the companies were: No. 5, The Kroger Company; No. 6, Schreiber Foods; No. 8, Leprino; and No. 10, Conagra which included its holdings in Beatrice Cheese. Going back to Kraft, the leading processor, it had combined worldwide sales of \$16 billion in 1996, so 75 percent of its portfolio was international sales.

Among the top co-ops were: No. 3, Land O'Lakes; No. 4, Mid America Dairymen (eventually it merged into Dairy Farmers of America or DFA); No. 7, Associated Milk Producers Cooperative (it had a division merge into DFA); and No. 9, Prairie Farms.

Canada stakes its foothold

During the ensuing decade, two Canadian enterprises swiftly moved into the top 10 U.S. processors. Saputo, a publicly traded company, skyrocketed to the No. 3 position with its \$3.8 billion in North American sales. According to annual reports, it first entered the U.S. market in 1997.

Its Canadian dairy cousin, the Agropur Cooperative, appeared at No. 9 on the Dairy Foods magazine's top processor list with \$2.13 billion in North American sales. At that time, the co-op based in Longueuil, Quebec, Canada, had only one U.S. plant that purchased milk from U.S. dairy farmers but offered no membership to those farmers. So, even though it is a cooperative, Agropur operates more as a company in the U.S. than as a cooperative like it does in Quebec.

Outside of those two new foreign entities, there were only two other new faces on the list as shown in the table. The first was HP Hood at No. 6 with \$2.3 billion in sales. It had climbed from the 27th position just one decade earlier. Also new on the list was DFA, which ranked No. 8 with \$2.13 billion in sales. Of course, that co-op was created via mergers.

Also of note, it now took \$2 billion in sales to remain among the top 10 processors in 2006. When looking back to 1996, only one dairy processor had sales over \$2 billion; that was Kraft. Also, only two U.S. dairy co-ops remained among the top 10 — half the number from just 10 years earlier.

Top 10 dairy processors for 1996		
Rank	Company	Sales
1	Kraft Foods	\$3.90 billion
2	Dean Foods	\$1.60 billion
3	Land O'Lakes	\$1.53 billion
4	Mid America Dairymen	\$1.41 billion
5	The Kroger Company	\$1.38 billion
6	Schreiber Foods	\$1.36 billion
7	AMPI	\$1.21 billion
8	Leprino	\$1.20 billion
9	Prairie Farms	\$1.19 billion
10	Conagra	\$1.08 billion

Source: *Dairy Foods* magazine

Top 10 dairy processors for 2006		
Rank	Company	Sales
1	Dean Foods	\$10.10 billion
2	Kraft	\$4.30 billion
3	Saputo (Canada)	\$3.80 billion
4	Land O'Lakes	\$3.40 billion
5	Schreiber Foods	\$3.30 billion
6	HP Hood	\$2.30 billion
7	Leprino	\$2.20 billion
8	DFA	\$2.17 billion
9	Agropur Co-op (Canada)	\$2.13 billion
10	The Kroger Company	\$2.10 billion

Source: *Dairy Foods* magazine

Top 10 dairy processors for 2016		
Rank	Company	Sales
1	Nestlé USA (Switzerland)	\$12.1 billion
2	Dean Foods	\$7.7 billion
3	Saputo (Canada)	\$7.3 billion
4	DanoneWave (France)	\$6.0 billion
5	KraftHeinz	\$5.6 billion
6	Schreiber Foods	\$5.0 billion
7	Agropur (Canada)	\$4.5 billion
8	DFA	\$4.2 billion
9	Lactalis American Group (France)	\$3.9 billion
10	Land O'Lakes	\$3.8 billion

Source: *Dairy Foods* magazine

The Europeans grow their presence

The dairy-processing arena continued to transform. By 2016, it took \$3.8 billion in sales to crack the top 10 list, almost double from a decade earlier. Even with that as the baseline, three European companies joined the top ranks. Nestlé USA claimed the top position with \$12.1 billion in sales after ranking No. 29 in 1996 and No. 35 in 2006, according to Dairy Foods. At No. 4 was French-based DanoneWave with its \$6 billion in sales. By CoBank estimates, DanoneWave has 34 percent market share in the U.S. yogurt market. It had ranked No. 24 in both 1996 and 2006. The Lactalis American Group, also controlled by a French company, debuted at No. 9 with \$3.9 billion in sales after not even appearing on the 1996 or 2006 lists.

The pair of Canadian companies essentially held their positions but grew sales significantly. Remaining at No. 3 was Saputo, now with \$7.3 billion in sales, up \$3.5 billion. The Montreal-based company had acquired 24 U.S. plants in just 20 years. Meanwhile, Agropur grew to \$4.5 billion in sales and now ranked as North America's largest dairy cooperative . . . even higher than DFA and Land O'Lakes, growing by \$2.4 billion.

Meanwhile, two U.S. dairy co-ops remained among the top 10, but barely. DFA ranked No. 8 with \$4.2 billion in sales, while Land O'Lakes had \$3.8 billion and ranked No. 10. Both sales figures represented solid growth, but competitors stepped up the game.

A deeper look into foreign ownership can be quite revealing. In 2016, 12 of the top 50 "U.S. dairy processors" had headquarters outside the country. These "Foreign 12" held 111 processing plants, according to Dairy Foods' data. That total grew by 72 plants in one decade as the group only had 39 processing assets in 2006.

As plant totals grew, so did sales. In 2006, the "Foreign 12" had sales ranging from \$1.45 million to \$300 million. Just 10 years later, sales for the same group ranged from \$12.1 million to \$603 million.

Significant market share

While it is tough to place a firm number on market share, foreign-owned interests may process 11 to 12 percent of U.S. milk based on this research. A recent CoBank report indicates at least 15 percent of the U.S. milk supply is processed by plants that are at least partially foreign owned. Longtime dairy industry analyst Roger Cady took this one step farther by estimating that foreign-owned grocers and international processors may control up to 25 to 28 percent of U.S. milk.

Given the number of times New Zealand's Fonterra cooperative has been in the headlines over the years, it should be noted that Fonterra ranked far down the list — at No. 40 with \$874 million in North American sales.

Canada has become a big player in U.S. markets

Unable to grow at home, Canada's two largest dairy processors now obtain 44 and 53 percent of their dairy product sales from United States operations.

AMERICA has grown its milk production tremendously in the past 20 years. In 1996, 9.35 million U.S. dairy cows collectively produced 154 billion pounds of milk. By 2016, the dairy herd was essentially the same in size at 9.38 million cows. However, those cows produced 212 billion pounds of milk — that's a 37 percent growth rate in just 20 years.

That fact alone has encouraged foreign dairy processors to heavily invest capital into U.S. dairy processing assets. And among the largest investors have been a pair of Canadian dairy processors — one a publicly traded company and the other a dairy cooperative.

From a business growth standpoint, those two organizations have had limited opportunity north of the U.S. border. That's because Canada's dairy production grew only 8.5 percent from 1996 to 2016 . . . restricted by self-imposed supply limits known as supply management. During that time span, the nation's collective milk output climbed from 17.6 billion pounds in 1996 to 19.1 billion in 2016, according to the government of Canada.

Agropur grows on U.S. milk

Prior to 2006, Agropur had just one U.S. dairy plant. However, combined with its Canadian operations, it totaled \$2.13 billion in sales. From that point, it grew significantly. With a strong Canadian dollar and a favorable exchange rate, the Quebec-based co-op purchased Trega Foods, a Wisconsin cheese company, and Schroeder Milk, a Minnesota dairy processor, in 2008.

It double-downed on the acquisitions one year later when it purchased Michigan's Farmland Dairies and Iowa's Green Meadow Foods. The very next year, in 2010, it bought Main Street Ingredients, a Wisconsin processor.

After going silent for a number of years, it stepped back into the acquisition arena in a big way by purchasing Davisco Foods with plants in Minnesota, South Dakota, and Idaho. In addition, Agropur acquired Davisco's sales offices in China, Singapore, and Switzerland, along with distribution centers in China and the Netherlands. With that purchase, Agropur doubled its U.S. capacity and instantly raised its global milk intake 50 percent.

Given all these U.S. assets, one could argue that Agropur is rapidly approaching the tipping point of being a U.S. cooperative with a home base in Canada. That's because 44 percent of Agropur's sales came from U.S. operations in 2016.

An even bigger player

Saputo has an even larger footprint in the United States than its cooperative cousin. These days, the company is really an American dairy processor with headquarters in Canada. According to its own annual reports, Saputo had \$11 billion in global revenue. Of that total, 52.6 percent came from the U.S.; 34.8 percent from Canada; and 12.6 percent from other countries.

To grow that U.S. footprint, Saputo spent in excess of \$2.6 billion to acquire U.S. market shares since 1997. Those estimates come from numbers that could be documented from the company's annual reports. Let's take a quick look.

In 1997, Saputo purchased Stella Foods for \$405 million and its 12 plants in five states. ConAgra and its Treasure Cove and Nauvoo Blue brands joined the Saputo family six years later. Next came a pair of acquisitions from dairy cooperatives. In 2007, it purchased the Tulare, Calif., Land O'Lakes plant for \$216 million. The very next year Saputo purchased the Wisconsin-based Alto Dairy Co-op for \$160 million. At the time, Alto ranked No. 17 among all U.S. dairy cooperatives based on milk volume.

In 2009, it purchased California's F&A Dairy for \$44.5 million and two years later added Fairmount Cheese for \$270.5 million. In 2012, Morningstar Foods, previously a Dean Foods asset, joined Saputo's portfolio with a \$1.5 billion price tag.

Silent on the U.S. front for five years, Saputo added two more entities in 2017 . . . one was Self-Life Products for \$47 million. That was the third purchase Saputo made with a U.S. dairy cooperative. This time it was with Southeast Milk based in Belleview, Fla. The final dairy asset included Wisconsin's Betin Cheese and its \$118 million in annual sales of goat cheese.

When looking at Canada's presence in the United States, it should also be noted that a number of U.S. companies operate north of the border, too. While Saputo and Agropur rank first and third, respectively, in Canada, Kraft Heinz Canada ranks No. 2, and Hershey Canada ranks No. 7, according to *Food in Canada* statistics.

From a European perspective, Nestlé and Danone also rank among the top 10. However, no U.S. dairy cooperative has a significant footprint in Canada like the Agropur Cooperative has in the U.S.

Weighing the value

There are a number of takeaways when evaluating this situation. Canadian investment into America's dairy processing sector came at a time when capital investment has been needed to grow processing capacity. Had it not been for this investment, there would be even fewer processing homes for the burgeoning U.S. milk supply, especially in the Midwest. However, one could also argue that because these two Canadian entities received higher margins for their products in Canada that the extra profits place U.S. processors, especially co-ops, at a disadvantage when bidding on neighboring U.S. dairy processing assets.

To be fair, U.S. cooperatives and domestic processors must retool operations. Without robust investment, there will be more of the same when it comes to acquiring U.S. dairy processing assets.

To say the least, it's a complex situation.

These two Canadian processors . . . one being a cooperative . . . like the abundance of the U.S. milk supply. But at the same time, they staunchly defend supply management at home. That's a difficult position as a trade dispute boils over between the U.S. and Canada. Then there is the matter of loyalty. For any foreign entity, the first loyalty typically lies with its home base . . . and secondly to its U.S. partners.

Dairy could also fracture. U.S. dairy farmers must maintain multiple social licenses to operate their businesses. In the past, that has included connections with consumers, the United States Department of Agriculture (USDA), the Food and Drug Administration (FDA), the Environmental Protection Agency (EPA), and others. With 11 to 12 percent of our milk being processed by foreign partners, those foreign companies need to have people at the conversation table so we can collectively meet consumer demands.

Tight capacity and falling premiums

As milk production has grown, plant capacity has not kept pace. However, the falling premiums may be a symptom of a larger problem.

THE dairy landscape continues to evolve. As this has taken place, an assertion that I hear quite often is that the U.S. capacity to process milk is inadequate. Let's unpack that statement just a bit and examine what we know in this fourth article in a series on the changing landscape of U.S. dairy plants.

Milk gets dumped

It isn't unusual for a small amount of milk to never make it to the plant or to be rejected because it is contaminated or spoiled. This unprocessed milk is typically less than 0.4 percent of producer receipts within a federal order.

Occasionally, milk gets dumped because there isn't an accessible market for it. The graph depicts milk in the Northeast Federal Order from 2013 to the present. The 2013 trend line is typical of previous years with a small amount of milk rejected at plants for contamination or quality reasons.

But you can see that beginning with the summer of 2014, a greater amount of milk was dumped in some months because there wasn't a market or processing home in the region. This milk was not spoiled. In some months during 2016 and 2017, the volume approached 2 percent of producer receipts in that market.

The graph showing the dumped milk represents the volume that was allowed to be pooled at \$0 per hundredweight (cwt.). The lost value was spread across all producers in the market area.

Deep discounts

This pooled milk at \$0 per cwt. is an indication of a market that is overburdened with milk. When this is the case, cooperatives will sometimes sell milk to a customer at a deep discount — maybe as little as 30 to 70 percent of the manufacturing price in the region.

These sales are referred to as “distressed milk,” and because the milk is not pooled on the order, those volumes and prices do not show up on the market administrator's pool calculation and are not publicly available. The value isn't \$0, but it is well less than the federal order minimum prices.

Dumped milk makes it seem like the area or region lacks the capacity to process it into manufactured products like cheese or butter and powder. This may be true, but it may also be because a plant simply lacks a customer for additional product. Distressed milk sales are often an indication that there may be a customer available at the right price, but that price is not what the plant could sell it for and pay federal order minimum prices for the milk.

Seek a pleasant peninsula

“If you seek a pleasant peninsula, look about you” — that is the state motto of Michigan. I (Mark) know that because I grew up in Michigan, and my second, third, and fourth grade teachers made sure we all knew that, along with the state bird (robin) and the state animal (wolverine). I always wondered why the state did not produce more milk. Its agronomic resources were ideally suited to dairy cows, and there were large tracts of very fertile land just begging to grow corn and alfalfa.

Michigan was a little late to the game, but they now have the highest milk production per cow in the country and they have doubled their total milk production since 2000. Michigan is, in fact, the poster child for distressed milk sales.

By our calculations, Michigan plants have the capacity to process just a bit more than 9 billion pounds of milk annually, and the state is producing more than 11 billion pounds of milk. That is a little more than 100 tanker loads of milk a day that need to find a processing home.

And, because the state is a peninsula and you can't drive across Lake Michigan, you have to take the long way around and through Chicago to reach plant capacity in Wisconsin or other states. Transporting milk that far is expensive and, since Wisconsin and almost every other nearby state has been growing milk production, you are probably going to have to sell that milk at distressed prices to find a willing customer.

Michigan once was a state with significant premiums paid for milk. However, the combination of high transportation costs and faltering sales has moved the state's All- Milk price from about the middle of the pack in 2011 (26th out of 50) to dead last in 2017. And those sales of distressed milk in other states have put considerable price pressure on premiums in other states as well.

Michigan probably has a capacity problem.

But capacity is hard to define, and in other states it may not be a strict physical limitation on how much milk we can get through the stainless steel. For instance, many plants don't process seven days a week . . . could they process an additional day?

Or maybe they only run one or two shifts . . . could they process an extra shift or a few more hours to run an additional vat or two if the labor can be found?

Even cooperatives operating butter-powder plants might be able to take a bit more milk under different circumstances. Four years ago, nonfat dry milk prices were more than \$2 a pound but it has been below \$1 a pound for the last three years. If nonfat dry milk was \$2 a pound, plant capacity would probably show up in regions where milk has been dumped. Plants — even those operated by cooperatives — are reluctant to make product that they don't have a customer for.

Capacity in a region is a squishy number.

When are premiums coming back?

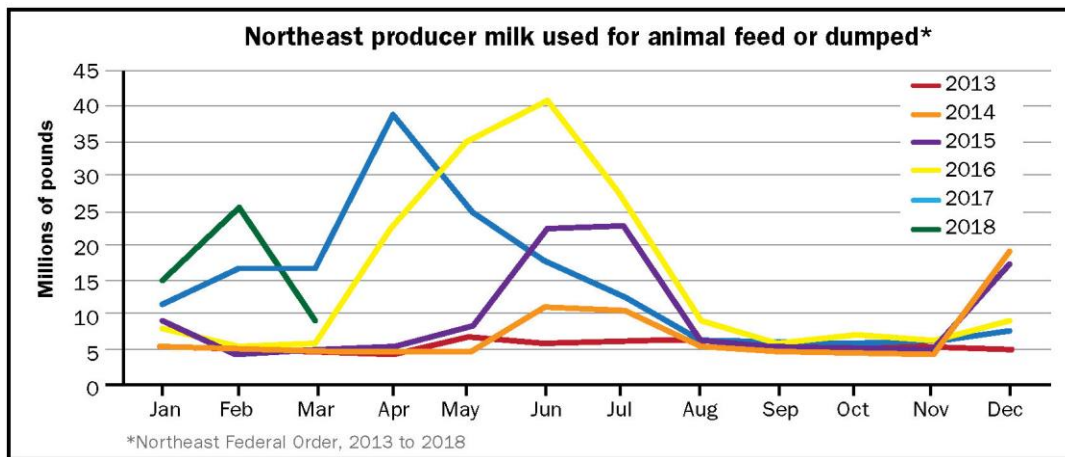
Dairy markets are already turning, and we can see the low prices of 2018 in the rearview mirror. However, we suspect that it may be a long time before our premiums come back to anything like they were before burgeoning milk volumes were such an issue. We have plenty of milk for the foreseeable future.

Another stress point in the industry has been the product price formulas used by federal orders. When the federal orders calculate the minimum prices each month, they start with the wholesale prices of dairy products and impute the value of milk that was used to make them.

These formulas contain something referred to as the "make allowance" that accounts for all of the nonmilk costs of processing the products. Those costs, such as labor, utilities, packaging, and so forth, have changed over time, but most of the product price formulas, including the make allowances, have not been changed since they were put in place back in January of 2000. When

cheese or butter prices go up, so too does the price of milk, and processors are having a hard time covering the nonmilk costs.

Sales of distressed milk at below federal order minimum prices has given plants a place to find some relief because it isn't pooled and is not subject to a make allowance. This extra milk has also given them a justification to reduce overorder premiums plants had been paying for pooled milk. The relief may have been needed, but I don't think that plants will be in any hurry to bring the premiums back until the make allowance issue has been addressed.



The pathway forward for U.S. dairy

While milk is a commodity business and costs will drive dairy farm success, additional plant infrastructure will help, too.

WITH four previous articles, we have been reviewing the current state of the U.S. dairy industry. We have talked about regional shifts in milk production, expanded opportunities and challenges from export sales, difficulties with regulated milk pricing, foreign ownership of processing plants, lack of processing capacity or customers for products in some regions, and the impact on milk prices from dumped or distressed milk sales. In this article, we would like to conjecture about what these factors may mean for you.

Milk will still be a commodity

Specialized product manufacturers that produce iPhones or corn planters will try to differentiate themselves by their design and features. This customization allows manufacturers to set their own price for the item. Of course, economics is still at play, and consumers get to decide just how many of these items they want to buy at the offered price.

A commodity is different.

Commodity producers cannot distinguish their product features from other producers . . . except by price. Price will retreat to a level where consumers and producers agree, and they are willing to buy and sell the amount needed to just clear the market. For a dairy farmer, the price is given by the marketplace, and the primary influence that an individual can have on their profits is to be a low-cost producer.

The ambition of becoming a low-cost producer is why so much effort is put into research and education. It is also why there is an unrelenting pursuit to adopt new technologies that may shave a few cents off of the production of 100 pounds of milk. Being among the first adopters of new technologies and employing better management practices will provide a temporary benefit until others adopt and reduce their costs of production, too.

Occasionally, we get a chance to slightly distinguish our product. A decade ago, producing 150,000 somatic cell count (SCC) milk meant that your product was significantly better than the average. And there were plants that were willing to reward you with a higher milk price because your milk was noticeably different from the commodity-based market.

Today, low SCC milk has become commoditized and premiums for high quality have eroded. We can begin to see some of the same process happening with organic milk production, and it will happen with A2 milk, if that ever becomes a major selling point for consumers.

Milk prices will still be volatile

Almost by its definition, a commodity is produced in what an economist would call “an uncoordinated supply chain.” In our example above, Apple will not manufacture more iPhones than it thinks it can sell at its announced price. The same thing is true of John Deere with its corn planters. But individual farms seldom think about that price-quantity relationship.

In a year like 2014, when milk prices soared to all-time highs and producers generated significant profits, they correctly interpreted the market signal as consumers telling them “we want more of your product.” But, when 40,000 individuals receive that message at the same time and make independent production decisions, they collectively can overshoot demand and suffer low milk prices as a consequence — and we are still there today.

An uncoordinated supply chain is not inevitable. Production quotas are one means of helping to instill organization and discipline into a commodity market. A heavy hand can be used — like Canada has done. A lighter hand will also have an effect, as we are beginning to see, with cooperatives and even proprietary handlers imposing temporary production controls over their suppliers. And U.S. banks may even require a letter from a producer’s handler indicating they will accept more milk before granting credit for expansion loans.

However, agriculture is subject to the whims of Mother Nature, and every time the pastures in New Zealand wither under an El Niño, or a wet spring delays planting in the Corn Belt, milk production receives a shock otherwise described as an unanticipated change. Shocks may occur when we have a global recession and countries decide they can’t afford to buy as much product, as happened in 2009. Policy changes also create shocks as they did when the European Union lifted production quotas a few years ago.

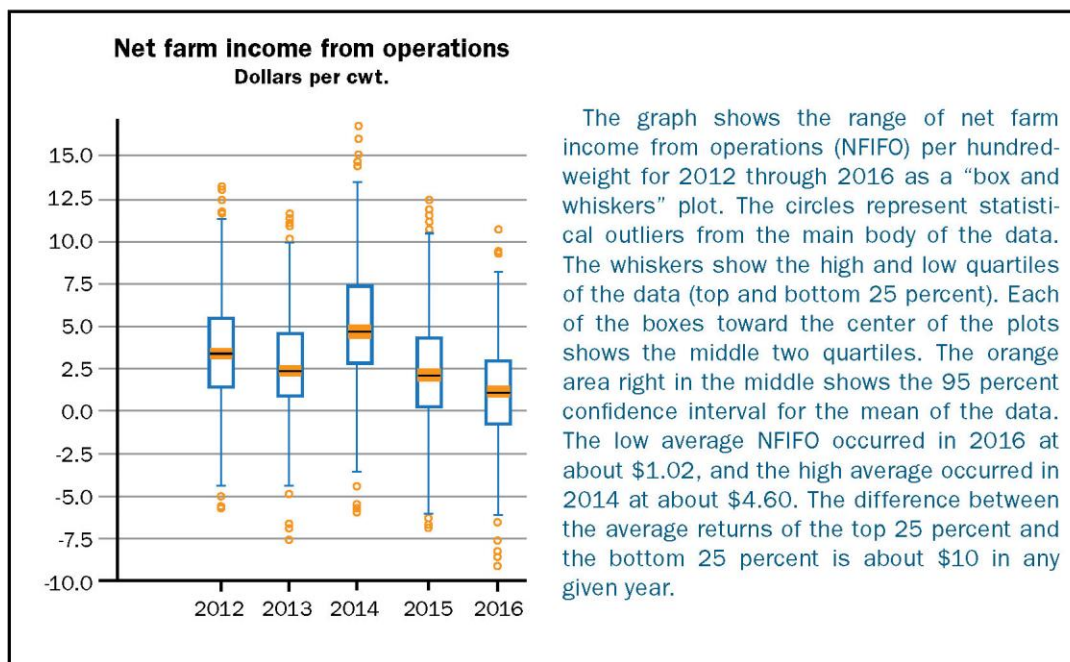
Commodity industries with significant delays between market signals and production response will always experience price volatility from shocks.

Milk production still shows promise

The University of Wisconsin works with producers and collects hundreds of detailed financial records every year. These records can be extremely useful for individual producers to see where they should focus their efforts to reduce production costs — something that is paramount in this commodity business. The records show the range of success that has been experienced by these businesses.

In every year, there is a \$10 difference between the net farm income on a per hundredweight basis from the top 25 percent and the bottom 25 percent of producers (see graphic). Any farm can experience a particularly good or bad year for a variety of reasons, but the farms in the top and bottom 25 percent tend to be the same group of individuals year after year.

A \$10 difference is very large and suggests that there are still opportunities for the best producers. However, to be a top performer in a commodity market is a lifetime pursuit. If you work hard and give it your best effort when you are young, the only way you will stay in that top group is by continually striving to get better. Today's top group could be tomorrow's bottom group. You don't have to outrun the bear, but to avoid being eaten, you do have to be faster than the slowest member of the group.



A message to dairy leaders

Until recent years, change to dairy markets has been subtle. However, markets are evolving at a far quicker pace. While we still need specialized dairy product plants, component balancing has become an issue rising to the forefront.

That makes developing new processing infrastructure a top priority. The collective U.S. dairy industry needs to produce the right products for the right markets. This not only includes the domestic market but the growing dairy export market. Most importantly, the plants will need to be located in growing milk sheds.

These are expensive projects. Some companies and co-ops may decide to go it alone, while others will need to form strategic partnerships. At the end of the day, the U.S. needs more dairy plant capacity that creates products consumers both here and abroad want to buy. And those products must be competitively priced for the world market.

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