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# Dairy Processors Race to Keep Pace with Milk Production

## Key Points:

- Milk processing capacity has struggled to keep pace with the growth in milk production.
- Coops are largely bearing the burden of the near-term oversupply of milk, and are increasingly looking for ways to discourage producers from expanding.
- The dairy industry experienced a wave of investment in milk powder plants in recent years. These plants are typically less expensive, and have positioned companies for competitiveness in export markets.
- Investment interest in cheese plants is increasing, often in the form of joint ventures due to the high cost.
- An additional 27 billion pounds of milk processing capacity will be needed in the U.S. over the next 10 years if current trends persist.
- International companies are increasingly targeting partnerships with U.S. companies as well as independently establishing manufacturing footprints in the U.S. to gain access to the U.S. milk supply for what is expected to be long-run growth in global demand.

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## Introduction

Every year, U.S. dairy farmers produce 3 billion more pounds of milk than the previous year. All of that milk needs to be processed before it makes it to consumers' homes as fluid milk, cheese, butter, yogurt or an ingredient in a myriad of other foods. Unlike other agricultural commodities, the perishability of milk requires that it be processed almost immediately after being produced. Dairy processors are faced with the challenge of handling an ever-growing supply of milk, while anticipating the right product mix to meet consumer demand.

Traditionally, private companies have been more inclined to develop new products to meet consumer demand, while cooperatives, who are obligated to market all of their member's milk, have played a balancing role of finding an outlet for the excess supply. For this reason, it is more common to see butter and powder plants owned by cooperatives for their relative affordability and the longer shelf life of the products. It is more common to find privately held cheese plants or yogurt plants.

Lower milk prices over the past couple of years have led to lower input costs for many processors. This has strengthened balance sheets and opened the door to the opportunity for expansion. In some cases this may mean upgrading existing, aging facilities, while in other cases it may mean greenfield plant projects.

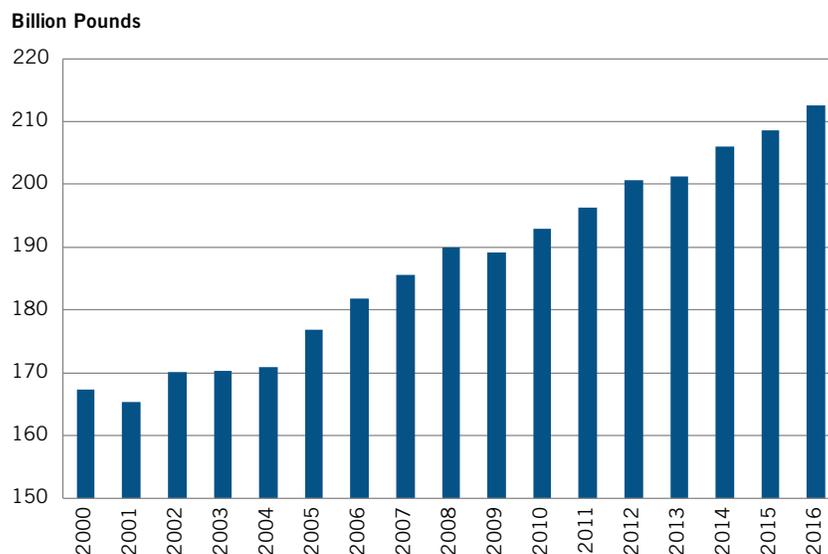
### **Production Growth**

Milk production has been increasing steadily since the 1970s. This growth has been driven by increasing cow numbers as well as higher yields of milk per cow. There are natural efficiency gains achieved by economies of scale which have driven consolidation into much larger herd sizes. The geography of the industry has changed as well. Farms have moved into regions other than the traditional dairy producing regions of the Northeast and Upper Midwest, and they have tended to do so on a larger scale where property values and regulatory burdens are lower.

While the rate of growth may experience ups and downs, the overall trajectory of milk production continues to point upward. (See *Figure 1*.) Despite a couple years of relatively lower milk prices, low feed prices have kept margins positive in a range that continues to encourage expansion. If feed costs remain low, production growth should continue at a rate between 1.5 and 2.5 percent in coming years. A sustained increase in feed costs is the most likely driver of any contraction in milk production. Large scale producers see growth now as an opportunity to position themselves for the long run opportunities in worldwide demand growth, and they are less sensitive to monthly changes in milk price.

For the last few years, the growth in production has outpaced processing capacity growth. This has led to milk being dumped during the spring flush period in both the Northeast and the Mideast. These regions have the most immediate need for additional processing

**Figure 1: Total U.S. Milk Production**



Source: USDA-NASS

capacity, but higher property values and more difficult access to export markets make decisions to build new plants more challenging.

Cooperatives have struggled to handle this growth in milk production in many cases. The role of the cooperative has traditionally been to take as much milk as their members want to make and market that milk on their behalf. Now, however, many coops are shutting their doors to new members and are devising various mechanisms to discourage their members from expanding production.

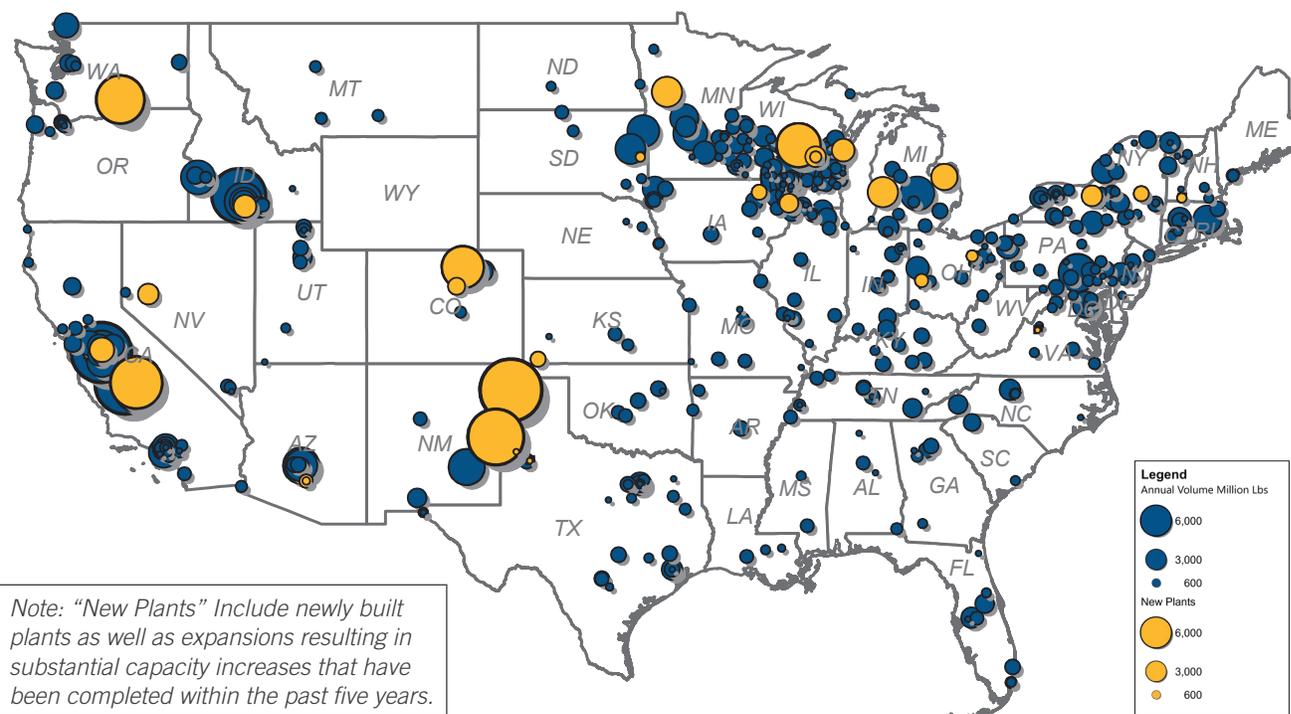
### **Processing Expansion**

As production has grown and shifted into new regions, the processing industry has followed. There are at least 15 sizeable dairy plants that are under construction as either greenfield projects or expansions to existing plants. In addition, there are several more plants that have been completed in recent years.

Over the past few years many coops as well as independent processors have focused on building and expanding powder processing plants. This has the double benefit of being the least expensive type of plant while also strengthening the competitiveness of the U.S. export



Figure 2: Annual Milk Processing Capacity



Note: "New Plants" Include newly built plants as well as expansions resulting in substantial capacity increases that have been completed within the past five years.

Sources: The McCully Group, CoBank

market for milk powders. These plants have been popular in California and the Southwest since Southeast Asia and Mexico are the primary destinations of milk powder.

Historically, cooperatives operated balancing plants which made primarily butter and nonfat dry milk. These plants took excess milk supply and converted it into more storable commodities. Butter could be frozen and held until demand picked up in the holiday season, and powder could be stored on warehouse shelves for eventual export. In recent years, however, the milk powder processing infrastructure has made significant advancements both in Europe and the U.S. New larger-scale plants that can process specific types of powders to meet international demand will have a distinct advantage. Without updates, some of the midsize aging commodity plants will struggle when competing against more modern powder plants.

While export demand has been growing, and driving the investment in powder plants, fluid milk consumption has

been slowing with U.S. consumers. Despite this, there are a few investments going on in fluid milk bottling plants to process specialty products like organic milk, or to upgrade and replace existing aging infrastructure. Aurora Organic dairy is building a new plant in Missouri, Wal-Mart is getting into fluid milk processing with a new plant being built in Indiana, and HP Hood recently purchased what was originally built as the Quaker-Muller yogurt plant in Batavia, NY. The plant is now expected to become a fluid processing plant for extended shelf life products.

Cheese plants are among the most expensive plants to build, but can potentially handle much more substantial amounts of milk. In recent years there have been only two major new cheese plants built, and a few expansions. Cheese plants are significantly more expensive to build than powder plants, and due to the high cost, and limited margin, they have historically been operated by private processors rather than coops.



Along with cheese plants come whey processing plants to process the whey stream that is produced as a byproduct of cheese. Whey processing has evolved in recent years away from simply drying the whey as-is toward filtering and separating the components of the whey into whey protein concentrates or isolates and permeate. Whey protein concentrates have grown in popularity in supplements as well as ingredient applications and have created a significant revenue stream for cheesemakers from what had once been a burdensome byproduct.

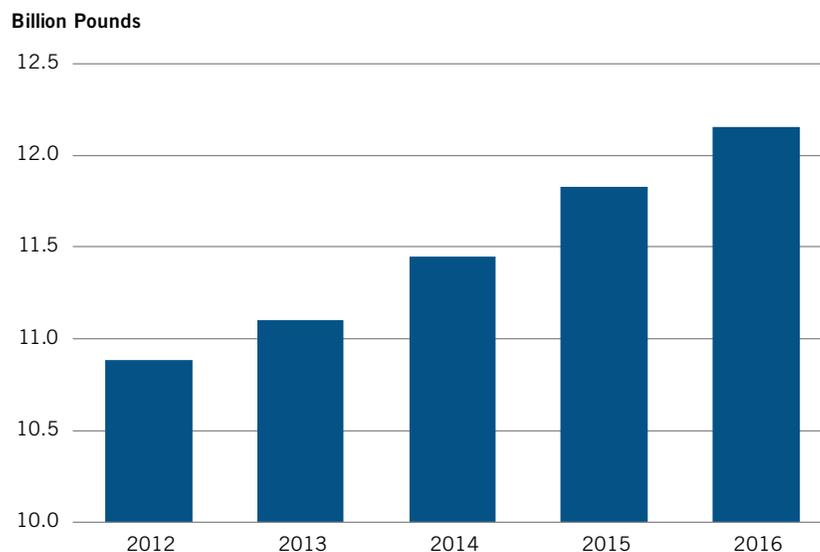
There have been recent expansions to cheese plants in the Southwest and new plans for expansion in the Upper Midwest to relieve some of the capacity constraints the region has been up against in recent years. (See Figure 3.) Increasingly, cooperatives are setting their sights on cheese plants as opposed to commodity balancing plants, and they have looked to joint ventures as a means of doing this. Greenfield projects and expansions are being planned in the Mideast region which has not been able to keep up with surplus production in recent years.

### **Foundations of a Successful Plant**

The price tags on new manufacturing plants are high, and as the need for processing shifts from powder manufacturing toward cheese manufacturing, they are getting even more expensive. Once the plants are running, the federal milk marketing order pricing formulas, and the market in general, tend to limit potential returns. When combined with the standard complexities of building and operating a large manufacturing plant, the risks can be high.

One of the most common ways to reduce these risks is to disperse them across a number of parties through joint ventures. This has been a common approach recently,

**Figure 3: Total U.S. Cheese Production**



Source: USDA-ERS

particularly in the building of new cheese plants. This also makes more capital available for the project. Ideally, at least one of the partners will have management experience operating similar processing plants.

It is critical to ensure that milk supply will be available to the plant. While finding milk seems like it would be the least of a new plant's concerns today, it is still important to have producers prepared to provide a reliable supply of milk to the plant. In many cases, establishing some level of buy-in where these producers can share in the success or risk of the new plant can mitigate the risk of a reliable supply and help control milk input costs.

Even more critical than milk supply, especially given the current oversupply situation, is having ample demand lined up ahead of time. The desire to build new manufacturing plants is often initially driven by the need to process additional milk supply. However, the only sustainable driver in the long run is demand for the finished product that the plant is making. At least for the initial stages of production at a new plant, an offtake agreement should be in place to ensure there is demand for the finished product.



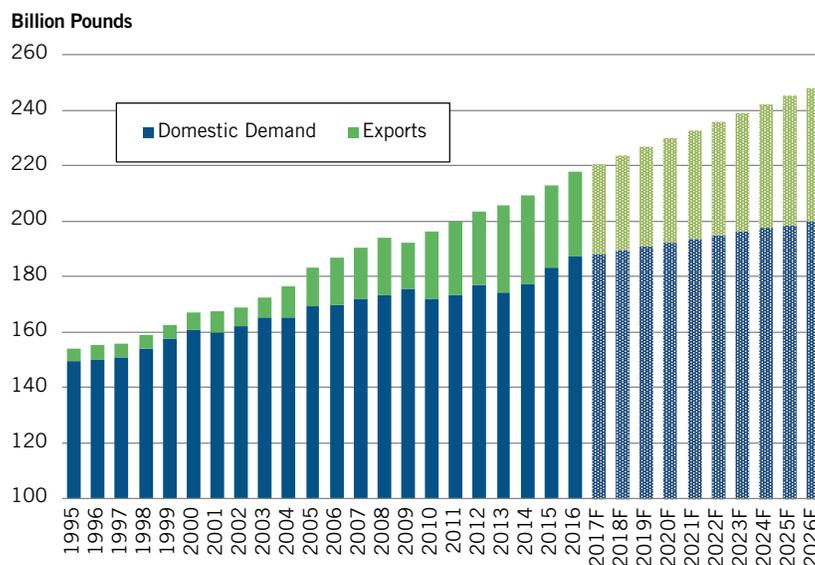
### Interest from Abroad

While U.S. based companies and cooperatives expand and look for opportunities to grow exports, many international companies are looking for ways to establish a U.S. manufacturing footprint. One of the most notable examples is the presence of Canadian companies and cooperatives in the U.S. Due to the Canadian supply management and quota system, there is limited upside growth potential for processors, so they look to the U.S. for growth. Both Agropur and Saputo have established manufacturing presences, especially in the Upper Midwest.

Part of the appeal of the U.S. is the relatively high quality, reliable milk supply. Chinese consumers have long been distrustful of Chinese milk, especially since the melamine scandal of 2008 in which six children died and over 50,000 were hospitalized due to milk and infant formula that had been adulterated with melamine. China has already established themselves in other regions, like Australia, but they are increasingly interested in being able to take advantage of the U.S. milk supply.

This trend of foreign interest in the U.S. dairy industry is likely to grow in coming years. There have been international partnerships and joint ventures for years in the industry, but the interest seems to be gaining momentum. Irish company Glanbia has had a strong presence in the U.S. for many years. Recently, French company Danone acquired Whitewave and Danish cooperative Arla has formed a joint venture with American cooperative DFA on a cheese plant. Part of Danone's acquisition of Whitewave required the sale of the Stonyfield organic yogurt brand. Two of the strongest publicized early bids for New Hampshire based Stonyfield were from Grupo Lala in Mexico and Inner Mongolia Yili Industrial Group in China. The winning bid eventually came from Lactalis, a French dairy company.

Figure 4: Total Demand for U.S. Milk



Sources: USDA-ERS, CoBank

### Outlook

Milk production in the U.S. is showing no signs of slowing, but that growth will not be sustainable unless processing capacity is able to keep pace. Similarly, and even more importantly, an expansion of processing capacity will not be sustainable unless there is ultimately consumer demand to back it up.

The majority of demand for dairy products produced in the U.S. will continue to come from domestic consumers, but a growing share will come from abroad. Currently, about 14 percent of milk solids produced in the U.S. are exported. That share is expected to grow closer to 20 percent in the next ten years. Exports in 2016 were valued at \$4.83 billion. The primary destinations are Mexico, Southeast Asia, Canada and China. The biggest opportunities for growth are likely Southeast Asia, the Middle East and North Africa.

A number of milk plants, cheese plants and powder plants are planned or are under construction and expected to come online within the next couple of years. This is in addition to expansion of existing plants. If consumer demand and farm production continue on their trajectories, an additional 27 billion pounds of



annual milk processing capacity will be needed by 2026. (See Figure 4.) Finding the proper balance between supply and demand along the way as that capacity is built will be a challenge and will likely cycle through periods of near-term surplus and shortage.

Processing expansion right now is in large part supply-driven. While it is concerning in the short run to see product inventories build in warehouses, world-wide demand still shows strong potential for growth. As large populations in the developed world begin to age, they will focus on healthy-aging, while new population booms in the developing world will be seeking infant nutrition. Both of these trends present significant opportunities for dairy processors who can serve these demographics. In the meantime, while these markets develop and demand catches up, oversupply will continue to be burdensome at times.

Fluid milk consumption has been on the decline for many years, so there is no immediate need to grow processing capacity. There is, however, a need to update the aging fluid milk infrastructure to develop new, growing segments

of demand including organic milk, which has lacked dedicated processing plants. There is also increasing international interest in ready-to-drink long shelf-life milk for import as opposed to reconstituted powder.

Over the next couple of years, the new plants and planned expansions will likely be sufficient to keep up with production growth. But, the industry will need to continue to invest in growth and plant updates over the long run to remain competitive. Processors will need to stay focused on the consumer, whether domestic or international, and form partnerships as needed to meet demand. At times of surplus milk, the need for added processing capacity in any form seems critical, but for the long-term health of the industry, the focus should be on building the right type of capacity to meet growing global demand. ■

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