

AGRICULTURAL FINANCE

Cheese Market Insight

Executive Summary

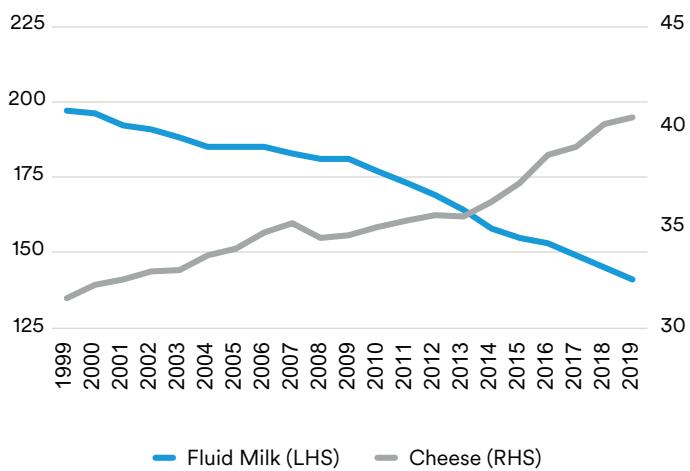
Uncertainty in the U.S. dairy sector remains elevated to start 2021 as long-term trends continue to be impacted by COVID-19. Demand growth over recent decades has been fueled by exports and increased domestic cheese consumption. Meanwhile, a geographic shift within the sector continues as U.S. producers look to supply the growing demand for dairy, both domestic and abroad. However, a confluence of factors in 2020 led to significant shifts in supply chains and created opportunities and challenges for cheese processors. We expect the impact from COVID-19 will continue to highlight the long-term trends and shift the U.S. dairy sector.

Trends in U.S. Dairy Demand

U.S. dairy consumption has increased 12% per capita since 1999¹. Consumer preferences over the last decade continued their long-term shift away from fluid milk consumption and towards dairy products derived from fluid milk, such as cheese and yogurt. In aggregate, increased consumption of these products has offset the consistent decline in fluid milk consumption. Per capita cheese consumption in the U.S. increased 29% since 1999 (Figure 1²). Worldwide dairy consumption also continues to rise 2% annually, fueled by greater demand from an expanding global middle class³. These new demand sources represent significant growth opportunities for U.S. producers of high-value cheeses and dairy by-products.

U.S. dairy exports have profited from rising global demand. Approximately 15% of U.S. dairy production is now exported annually, an increase from approximately 10% in 2008^{4,5}. However, not all products have benefitted equally from the expansion of U.S. dairy exports. Transportation costs make fluid milk largely unprofitable to ship internationally. Instead, international trade has been a key demand source for U.S. dairy products such as powdered milk, whey, cheese, and butter. The largest international buyers of U.S. dairy products have historically been Mexico, Japan, and South Korea⁶. The list of important markets continues to grow, though, as the U.S. shipped measurable volumes of cheese to 113 countries over the last five years⁷.

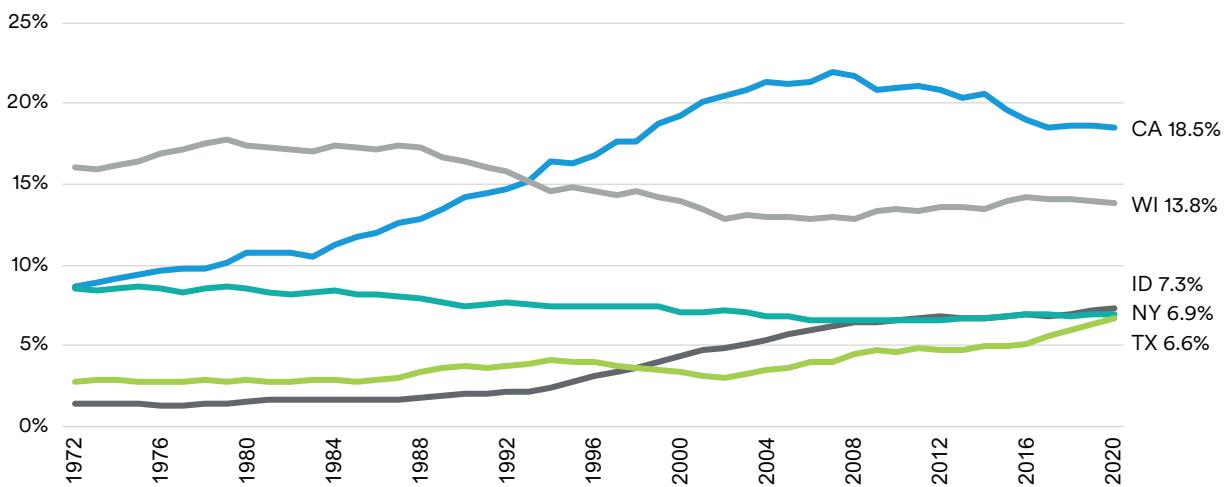
Figure 1 | U.S. Dairy Consumption (lbs per capita)



Volatility and a Geographic Shift

As cheese and exports have led to changes in what U.S. dairy products are produced, so has the geography of the U.S. dairy sector changed. Over the last several decades, the U.S. dairy sector's geographic footprint has slowly migrated from California and Wisconsin to Idaho and Texas. Idaho and Texas ascended to the third and fifth largest dairy producing states in the U.S. in 2020, with Texas likely to surpass New York as the fourth largest this year (Figure 2⁸). Technological advancements and regulatory concerns have favored expansion of the U.S. dairy industry in these non-traditional dairy states⁹.

Historically, Texas primarily produced beef cattle, but dairy production in the state has increased 68% between 2010 and 2020¹⁰. Dairy processing in the state has seen commensurate growth as well. Processing capacity in 2020 was 15% higher than 2019 as construction of new facilities and expansion of existing ones absorbed increased milk production¹¹.

Figure 2 | Proportion of U.S. Dairy Production

Several factors have fueled the surge in Texas' dairy production¹². Certain sparsely populated regions of Texas provide optimal conditions for herd health. The combination of heat and humidity are known to reduce milk production and fertility rates of dairy cattle¹³. However, humidity levels in the Texas Panhandle are generally low¹⁴. This reduces the costs to cool or heat cows, depending on the season, and provides animals with optimal production conditions. Furthermore, the relatively low development pressure in the Texas Panhandle has allowed dairy producers to construct large, efficient operations at lower costs compared to other dairy producing regions¹⁵.

In addition to herd health, Texas maintains a geographic advantage relative to other dairy producing regions. With regards to feed, Texas is the largest U.S. producer of cottonseed, a key ingredient in dairy rations, so producers face lower transportation costs to procure cottonseed. In addition to the geographic advantages for feed, Texas' relative proximity to dairy consumers, both domestic and abroad, has also supported the industry's growth in the state.

The Block and Barrel Price Dynamic

The U.S. dairy sector experienced significant volatility in 2020 as COVID-19 caused rapid shifts in consumption patterns and Chinese demand jumped for dairy byproducts. Cheese processors with the flexibility to switch between varieties produced were best positioned to respond to this volatility. Cheddar remains one of the most consumed cheeses in the U.S. and is generally produced as either 40-pound blocks or 500-pound barrels¹⁶. Typically, 40-pound cheddar blocks are shredded or sliced for retail and food service distributors while 500-pound barrels are processed into cheese sauces, slices, or powders. Some cheddar processors are limited to producing either blocks or barrels. However, market dynamics over the last decade, particularly during COVID-19, have rewarded processors who possess the ability to shift production between blocks and barrels.

Despite consumer preferences shifting steadily towards block cheese consumption over the last decade, processors earlier in the decade ramped up barrel cheese production. From 2012 to 2018, barrel cheese production increased 32% despite prices that were often relatively weak compared to block cheese¹⁷. However, during that period, processors were being incentivized to supply a growing market for whey, the high protein byproduct of cheese production. Whey from barrel cheese commands a premium price to other whey due to its color¹⁸. Surging whey prices helped offset the relatively weaker barrel cheese prices. This dynamic was driven largely by increased

export demand for whey from China, which increased imports from the U.S. by 59% from 2012 to 2017 (Figure 3¹⁹). The U.S.-China trade dispute derailed this trend, though, and exports of U.S. whey declined 22% from 2017 through 2019 due largely to the 60% decline in exports to China. As exports declined, so did whey prices and cheese processors shifted a portion of production to the relatively more profitable cheese blocks.

The Phase One trade agreement between the U.S. and China has revived export demand for U.S. whey. Exports increased 24% yoy in 2020, led by a 114% yoy increase in Chinese purchases²⁰. Whey prices responded by rising a corresponding 26% yoy in December, nearing the most recent peak levels (Figure 4²¹). Cheese processors who can switch from blocks to barrel production may do so to capitalize on the rally in whey exports and prices. The switch also offsets some of the recent weakness in cheese prices.

Outlook

The outlook for the U.S. dairy sector remains mixed. Inventories of dairy products remain elevated and prices volatile entering the new year. In addition, higher feed costs due to surging annual crop prices represent a headwind for dairy profit margins in 2021. However, dairy product prices remain well above the multi-year lows reached in early-2020. We expect strong export demand combined with the rollout of COVID-19 vaccines will accelerate a return to normalcy within dairy supply chains²².

Endnotes

- 1 Dairy Products per Capita Consumption, USDA Economic Research Service, February 2021.
- 2 Dairy Products per Capita Consumption, USDA Economic Research Service, February 2021.
- 3 Total Domestic Dairy Consumption, USDA data accessed via Haver, February 2021.
- 4 U.S. Dairy Exports – Percent of Production 1996-2019, U.S. Dairy Export Council, accessed February 2021.
- 5 U.S. Dairy Exports - Percent of Production , U.S. Dairy Export Council, accessed February 2021..
- 6 Total dairy exports – average 2015-2019, USDA Foreign Agricultural Service, accessed February 2, 2021.
- 7 Cheese exports, USDA Foreign Agricultural Service, accessed February 2, 2021.
- 8 Milk Production report, USDA NASS, data accessed February 2021.
- 9 The Texas Dairy Industry Continues to Grow, Texas A&M AgriLife Extension, March 2020.
- 10 Milk Production report, USDA NASS, data accessed February 2021.
- 11 Dairy Processing Capacity Database, The McCully Group, data as of August 2020.
- 12 Texas Dairy Production Has Shifted From The Northeast To The Panhandle, But Why?, Texas A&M Today, February 6, 2018.
- 13 How to Reduce Heat Stress in Dairy Cattle, University of Missouri Extension, October 1993.
- 14 Weather data queried for Texas Panhandle, NOAA Climate Data Online, accessed February 2021.
- 15 MIM internal estimate, based on enterprise budgets for alternative dairy production regions, February 2021.

Figure 3 | U.S. Whey: Exports to China (MT- thousands)

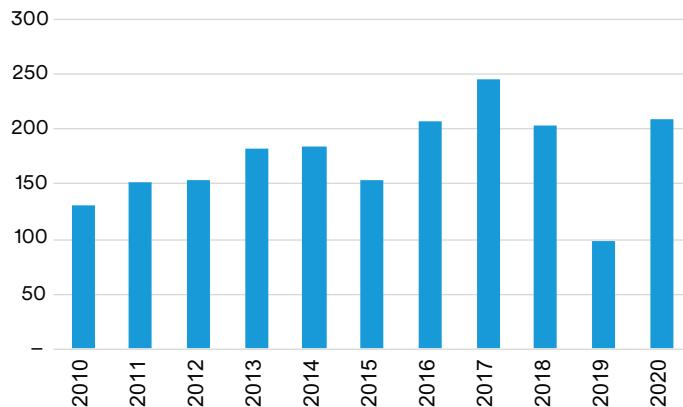
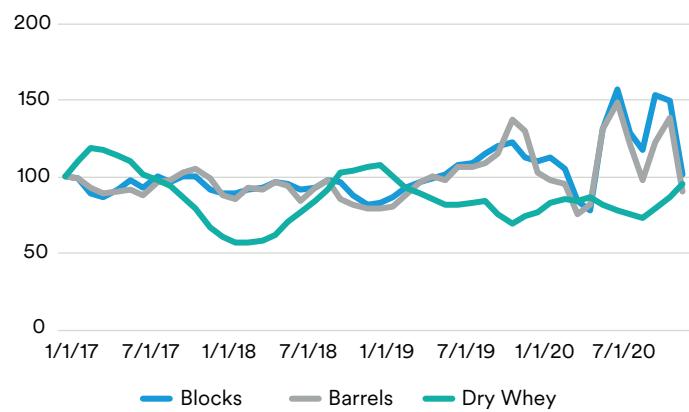


Figure 4 | Dairy Price Index (2017 = 100)



- 16 Annual Values from Dairy Products Productions, USDA data accessed from LMIC, February 2021.
 - 17 Block and Barrel Cheese Sales and Prices, National Dairy Products Sales Report data accessed from LMIC, February 2021.
 - 18 Cheese Prices, Do We Have A Problem?, Farm Bureau, September 4, 2019.
 - 19 Annual exports of U.S. whey, USDA Foreign Agricultural Service, accessed February 3, 2021.
 - 20 Annual exports of U.S. whey, USDA Foreign Agricultural Service, accessed February 3, 2021.
 - 21 MIM Calculation using data from National Dairy Products Sales Report, USDA Agricultural Marketing Service data from LMIC, February 2021.
 - 22 Milk prices rebound after COVID-19 meltdown, AGWEEK, June 18, 2020.
-

Authors



MICHAEL GUNDERSON, PHD
Director, Agricultural Research & Strategy

Michael Gunderson is Director, Head of Agricultural Research & Strategy. He provides leadership to market analysis of annual and permanent agricultural crops, forest and timberland products, and agribusinesses to help drive investment strategy for MetLife Investment Management. In this role, Mike shares market insights regarding agricultural credit conditions, commodity price forecasts, and industry dynamics to support MIM's agricultural portfolio. Mike earned his Ph.D. in Agricultural Economics from Purdue University, an M.S. in Agricultural Economics from Cornell University, and a B.S. in Agribusiness, Farm, and Financial Management from the University of Illinois.



BLAINE NELSON
Associate Director, Agricultural Research & Strategy

Blaine Nelson is an Associate Director on MIM's Agricultural Research & Strategy team and is responsible for market research and investment strategy development in support of the Agricultural Finance Group. In this role, he produces research publications and agricultural forecasts, and monitors various sectors within the agricultural space. Prior to joining MetLife, Nelson worked with The Atkins Group as an Agricultural Analyst. He earned his M.S. in Agricultural and Consumer Economics at the University of Illinois and holds a B.S. in Applied Economics from the University of Minnesota.



TOM KARMEL
Associate Director, Agricultural Research & Strategy

Tom Karmel is an Associate Director on the Agricultural Research & Strategy team. He is responsible for quantitative market analysis to help drive investment strategy for MetLife Investment Management's agricultural platform. In this role, Tom produces market insights, models agricultural credit conditions, and forecasts commodity prices to support MIM's agricultural portfolio. Tom earned his M.S. in Agricultural Economics from Purdue University and completed his B.S. in Meteorology from Florida State University.

Disclosure

This document has been prepared by MetLife Investment Management (“MIM”) solely for informational purposes and does not constitute a recommendation regarding any investments or the provision of any investment advice or the offer or provision of any investment product or service, nor does it constitute or form part of any advertisement of, offer for sale or subscription of, solicitation or invitation of any offer or recommendation to purchase or subscribe for any securities or investment advisory services. The views expressed herein are solely those of MIM and do not necessarily reflect, nor are they necessarily consistent with, the views held by, or the forecasts utilized by, the entities within the MetLife enterprise that provide insurance products, annuities and employee benefit programs. The information and opinions presented or contained in this document are provided as the date it was written. It should be understood that subsequent developments may materially affect the information contained in this document, which none of MIM, its affiliates, advisors or representatives are under an obligation to update, revise or affirm. It is not MIM’s intention to provide, and you may not rely on this document as providing, a recommendation with respect to any particular investment strategy or investment. The information provided herein is neither tax nor legal advice. Investors should speak to their tax professional for specific information regarding their tax situation. Investment involves risk including possible loss of principal. Affiliates of MIM may perform services for, solicit business from, hold long or short positions in, or otherwise be interested in the investments (including derivatives) of any company mentioned herein. This document may contain forward-looking statements, as well as predictions, projections and forecasts of the economy or economic trends of the markets, which are not necessarily indicative of the future. Any or all forward-looking statements, as well as those included in any other material discussed at the presentation, may turn out to be wrong.